IASCL 2008

The XI Congress of the International

Association for the Study of Child Language

Language, cognition, and experience in child language development: Interdisciplinary perspectives on monolingual and bilingual language acquisition

28 July – 1 August 2008

Edinburgh, UK

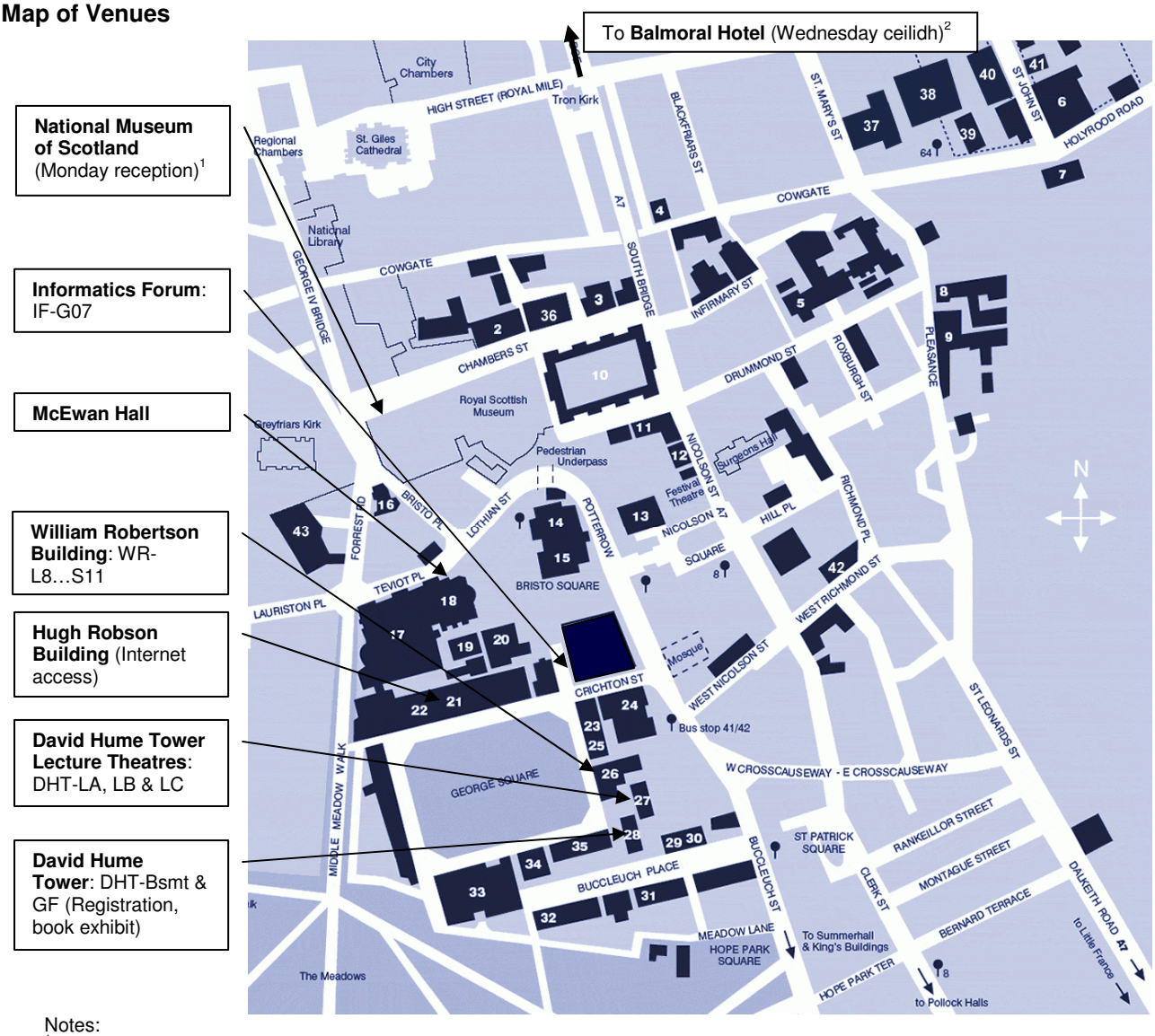
Table of Contents

Finding Your Way Around

Venue Codes

Code	Name	Events and services
McEwan Hall	McEwan Hall	Plenary lectures
DHT-Bsmt	David Hume Tower Basement	Registration (Sun/Mon)
DHT-GF	David Hume Tower Ground Floor	Registration (Tue-), book exhibition, main teas/coffees
DHT-LA	David Hume Tower Lecture Theatre A	Symposia
DHT-LB	David Hume Tower Lecture Theatre B	Symposia
DHT-LC	David Hume Tower Lecture Theatre C	Symposia
IF-G07	Informatics Forum – Room G07	Symposia, business meeting, and special sessions
WR-L8	William Robertson Building – Lecture Theatre 8	Symposia
WR-G02	William Robertson Building – Room G02	Private meetings
WR-G03	William Robertson Building – Room G03	Poster presentations
WR-G04	William Robertson Building – Room G04	Poster presentations
WR-S9	William Robertson Building – Seminar Room 9	Poster presentations
WR-S10	William Robertson Building – Seminar Room 10	Poster presentations
WR-S11	William Robertson Building – Seminar Room 11	Poster presentations

Map of Venues



Notes:
[1] The **National Museum of Scotland** is adjacent to the Royal Museum of Scotland (Please don't confuse them!).
[2] Follow this arrow and cross North Bridge to the **Balmoral Hotel**. You will find it on the left at the corner of North Bridge and Princes Street. Approximately 1km (0.6 mile) from the David Hume Tower Reception Area.

The Conference at a Glance

Please see page 2 for venue codes and map.

Sunday 27 July

14.00 – 17.00	**Registration**	**DHT-Bsmt**

Monday 28 July

07.30 - 18.30	**Registration**				**DHT-Bsmt**
09.00 - 09.15	**Opening Speeches**				**McEwan Hall**
	April McMahon, *Head of the College of Humanities and Social Science, University of Edinburgh*				
09.15 - 10.30	**Plenary Session 1**				**McEwan Hall**
	"Social cognition and early language development in infancy" Andrew Meltzoff, *University of Washington*				
10.30 - 11.00	**Coffee Break**				**DHT-GF, WR**
11.00- 13.00	**Symposium Session 1**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S1-1: *Screening for language delay in preschool children: Experiences and methodological challenges*	S1-2: *Referential communication in preschool children: What conditions make them more adept?*	S1-3: *Foundations for processing events and learning relational terms*	S1-4: *Prosody development: Typical and atypical*	S1-5: *Multilingualism as a norm: Insights from trilingual case studies around the world*
13.00- 14.30	**Lunch Break**				
14.30 - 16.00	**Poster Session 1**				
	WR-G03	**WR-G04**	**WR-S9**	**WR-S10**	**WR-S11**
	P1-1 : P1-6	P1-7 : P1-15	P1-16 : P1-27	P1-28 : P1-39	P1-40 : P1-55
16.00 - 16.30	**Coffee Break**				**DHT-GF, WR**
16.30 - 18.30	**Symposium Session 2**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S2-1: *Language impairment in adolescents: Psycholinguistic, educational and clinical perspectives*	S2-2: *The effect of discourse and pragmatics on referential expression: Cross-linguistic and cross-methodological evidence*	S2-3: *Mastering the intricacies of adjective meaning: Children acquire more than a word-to-property mapping*	S2-4: *Acquisition of intonation: Interfaces with word stress and grammar cross-linguistic evidence*	S2-5: *The origins and development of sociolinguistic competence*
19.00- 21.00	**Welcome reception**				**National Museum of Scotland, Chambers Street**
	Welcome: Antonella Sorace, *University of Edinburgh*				

Tuesday 29 July

08.30 - 18.30	**Registration**				**DHT-GF**
09.15 - 10.30	**Plenary Session 2** **McEwan Hall** "Evolution of the language faculty" Marc Hauser, *Harvard University*				
10.30 - 11.00	**Coffee Break**				**DHT-GF, WR**
11.00- 13.00	**Symposium Session 3**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S3-1: *Predictors, prevalence and natural history of language outcomes in a community cohort of Australian children: The Early Language in Victoria Study*	S3-2: *The acquisition of Bantu verbal morphology: A comparative view*	S3-3: *Pragmatic constraints and resource diversity in caregiver-infant interactions across cultures*	S3-4: *Early representations of prosodic information*	S3-5: *Why are noun plurals hard to acquire? A multi-task approach*
13.00- 14.30	**Lunch Break**				
14.30 - 16.00	**Poster Session 2**				
	WR-G03	**WR-G04**	**WR-S9**	**WR-S10**	**WR-S11**
	P2-1 : P2-6	P2-7 : P2-16	P2-17 : P2-26	P2-28 : P2-36	P2-37 : P2-51
16.00 - 16.30	**Coffee Break**				**DHT-GF, WR**
16.30 - 18.30	**Symposium Session 4**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S4-1: *Lexical and grammatical complexity in typical and atypical school-age children and adolescents*	S4-2: *A comparative study of Mayan children's verb complement forms*	S4-3: *Beyond input: What orally educated deaf children teach us about language development*	S4-4: *Instrumental analysis of child speech*	S4-5: *Statistical approaches to the development of inflectional morphology*

Wednesday 30 July

08.30 - 18.30	**Registration**				**DHT-GF**
9.00- 11.00	**Symposium Session 5**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**DHT-LC**	**IF-G07**
	S5-1: *Language processing and linguistic abilities in Autistic Spectrum Disorder*	S5-2: *Early abstract knowledge of verbs and their morphosyntax*	S5-3: *The role of input variability on language acquisition and use*	S5-4: *Liaison acquisition and construction in French: Empirical tests for a usage-based model*	S5-5: *Constructivist approaches to children's errors*
11.00- 11.30	**Coffee Break**				**DHT-GF, WR**
11.30 - 13.30	**Symposium Session 6**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S6-1: *Understanding linguistic and cognitive deficits in SLI: Insights from neuropsychological research into the impairment*	S6-2: *How do pragmatics and semantics relate to the emergence of articles and pronouns?*	S6-3: *Input factors in bilingual acquisition*	S6-4: *Vowel development in non-Indo-European languages*	S6-5: *Machine learning of language from CHILDES corpora*
13.45- 14.45	**Lunchtime Workshop** - The Phon & PhonBank Initiative within CHILDES				**IF-G07**
14.45-	**Sightseeing Tours** (see p. 10 for details)				
15.00- 17.00	**Special session in honour of Ann Peters** **IF-G07** *Perspectives on the complexity of language acquisition: Conversation, prosody, typology and individual differences*				
19.30- midnight	**Conference Ceilidh (Dancing will begin at 21.30)** **Balmoral Hotel, Princes Street** *Please make your own dinner plans before coming to the Ceilidh.*				

Thursday 31 July

08.30 - 18.30	**Registration**				**DHT-GF**
09.15 - 10.30	**Plenary Session 3** "Opening your ears in a multilingual world" Núria Sebastián-Gálles, *University of Barcelona*				**McEwan Hall**
10.30 - 11.00	**Coffee Break**				**DHT-GF, WR**
11.00- 13.00	**Symposium Session 7**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S7-1: *Individual differences and heterogeneity of the language profile in Williams syndrome*	S7-2: *Intersentential pronominal reference in L1-acquisition*	S7-3: *Why say, the* car green*: Morphosyntactic cross-linguistic transfer in bilingual children*	S7-4: *How phonological development supports lexical development*	S7-5: *Solving the no-negative evidence problem using positive evidence: Data from mathematical, computational, elicited-production and grammaticality-judgement studies*
13.00- 14.30	**Lunch Break** **IASCL Business Meeting**				**IF-G07**
14.30 - 16.00	**Poster Session 3**				
	WR-G03	**WR-G04**	**WR-S9**	**WR-S10**	**WR-S11**
	P3-1 : P3-5	P3-6 : P3-13	P3-14 : P3-24	P3-25 : P3-34	P3-35 : P3-48
16.00 - 16.30	**Coffee Break**				**DHT-GF, WR**
16.30 - 18.30	**Symposium Session 8**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S8-1: *Gesture and language development in children with language impairments*	S8-2: *Acquiring the semantics and syntax of presuppositions*	S8-3: *Investigating the linguistic development of early successive bilinguals*	S8-4: *Crosslinguistic perspectives on word segmentation*	S8-5: *Theory of mind and linguistic development: How they do (and do not) relate*

Friday 1 August

08.30 - 18.30	**Registration**				**DHT-GF**
9.00- 11.00	**Symposium Session 9**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**DHT-LC**	**IF-G07**
	S9-1: *Phonology in Down syndrome: From perception, articulation and cognition to reading*	S9-2: *Detecting null arguments in child language: Comprehension approaches*	S9-3: *The origins and functions of infants' gestures: A harbinger of linguistic development*	S9-4: *Brain indices of speech discrimination in monolinguals and bilinguals: Developmental perspectives*	S9-5: *The role of language components in literacy development: Views from multiple methods*
11.00- 11.30	**Coffee Break**				**DHT-GF, WR**
11.30 – 13.00	**Poster Session 4**				
	WR-G03	**WR-G04**	**WR-S9**	**WR-S10**	**WR-S11**
	P4-1 : P4-7	P4-8 : P4-18	P4-19 : P4-28	P4-29 : P4-38	P4-39 : P4-48
13.00- 14.30	**Lunch Break**				
14.30 - 16.30	**Symposium Session 10**				
	DHT-LA	**DHT-LB**	**DHT-LC**	**WR-L8**	**IF-G07**
	S10-1: *The role of phonological deficits in Specific Language Impairment (SLI) and dyslexia*	S10-2: *Development at the grammar/ pragmatics interface: Implicature, presupposition, focus, quantifier scope, and (over)literal interpretation*	S10-3: *The contribution of gesture to language learning at different linguistic milestones*	S10-4: *From variations to stability in child language: A multimodal and interdisciplinary perspective*	S10-5: *Narrative assessment of preschoolers: Significance and best practices*
16.30- 17.00	**Coffee Break**				**DHT-GF, WR**
17.00- 18.15	**Plenary Session 4** "Nature and nurture in the development of complex language comprehension" Rachel Mayberry*, University of California, San Diego*				**McEwan Hall**
18.15- 18.30	**Final Remarks** Antonella Sorace*, University of Edinburgh*				**McEwan Hall**

Welcome

The IASCL 2008 Organising Committee welcomes you to Edinburgh! This triennial conference, the 11th in an established series, was previously held in Tokyo (1978), Vancouver (1981), Austin (1984), Lund (1987), Budapest (1990), Trieste (1993), Istanbul (1996), San Sebastián (1999), Madison (2002), and Berlin (2005). The IASCL conference - the largest and the most interdisciplinary in the field - brings together researchers from diverse research fields with a common research interest in child language. We are proud to host this major event at our University.

The programme is of the highest calibre: it includes 50 thematic symposia – for a total of 220 oral presentations – and 200 poster presentations. We received a very high volume of submissions: 452 poster abstracts and 99 symposium proposals that included a total of 412 oral presentation abstracts. All 864 proposals were rigorously reviewed by three external referees, selected on the basis of topic area, with respect to different criteria including significance to the field, originality, coherence, methodology, and presentation. The final selection was an extremely difficult task. We owe a special debt to the external reviewers for graciously undertaking to evaluate a greater number of abstracts than we had anticipated.

IASCL 2008 has been organised by members of staff of the department of Linguistics and English Language at the University of Edinburgh, with the professional assistance of In Conference Ltd. We are grateful to all our sponsors that contributed to making the conference possible. In particular, we would like to acknowledge the generous contribution of the International Association for the Study of Child Language that has made its funds available to support the attendance of 24 students. We also appreciate the support of the Linguistic Association of Great Britain, which has made it possible to increase the number of studentships. The organisation of the conference was greatly enhanced in its final stages by the help of postgraduate students at the University of Edinburgh. Finally, we thank the authors of all the submitted abstracts for their contribution to the conference and for enhancing the quality of the programme.

July 2008

The IASCL 2008 Organising Committee

Antonella Sorace, University of Edinburgh
Mits Ota, University of Edinburgh
Barbora Skarabela, University of Edinburgh

Professional Conference Organisation

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Acknowledgements

Sponsors

The organisers gratefully acknowledge financial support from the following sponsors:

Cambridge University Press
The Human Communication Research Centre (HCRC)
Informa UK/ Psychology Press
International Association for the Study of Child Language
John Benjamins Publishers
The Linguistic Association of Great Britain
Multilingual Matters
Oxford University Press
The School of Informatics, University of Edinburgh

IASCL Student Awards

We would like to acknowledge the generous contribution of the Association who has made its funds available to support the attendance of 24 students. We also appreciate the generous contribution of the Linguistic Association of Great Britain for their sponsorship of two student attendees.

Sevda Bahtiyar	Queen's University
Violeta Raluca Barac	York University
Rosa Patricia Barcenas	Universidad Autónoma de Querétaro
Kelly Bridges	Florida Atlantic University
Carolyn Brockmeyer	Lehigh University
Chun Kau Chu	Chinese University of Hong Kong
Ozlem Ece Demir	University of Chicago
Olga Frolova	St-Petersburg State University
Tilbe Goksun	Temple University
Aviya Hacohen	Ben-Gurion University of the Negev
Tanja Heizmann	University of Massachusetts, Amherst
Carolina Holtheuer	Australian National University
Mary Hughes	Boston University
Margaret Dea Hunsicker	University of Chicago
Tatjana Ilic	University of Hawaii at Manoa
Monica-Alexandrina Irimia	University of Toronto
Hyun-ju Kim	Stony Brook University
Pei-Jung Kuo	University of Connecticut
Ronit Levie	Tel Aviv University
Margarita Martinez	Centro de Investigación y Estudios Superiores en Antropología Social (CIESAS, Mexico)
Naymé D Salas	University of Barcelona
Nola Stephens	Stanford University
Saime Tek	University of Connecticut
Ting Xu	Tsinghua University
Deniz Yilmaz	Bilgi University
Yan Yu	Graduate Center, City University of New York

Abstract Reviewers

The organisers would like to thank the following reviewers who read and rated the abstract submissions. Their time and effort to carefully evaluate each abstract was greatly appreciated.

Nameera Akhtar
Ayhan Aksu-Koç
Katherine Alcock
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Katsura Aoyama
Jessica Barlow
Edith Bavin
Heike Behrens
Gerard Bol
Laura Bosch
Nancy Budwig
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General Information

Registration

The registration desks can be found in **the basement of the David Hume Tower** (DHT-Bsmt) on Sunday and Monday (27 & 28 July), and on **the ground floor** (DHT-GF) on the remaining days of the conference.

Registration & Information Desk Opening Hours

Sunday 27 July	14.00 – 17.00	DHT-Bsmt
Monday 28 July	07.30 – 18.30	DHT-Bsmt
Tuesday 29 July	08.30 – 18.30	DHT-GF
Wednesday 30 July	08.30 – 13.30	DHT-GF
Thursday 31 July	08.30 – 18.30	DHT-GF
Friday 1 August	08.30 – 18.30	DHT-GF

If you wish to contact the conference agency during these times, please call +44 (0)7967872529.

Pre-Registered Delegates
Are entitled to:

- Attendance at parallel sessions, plenary lectures, poster sessions and the exhibition area
- Delegate bag, name badge and all conference material
- Morning and afternoon refreshment breaks as published in the programme
- Invitation to the Welcome Reception at the National Museum of Scotland (if pre-booked)
- Invitation to the Conference Ceilidh at the Balmoral Hotel (if pre-booked). Please note that you should make your own dinner plans prior to arriving at the hotel as no food will be available (see Social Programme Section below for further details).

Refreshment and Lunch Arrangements

Tea and coffee
Tea and coffee will be served during coffee breaks in the David Hume Tower and the William Robertson Building. Helpers will be onsite to direct you to the various serving points.

Lunch
Please note that lunch **is not** provided at this conference. A list of local bars and restaurants is included in the delegate bags.

However, **a brown-bag lunch option** for £3.20 is available for Wednesday (lunchtime workshop on Phon) and Thursday (IASCL business meeting during lunch time). Each lunch bag will include a choice of one of three home-made panini sandwiches, prepared with fresh and high quality ingredients, and a bottle of water. All sandwiches will be delivered between 12.30 and 1.00 PM to the ground floor of the Informatics Forum (IF) Building.

- Menu 1: Parma ham, mozarella and rocket
- Menu 2: Artichokes and sun-dried tomatoes with chilli and home-made olive paté
- Menu 3: Scottish smoked salmon and mascarpone cream

Those who are interested in this option **need to sign up** at the registration desk **by Monday 4.00 PM**. Please be prepared to **pay in cash £3.20** when placing your order.

Location of Lecture Theatres

The plenary sessions will be held in the McEwan Hall. Special sessions will be held in G-07 of the Informatics Forum. All symposia and poster sessions will be held in various venues around George Square in the central university area. Please check the map on page 2 for further details.

Social Programme

Welcome Reception at the National Museum of Scotland, Chambers Street
Monday 28 July: 19.00-21.00

The Welcome Reception will be held in Hawthornden Court and the adjoining Kingdom of the Scots Gallery at the National Museum of Scotland. The gallery covers the period when Scotland evolved as a nation, becoming a recognised independent state and a force in Europe and offers guests a wonderful opportunity to explore Scotland's fascinating past. Drinks and canapés will be served.

Conference Ceilidh at the Balmoral Hotel, Princes Street
Wednesday 30 July: 19.30 – Midnight

There will be a ceilidh (pronounced *kay-lee*) band providing the music and a “caller” will be on hand to guide you through the traditional Scottish dances. There will also be a disco to keep you dancing. Get there early to see a demonstration on how the dances should be performed by professional Highland Dancers. The setting couldn’t be more fantastic: the Sir Walter Scott Suite in the Balmoral Hotel has the best views across the city towards Edinburgh Castle. A cash bar will be provided throughout the evening.

Please note that no food will be provided and you should make your own dinner plans. The dancing will begin at 21.30 and a cash bar will be open until 23.45.

Sightseeing Tours

Tickets must be pre-booked before arriving at the conference. There may be the possibility of places still being available when you arrive in Edinburgh. Please check with the Conference Registration Desk in David Hume Tower Reception area.

Edinburgh City Tour by Coach – Wednesday 30 July, 14.45 – 17.00	*Price per Person: £39.00*
Malt Whisky Tour – Wednesday 30 July, 14.45 – 17.00	*Price per Person: £39.00*
Edinburgh Old Town Walking Tour – Wednesday 30 July, 14.45 – 16.30	*Price per Person: £30.00*

All tours will leave from outside the conference venue. Please ensure that you are ready for 14.45

Publishers' Exhibition

We would urge you to take time to attend the book exhibit at this year's conference. The exhibitors will be located on **the ground floor of the David Hume Tower** (DHT-GF).

Monday 28 July	13.00 – 18.00
Tuesday 29 July	10.30 – 18.00
Wednesday 30 July	11.00 – 13.30
Thursday 31 July	10.30 – 18.00
Friday 1 August	11.00 – 17.00

Business Meeting

An IASCL Business Meeting will take place at 13.00 on Thursday July 31 in Room G-07 of the Informatics Forum. This meeting is open to all IASCL members, who are strongly encouraged to attend. A brown bag lunch can be ordered beforehand (see page 9 for details).

Internet Access

Internet Access will be available through free wireless connection and from a limited number of terminals in a computer lab in the basement of the Hugh Robson Building (see map on page 2). The lab will be open Monday-Friday 09.00-17.00. Anyone wishing to use the wireless service or the computer lab facility must sign up at the Conference Registration Desk.

Symposia Presenters

All lecture theatres are equipped with a Windows XP laptop and data projector. A fixed microphone will be available for presenters, and student helpers will be on hand to assist with roving microphones for question and answer sessions.

If you are using PowerPoint, please bring your presentations on a USB flash drive so that you can run your slides on the Windows machine in the lecture theatre. If you need to use your own laptop, we still advise you to bring your presentation on a flash drive in case of incompatibility problems. Please check your presentations before your session begins.

Mac users: Please bring a VGA adaptor to connect your Mac to the projector as the data projectors on site only have connector leads for Windows machines. Note that there are 4 different kinds of adaptors and it is your responsibility to ensure that you have brought the correct one for your particular model of Mac.

Poster Presenters

Authors are requested to put up their poster at the following times. Please note that any posters which have not been removed by the stated time on the day of your poster session may be destroyed.

Poster session	Date and time of session	Set up hours	Remove by
Session 1: P1-1 – P1-55	Monday 28 July 14.30 – 16.00	13.00 – 14.30	16.30
Session 2: P2-1 – P2-51	Tuesday 29 July 14.30 – 16.00	8.30 – 14.30	16.30
Session 3: P3-1 – P3-48	Thursday 31 July 14.30 – 16.00	8.30 – 14.30	16.30
Session 4: P4-1 – P4-48	Friday 1 August 11.30 – 13.00	8.30 – 11.30	14.30

Conference Etiquette

Mobile phones should be switched off or placed on 'silent' during sessions. Please also respect speakers and other delegates and refrain from talking during presentations.

Insurance

The conference cannot accept any liability for personal injuries or for loss or damage to property belonging to delegates either during or as a result of the meeting.

Plenary Talks

Plenary Talk 1 – Monday 28 July, 9.15-10.30, McEwan Hall

Social cognition and early language development in infancy

Andrew Meltzoff (University of Washington)

Recent scientific discoveries have forced revisions to Piaget's theory of sensorimotor development and its connection to language development. One area in which there has been the most radical change is that of 'social cognition.' We now know that human infants are born with the ability to connect socially to other people: At early ages they *imitate* the behaviors of others, process others' *intentions*, and follow the direction of their *attention* (gaze following). Such advanced social cognition, in turn, helps infants to progress in language acquisition in ways that neither Piaget nor Chomsky might have predicted. In this talk I will discuss the special role that live social interaction (vs. seeing people on TV) plays in early language development. As we will see, people are processed in special ways by young infants, with implications for language development and the early foundations of theory of mind.

Plenary Talk 2 – Tuesday 29 July, 9.15-10.30, McEwan Hall

The evolution of the language faculty: The essential role of interfaces

Marc D. Hauser (Harvard University)

Chomsky's view of the faculty of language is that it consists of three core components and their interfaces: phonological, semantic and syntactic. An important goal for those with an evolutionary bent is to determine whether these components evolved for language or for some other domain of knowledge. One approach to addressing this problem is to look at nonhuman animals, exploring not only whether they deploy these processes in the service of communication, but in other functional problems as well. In this talk, I focus on the computational resources that might underlie our grammatical abilities, presenting data from field and laboratory experiments on nonhuman primates that mirror those carried out with human infants. In particular, I show that animals share with humans some of the core conceptual resources, including concepts previously believed to be uniquely linguistic (e.g., singular-plural distinction). However, when humans uniquely evolved syntactic structures, such computations transformed the semantic space by means of critical interface conditions.

Plenary Talk 3 – Thursday 31 July, 9.15-10.30, McEwan Hall

Opening your ears in a multilingual world

Núria Sebastián-Gálles (University of Barcelona)

In the past few years, an increasing number of scholars are directing their efforts to describe and understand how infants growing up in a bilingual environment manage to learn the two language systems. Although the number of studies is still scarce, commonalities and differences with monolingual language acquisition are uncovered. These findings need to be integrated in what is known about the general mechanisms driving language and cognitive development. The early steps of bilingual language acquisition will be reviewed in this talk, in particular studies about early language discrimination, how native phoneme inventory/inventories and building up lexicon/s will be presented. Finally, a bridge will be sketched connecting the early language developmental path and (simultaneous) bilingual adult processing.

Plenary Presentation 4 – Thursday 31 July, 17.00-18.15, McEwan Hall

Nature and nurture in the development of complex language comprehension

Rachel Mayberry (University of California, San Diego)

Much of what we know about language development comes from the ideal circumstance. The infant who hears and overhears language grows up to become the idealized speaker-hearer that scientists model. Sign language research shows the independence of language ability from sensory-motor modality. Crucially, sign language research also reveals how the timing of linguistic exposure in childhood affects the ability to comprehend language in adulthood. Like spoken languages, ASL (American Sign Language) can be acquired in infancy as a first language or after infancy as a second language. Unlike spoken languages, however, ASL is also learned as a first language at ages well past infancy. Here I discuss psycholinguistic and neuroimaging research showing that adult language comprehension is shaped by the onset of language exposure during post-natal brain growth in ways that illuminate the origins of complex language in the individual.

Special Sessions

Special Session 1 – Wednesday 30 July, 13.45-14.45, IF-G07

The Phon & PhonBank Initiative within CHILDES: A Demonstration

Convenors: Yvan Rose (Memorial University of Newfoundland) and Brian MacWhinney (Carnegie Mellon University)

During this special lunchtime presentation, we will provide an introduction to Phon and PhonBank, two new initiatives within the CHILDES project. Phon is a software program with a user-friendly graphical interface that facilitates a number of tasks required for the analysis of phonological development. Phon supports multimedia data linkage, unit segmentation, multiple-blind transcription, automatic labeling of data, and systematic comparisons between target (model) and actual (produced) phonological forms. All of these functions are accessible through a user-friendly graphical interface. Databases managed within Phon can also be queried using a powerful search interface. This software program works on both Mac OS X and Windows platforms, is fully compliant with the CHILDES format, and supports Unicode font encoding. Together, these features facilitate easy data exchange among researchers and the construction of a shared PhonBank database. Phon is being made freely available to the community as open-source software. It meets specific needs related to the study of first language phonological development (including babbling), second language acquisition, and speech disorders. We will explain how Phon can be used to create new corpora and how it can be used in conjunction with other programs such as Praat, CLAN and Excel. We will also discuss future development plans. Finally, we will show how existing corpora of transcribed data can be converted into Phon and contributed to PhonBank, a new section of the CHILDES public database focusing specifically on babbling and phonological development.

Special Session 2 – Wednesday 30 July, 15.00-17.00, IF-G07

A session in honour of Ann Peters

Perspectives on the complexity of language acquisition: Conversation, prosody, typology and invidual differences

Convenor: Edy Veneziano (Université Paris Descartes-CNRS)

Speakers:
Katsura Aoyama (Texas Tech University)
Ruth Berman (Tel Aviv University)
Katherine Demuth (Brown University)
Conxita Lleó (University of Hamburg)
Elena Lieven (Max Planck Institute-EVA, University of Manchester)
Susana Lopez Ornat (Universidad Complutense de Madrid)
Brian MacWhinney (Carnegie Mellon University)
Lise Menn (University of Colorado)
Dan Slobin (University of California, Berkeley)
Magdalena Smoczynska (Jagellonian University)
Edy Veneziano (Université Paris Descartes-CNRS)

Colleagues, collaborators and former students gather to celebrate Ann Peters' seventieth birthday.

Ann Peters' vision has contributed greatly to moving the field away from the assumption that language acquisition is an all-or-none affair. Owing to her detailed child-centered transcriptions and analyses of production, Ann Peters has provided evidence for partial acquisitions undergoing long and individually-varied processes of differentiation and reconstruction. Looking across the boundaries of linguistic notions, such as phonology, morphology, syntax and lexicon, she took seriously those unglossable syllables (called « fillers ») that many children, confronted with different languages, start producing in their late single-word period. She has greatly contributed to research on the development of fillers as a fertile domain for the understanding of how linguistic categories might grow out of an initial intermingling of prosody, phonology and morphosyntax. By imposing only strictly necessary linguistic assumptions on children's production, Ann Peters has made researchers aware of the difficulties involved in identifying linguistic units in early child-speech, an issue that still faces us and heavily conditions the developmental paths of language acquisition that are drawn.

Participants will highlight some leading concepts and empirical work contributed by Ann Peters to the field of language acquisition, and discuss how they resonate with their own past and ongoing research. They will discuss the theoretical impact of Ann Peters' conception of fillers (Demuth, Lleó, MacWhinney, Menn, Veneziano), the important place she has given to individual differences in the way children go about language acquisition (Lieven, Lleó, Smoczynska), the move from all-or-none concepts and categories to transitional and fuzzy phonoprosodic phenomena (Lopez Ornat), the emergence of syntactic forms and the importance of interim strategies in language acquisition (Lieven, Berman), her ideas about phonetic forms (Lieven), early segmentation and prosodic bundling (MacWhinney), and her contribution to transcription and to CHILDES (MacWhinney). Dan Slobin will look at the notion of operating principles, as he and Ann Peters used it, and where it stands today. Katsura Aoyama will reveal the role of Ann Peters as a teacher and advisor, while Edy Veneziano will talk about Ann Peters' influence and present involvement in a cross-linguistic project on the emergence of grammaticality that is very much in line with her encompassing approach to language acquisition.

Symposium Programme

Monday 28 July

Symposium Session 1 - Monday 28 July 11.00 - 13.00, DHT- LA
Symposium Number – S1-1 [Abstracts: pp. 49-50]

Chair: Philip Dale, University of New Mexico
Discussant: Donna Thal, San Diego State University

Title: Screening for language delay in preschool children: Experiences and methodological challenges

- **National language screening in Denmark: The development and testing of a new parent and day-care administered instrument**
  Dorthe Bleses, Rune Jørgensen, Kasper Østerholdt Jensen
  University of Southern Denmark

- **The construction and pilot testing of a short CDI-form to be used for screening in Danish children**
  Werner Vach
  University of Southern Denmark

- **Gains and challenges in early screening for language delay: Experiences from screening in Sweden**
  Mårten Eriksson[1], Monica Westerlund[2]
  [1]University of Gävle, [2]Uppsala University Hospital

- **Some useful insights from the Twins Early Development Study (TEDS) for screening projects**
  Philip Dale
  University of New Mexico

Symposium Session 1 - Monday 28 July 11.00 - 13.00, DHT-LB
Symposium Number – S1-2 [Abstracts: pp. 51-52]

Chair: Aylin Küntay, Koç University
Discussant: Sarah Haywood, University of Edinburgh

Title: Referential communication in preschool children: What conditions make them more adept?

- **Using perspective to decipher and detect ambiguous messages**
  Elizabeth Nilsen[1], Susan Graham[2]
  [1]University of Waterloo, [2]University of Calgary

- **Learning to adapt referring expressions to context**
  Danielle Matthews[1], Elena Lieven[2], Michael Tomasello[2]
  [1]University of Manchester, [2]Max Planck Institute for Evolutionary Anthropology

- **Learning to integrate partner's visual perspective in referential language: Age and pragmatic intent play a role**
  Sevda Bahtiyar[1,2], Aylin Küntay[1]
  [1]Koç University, [2]Queen's University

Symposium Session 1 - Monday 28 July 11.00 - 13.00, DHT-LC
Symposium Number – S1-3 [Abstracts: pp. 52-54]

Chair: Tilbe Goksun, Temple University; Shannon Pruden, University of Chicago
Discussant: Letitia Naigles, University of Connecticut

Title: Foundations for processing events and learning relational terms

- **Finding the path: Infants notice path not distance in dynamic displays**
  Sarah Roseberry[1], Kathy Hirsh-Pasek[1], Roberta Golinkoff[2], Shannon Pruden[3]
  [1]Temple University, [2]University of Delaware, [3]University of Chicago

- **Figure and ground: Conceptual primitives for processing events**
  Tilbe Goksun[1], Kathy Hirsh-Pasek[1], Roberta Golinkoff[2]
  [1]Temple University, [2]University of Delaware

- **Spatial semantics and cognition: Containment, support and tight-fit categories**
  Soonja Choi
  San Diego State University

- **How young children prioritize directed motion event components**
  Anna Yocom, Maia Greene-Havas, Laura Wagner
  Ohio State University

Symposium Session 1 - Monday 28 July 11.00 - 13.00, WRB-L8
Symposium Number – S1-4 [Abstracts: pp. 54-57]

Chair: Susan Peppe, Queen Margaret University
Discussant: Brechtje Post, University of Cambridge

Title: Prosody development: Typical and atypical

- **Prosodic traffic lights at the transition to multiword speech**
  Juliette Corrin[1], Bill Wells[2]
  [1]University College London, [2]University of Sheffield

- **Regional accent differences in typical prosodic development**
  Sue Peppe[1], Meriah Kohn[2]
  [1]Queen Margaret University, [2]NHS Borders

- **Atypical prosody in children with Williams syndrome**
  Jane Setter, Vesna Stojanovik
  University of Reading

- **Intonation measures for normal and atypical language acquisition: What can multiple measures tell us?**
  Heather Balog
  Wayne State University

- **Prosody in Swedish children with language impairment**
  Christina Samuelsson
  University of Linkoping

- **Acquisition of morphology guided by pitch: Evidence from Dutch-speaking children with cochlear implant**
  Martine Coene[1,2], Kristin Daemers[3], Paul Govaerts[1,3], Steven Gillis[1], Johan Rooryk[2]
  [1]Universiteit Antwerpen, [2]Universiteit Leiden, [3] The Eargroup, Belgium

Symposium Session 1 - Monday 28 July 11.00 - 13.00, IF-G07
Symposium Number – S1-5 [Abstracts: pp. 57-59]

Chair: Suzanne Quay, International Christian University
Discussant: Anat Stavans, Hebrew University in Jerusalem, Beit Berl Academic College

Title: Multilingualism as a norm: Insights from trilingual case studies around the world

- **The influence of child-directed speech in early trilingualism**
  Julia Barnes
  Mondragon Unibertsitatea, Eskoriatza

- **Trilingual cross-linguistic influence**
  Kerstin Kazzazi
  Katholische Universitaet Eichstaett-Ingolstadt

- **Peer socialization and language dominance in trilingual language acquisition**
  Suzanne Quay
  International Christian University

- **Language differentiation in early trilingual development: Evidence from a case study**
  Simona Montanari
  California State University

Symposium Session 2 - Monday 28 July 16.30 - 18.30, DHT-LA
Symposium Number – S2-1 [Abstracts: pp. 59-61]

Chair: Victoria Joffe, City University
Discussant: Marilyn Nippold, University of Oregon

Title: Language impairment in adolescents: Psycholinguistic, educational and clinical perspectives

- **Profiling the language and cognitive abilities of secondary school-aged students with language impairments: Perspectives from students, parents and teachers**
  Victoria Joffe[1], Francesca Parker[1], Emma Dean[1], Nita Madhani[2], Eleni Kotta[1]
  [1]City University London, [2]Redbridge PCT

- **Morpho-lexical abilities across school years: The effects of language impairment and disadvantaged background**
  Dafna Kaplan, Ronit Levie, Amalia Bar On, Irit Katzenberger, Dorit Ravid
  Tel Aviv University

- **The role of language and literacy as mediators in the educational achievement of pupils with a history of Specific Language Impairment**
  Julie Dockrell[1], Geoff Lindsay[2]
  [1]Institute of Education, University of London, [2]University of Warwick

- **Are specialist schools effective for secondary-aged pupils with language impairments? Language and educational achievements at Moor House School**
  Susan Ebbels
  Moor House School

Symposium Session 2 - Monday 28 July 16.30 - 18.30, DHT-LB
Symposium Number – S2-2 [Abstracts: pp. 61-64]

Chair: Shanley Allen, Boston University; Anne Salazar Orvig, Université Sorbonne Nouvelle
Discussant: Ludovica Serratrice, University of Manchester

Title: The effect of discourse and pragmatics on referential expression: Cross-linguistic and cross-methodological evidence

- **Young children's sensitivity to new and known information in answering questions**
  Dorothe Salomo, Elena Lieven, Michael Tomasello
  Max Planck Institute for Evolutionary Anthropology

- **Speaking and gesturing under discourse constraints in early childhood**
  Wing Chee So[1], Ece Demir[2], Susan Goldin-Meadow[2]
  [1]National University of Singapore, [2]University of Chicago

- **Differences in the use of nouns, third person pronouns, and unmarked reference by young children in dialogue**
  Anne Salazar Orvig[1], Haydee Marcos[2], Aliyah Morgenstern[3], Jocelyne Leber-Marin[1], Jaques Pares[1], Gwendoline Fox[1], Julien Heurdier[1], Stéphane Jullien[1,4]
  [1]Université Sorbonne Nouvelle, [2]Université de Poitiers, [3]Ecole Normale Superieure, [4]Université de Neuchâtel

- **Developmental effects of discourse-pragmatics and social cognition on argument realization: A comparison of child English and child Inuktitut**
  Barbora Skarabela[1], Mary Hughes[2], Shanley Allen[2]
  [1]University of Edinburgh, [2]Boston University

- **Preferred argument structure in bilingual acquisition**
  Sonia Guerriero[1], Yuriko Oshima-Takane[2], Fred Genesee[2], Makiko Hirakawa[3]
  [1]Canadian Council on Learning, [2]McGill University, [3]International Christian University

Symposium Session 2 - Monday 28 July 16.30 - 18.30, DHT-LC
Symposium Number – S2-3 [Abstracts: pp. 64-66]

Chair: Yi Ting Huang, Harvard University
Discussant: Jesse Snedeker, Harvard University

Title: Mastering the intricacies of adjective meaning: Children acquire more than a word-to-property mapping

- **Form-meaning mappings in the acquisition of the semantics of adjectives**
  Kristen Syrett
  Rutgers University

- **Big coins versus big plates: The use of referential contrast in children's on-line interpretation of scalar adjectives**
  Yi Ting Huang, Jesse Snedeker
  Harvard University

- **Do children overuse "estar" or do adults underuse "estar"?**
  Carolina Holtheuer[1], Karen Miller[2], Cristina Schmitt[3]
  [1]Australian National University, [2]Calvin College, [3]Michigan State University

- **Objects, sets, statistics, and the development of compositional rules**
  David Barner
  University of Toronto

Symposium Session 2 - Monday 28 July 16.30 - 18.30, WRB-L8
Symposium Number – S2-4 [Abstracts: pp. 66-68]

Chair: Paula Fikkert, Radboud University
Discussant: Aoju Chen, Max Planck Institute for Psycholinguistics

Title: Acquisition of intonation: Interfaces with word stress and grammar – Cross-linguistic evidence

- **Monolingual and bilingual acquisition of yes-no questions in Spanish and German: Alignment of pitch accents to stressed syllables and beyond**
  Conxita Lleò[1], Martin Rakow[2]
  [1]University of Hamburg, [2]University of Hamburg, Research Center on Multilingualism

- **The intonation of one-word and first two-word utterances in European Portuguese**
  Sónia Frota, Marina Vigário
  University of Lisbon

- **Is prosodic development correlated with grammatical development? Evidence from emerging intonation in Catalan and Spanish**
  Pilar Prieto[1], Ana Estrella[2], Jill Thorson[2], Maria del Mar Vanrell[2]
  [1]ICREA-UAB, [2]UAB

- **The prosodic structure of Dutch one-word utterances: Intonation or word-stress?**
  Paula Fikkert, Aoju Chen
  [1]Radboud University, [2]Max Planck Institute for Psycholinguistics

Symposium Session 2 - Monday 28 July 16.30 - 18.30, IF-G07
Symposium Number – S2-5 [Abstracts: pp. 68-70]

Chair: Laura Wagner, Ohio State University
Discussant: Laura Wagner, Ohio State University

Title: The origins and development of sociolinguistic competence

- **The native language of social cognition**
  Katherine Kinzler
  Harvard University

- **Acquisition of style and register**
  Julie Roberts
  University of Vermont

- **Children's developing comprehension of social register**
  Laura Wagner, Maia Greene-Havas
  Ohio State University

- **How do children handle unfamiliar regional accents?**
  Bill Wells, Samantha Lamb
  University of Sheffield

Tuesday 29 July

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00, DHT-LA
Symposium Number – S3-1 [Abstracts: pp. 70-72]

Chair: Sheena Reilly, Murdoch Children's Research Institute
Discussant: Philip Dale, University of New Mexico; Bruce, Tomblin, University of Iowa

Title: Predictors, prevalence and natural history of language outcomes in a community cohort of Australian children: The Early Language in Victoria Study

- **The early language in Victoria study: A prospective, longitudinal, community study**
  Sheena Reilly[1,2], Edith Bavin[3], Lesley Bretherton[4,2], Patricia Eadie[1], Margot Prior[2], Obioha Ukoumunne[2,1], Melissa Wake[1,4], Joanne Williams[1,2]
  [1]Murdoch Children's Research Institute, Australia, [2]University of Melbourne, [3]La Trobe University, [4]Royal Children's Hospital

- **Identifying language impairment: The challenge**
  Edith Bavin[1], Joanne Williams[2,3], Melissa Wake[2,3], Obioha Ukoumunne[2], Sheena Reilly[2,4], Margot Prior[4], Patricia Eadie[2], Lesley Bretherton[3,4]
  [1]La Trobe University, [2]Murdoch Children's Research Institute, Australia, [3]Royal Children's Hospital, [4]University of Melbourne

- **Predictors of language impairment at 4 years: Data from the early language in Victoria study**
  Patricia Eadie[1], Edith Bavin[2], Lesley Bretherton[3,4], Margot Prior[4], Sheena Reilly[1,4], Obioha Ukoumunne[4,1], Melissa Wake[1,3], Joanne Williams[1,3]
  [1]Murdoch Children's Research Institute, Australia, [2]La Trobe University, [3]Royal Children's Hospital, [4], University of Melbourne

- **The other side of the coin - Predictors of precocious talking at 12 and 24 months and outcomes at 4 years**
  Jemma Skeat[1], Joanne Williams[1,2], Melissa Wake[1,2], Obioha Ukoumunne[3,1], Sheena Reilly[1,3], Margot Prior[3], Patricia Eadie[1], Lesley Bretherton[2,3], Edith Bavin[4]
  [1]Murdoch Children's Research Institute, Australia, [2]Royal Children's Hospital, Melbourne, [3]University of Melbourne, [4]La Trobe University

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00, DHT-LB
Symposium Number – S3-2 [Abstracts: pp. 72-75]

Chair: Kamil Ud Deen, University of Hawaii
Discussant: Cécile De Cat, University of Leeds

Title: The acquisition of Bantu verbal morphology: A comparative view

- **The acquisition of inflectional morphology in Sesotho**
  Katherine Demuth, Alissa Cerny, Dayna Alegria
  Brown University

- **First language acquisition of pre-verbal morphology in Xhosa**
  Sandile Gxilishe[1], Peter de Villiers[2], Jill de Villiers[1]
  [1]University of Cape Town, [2]Smith College

- **Raising the mood: Subject agreement in subjunctives in Nairobi Swahili**
  Kamil Deen
  University of Hawaii

- **On the relationship between causatives and applicatives: Evidence from child Sesotho**
  Jean Crawford, William Snyder
  University of Connecticut

- **The acquisition of the passive in Setswana-speaking children**
  Melissa Bortz, Maggie Tshule
  [1]University of Stellenbosch, [2]University of Witwatersrand

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00, DHT-LC
Symposium Number – S3-3 [Abstracts: pp. 75-77]

Chair: Akira Takada, Kyoto University
Discussant: Akira Takada, Kyoto University

Title: Pragmatic constraints and resource diversity in caregiver-infant interactions across cultures

- **The integration of gaze and pointing in infant/caregiver interaction in two cultures**
  Penelope Brown
  Max Planck Institute for Psycholinguistics

- **Comparing young children's communicative environments in two cultures**
  Sabine Stoll[1], Elena Lieven[1,2]
  [1]Max Planck Institute for Evolutionary Anthropology, [2]University of Manchester

- **Socio-cultural and cognitive factors in the emergence of pointing**
  Ulf Liszkowski
  Max Planck Institute for Psycholinguistics

- **The developmental trajectory of give-and-take activity in caregiver-infant interactions**
  Akira Takada
  Kyoto University

- **Socializing attention to third referents: A look at Tzotzil (Mayan) caregiver-infant interactions in natural and created environments**
  Lourdes de León, Margarita Pérez
  CIESAS

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00, WRB-L8
Symposium Number – S3-4 [Abstracts: pp. 77-79]

Chair: Mitsuhiko Ota, University of Edinburgh
Discussant: Mitsuhiko Ota, University of Edinburgh

Title: Early representations of prosodic information

- **Segmental suprasegment or suprasegmental segment? Tone and its representation in infancy**
  Karen Mattock
  Lancaster University

- **Monolingual and bilingual German/French learning infants' sensitivity to lexical stress**
  Barbara Hoehle[1], Ranka Bijeljac-Babic[2], Josette Serres[2], Birgit Herold[1], Thierry Nazzi[2]
  [1]Potsdam University, [2]CNRS - Université Paris 5

- **Stress is encoded in early lexical representations**
  Suzanne Curtin
  University of Calgary

- **Lexical and phrasal pitch contours in early lexical representations**
  Mitsuhiko Ota[1], Naoto Yamane[2,3], Reiko Mazuka[2,4]
  [1]University of Edinburgh, [2]RIKEN Brain Science Institute, Japan, [3]Tokyo Gakugei University, [4]Duke University

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00, IF-G07
Symposium Number – S3-5 [Abstracts: pp. 79-81]

Chair: Wolfgang Dressler, Austrian Academy of Sciences
Discussant: Wolfgang Dressler, Austrian Academy of Sciences

Title: Why are noun plurals hard to acquire? A multi-task approach

- **Methodology: Stem and suffix structure**
  Dorit Ravid
  Tel Aviv University

- **The classical task: From singular to plural form in Dutch, Danish, Austrian German, and Hebrew**
  Steven Gillis[1], Agnita Souman[1], Inge Molemans[1], Sim Dhollander[1], Katja Rehfeldt[2], Laila Kjaerbaek Hansen[2], Hans Basboell[2], Sabine Laaha[3], Johannes Bertl[3], Wolfgang Dressler[3], Naama Lavie[4], Ronit Levie[4], Dorit Ravid[4]
  [1]Antwerp University, [2]University of Southern Denmark, [3]Austrian Academy of Sciences,[4]Tel Aviv University

- **The lotto game: A cross-sectional experimental task in a play context testing plural formation in Austrian German, Dutch, and Hebrew**
  Sabine Laaha[1], Johannes Bertl[1], Wolfgang Dressler[1], Steven Gillis[2], Ronit Levie[3], Ephratt Raz[3], Dorit Ravid[3]
  [1]Austrian Academy of Sciences, [2]Antwerp University, [3]Tel Aviv University

- **Cross-sectional naturalistic elicitations: Scripts and conversations in Hebrew, Austrian German, and Danish**
  Bracha Nir-Sagiv[1], Helli Zwilling[1], Netta Abugov[1], Dorit Ravid[1], Sabine Laaha[2], Katharina Korecky-Kröll[2], Katja Rehfeldt[3], Laila Kjaerbaek Hansen[3], Hans Basboell[3]
  [1]Tel Aviv University, [2]Austrian Academy of Sciences, [3]University of Southern Denmark

- **Longitudinal child speech and child-directed speech: Distributional analyses of noun plurals in Danish, Dutch, Austrian German, and Hebrew**
  Hans Basboell[1], Laila Kjaerbaek Hansen[1], Katja Rehfeldt[1], Agnita Souman[2], Steven Gillis[2], Katharina Korecky-Kröll[3], Laura Lettner[3], Wolfgang Dressler[3], Ronit Levie[4], Ephratt Raz[4], Dorit Ravid[4]
  [1]University of Southern Denmark, [2]Antwerp University, [3]Austrian Academy of Sciences, [4]Tel Aviv University

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30, DHT-LA
Symposium Number – S4-1 [Abstracts: pp. 81-83]

Chair: Marilyn Nippold, University of Oregon
Discussant: Marilyn Nippold, University of Oregon

Title: Lexical and grammatical complexity in typical and atypical school-age children and adolescents

- **Capturing sentential complexity in naturalistic discourse of children 9 to 12: Comparisons of fine-grained and global measures**
  Cheryl Scott
  Rush University Medical Center

- **Derivational morphology and lexical knowledge in the development of the literate Hebrew lexicon**
  Dorit Ravid, Ronit Levie, Galit Avivi Ben Zvi
  Tel Aviv University

- **Explaining the game of chess: Does knowledge drive linguistic complexity?**
  Marilyn Nippold, Dean Vanderbush
  University of Oregon

- **Language in older children and adolescents with Language Impairment**
  Judy Reilly[1,3], Liliana Tolchinsky[2], Beverly Wulfeck[1]
  [1]San Diego State University, [2]University of Barcelona, [3]Université de CNRS-CERCA

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30, DHT-LB
Symposium Number – S4-2 [Abstracts: pp. 83-86]

Chair: Clifton Pye, University of Kansas
Discussant: Clifton Pye, University of Kansas

Title: A comparative study of Mayan children's verb complement forms

- **Introduction to the Mayan verb complex**
  B. Flor Canche Teh
  Universidad Nacional Autónoma de México

- **The acquisition of Mayan aspect**
  Barbara Blaha Pfeiler
  Universidad Nacional Autónoma de México

- **The acquisition of Mayan agreement**
  Carlos Carrillo Carreón
  Universidad Autónoma de Yucatán

- **The acquisition of Mayan status**
  Pedro Mateo
  University of Kansas

- **Summary and theoretical implications**
  Clifton Pye
  University of Kansas

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30, DHT-LC
Symposium Number – S4-3 [Abstracts: pp. 86-87]

Chair: Sarah Van Deusen Phillips, University of Chicago
Discussant: Marie Coppola, University of Chicago

Title: Beyond input: What orally educated deaf children teach us about language development

- **A mother's hand: Maternal gesture and lexical acquisition in Spanish deaf children**
  Sarah Van Deusen Phillips
  University of Chicago

- **Descriptive hands: Noun phrase development in homesign**
  Dea Hunsicker
  University of Chicago

- **Negation in American homesign systems**
  Amy Franklin
  Rice University

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30, WRB-L8
Symposium Number – S4-4 [Abstracts: pp. 88-90]

Chair: James Scobbie, Queen Margaret University
Discussant: Fransisco Lacerda, Stockholm University

Title: Instrumental analysis of child speech

- **Acquisition and loss: An articulatory sociophonetic investigation of postvocalic /r/ in young Scottish speakers**
  James Scobbie[1], Eleanor Lawson[1], Jane Stuart-Smith[2]
  [1]Queen Margaret University, [2]Glasgow University

- **Aspiration or breathy voice? – Speech development beyond adult perceptual boundaries**
  Fredrik Karlsson
  Umea University

- **Articulatory variability in typically developing (TD) children: EPG analysis of fricatives**
  Claire Timmins[1], Joanne McCann[1], William Hardcastle[1], Sara Wood[1], Jennifer Wishart[2]
  [1]Queen Margaret University, [2]Edinburgh University

- **Development of a language-specific vowel quality: Evidence from Swedish**
  Felix Schaeffler
  Queen Margaret University

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30, IF-G07
Symposium Number – S4-5 [Abstracts: pp. 90-92]

Chair: Gert Westermann, Oxford Brookes University
Discussant: Andrea Krott, University of Birmingham

Title: Statistical approaches to the development of inflectional morphology

- **Discovering morphology: The inflection of verbs between two and four years**
  Anna Theakston, Danielle Matthews
  University of Manchester

- **Dissociating easy and hard verbs in the development of the English past tense**
  Gert Westermann[1], Vanja Kovic[1,2]
  [1]Oxford Brookes University, [2]Oxford University

- **Knowing two languages affects children's past-tense production**
  Jianhui Song, Elena Nicoladis
  University of Alberta

- **Acquiring German inflections: Not dual but multiple mechanisms**
  Barbara Stumper, Gisela Szagun
  University of Oldenburg

Wednesday, 30 July

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00, DHT-LA
Symposium Number – S5-1 [Abstracts: pp. 92-94]

Chair: Sarah Haywood, University of Edinburgh
Discussant: Melissa Preissler, University of Lancaster

Title: Language processing and linguistic abilities in Autistic Spectrum Disorder

- **Language abilities in ASD: Evidence from an epidemiological sample**
  Tom Loucas[1], Gillian Baird[6], Tony Charman[2], Andrew Pickles[3], Emily Simonoff[4], Susie Chandler[2], David Meldrum[5]
  [1]University of Reading, [2]University College London, Institute of Child Health, [3]University of Manchester, [4]Kings College London, [5]Chatswood Assessment Centre, [6]Guy's Hospital, United Kingdom

- **Cues to word learning in Autistic Spectrum Disorders**
  Courtenay Frazier Norbury[1,2], Helen Griffiths[1], Kate Nation[1], Sara Hansford[2]
  [1]University of Oxford, [2]Royal Holloway, University of London

- **The use of linguistic context in autism**
  Kate Plaisted
  University of Cambridge

- **Syntactic priming in children with ASD**
  Melissa Allen Preissler[1], Sarah Haywood[2], Holly Branigan[2], Gnanathusharan Rajendran[3]
  [1]University of Lancaster [2]University of Edinburgh, [3]University of Strathclyde

- **The shape bias: Investigations of word learning with children with autism**
  Saime Tek, Gul Jaffery, Deborah Fein, Letitia Naigles
  University of Connecticut

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00, DHT-LB
Symposium Number – S5-2 [Abstracts: pp. 94-96]

Chair: Geraldine Legendre, Johns Hopkins University
Discussant: Letitia Naigles, University of Connecticut

Title: Early abstract knowledge of verbs and their morphosyntax

- **Toddlers' understanding of English discontinuous verbal dependencies**
  Sarah Pope, Amanda Seidl, George Hollich, Lisa Goffman, Rob Kail, Larry Leonard
  Purdue University

- **The nature of first word combinations: Evidence from the sensitivity to subject-verb agreement in 24-month-olds acquiring French**
  Geraldine Legendre[1], Isabelle Barriere[2], Louise Goyet[3], Thierry Nazzi[3]
  [1]Johns Hopkins University, [2]Yeled v' Yalda Research Institute, [3]Université Paris Descartes

- **Sensitivity to verb morphology by German toddlers: Evidence from eye-tracking**
  Oda-Christina Brandt, Barbara Hoehle
  University of Potsdam

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00, DHT-LC
Symposium Number – S5-3 [Abstracts: pp. 96-99]

Chair: Amanda Owen, University of Iowa
Discussant: Amanda Owen, University of Iowa

Title: The role of input variability on language acquisition and use

- **Phonological variability and word learning: Infants can learn lexical neighbors**
  Gwyneth Rost[1], Bob McMurray[2,3]
  [1]University of Iowa, [2] Iowa Center for Development & Learning Sciences

- **Input variability and the Shape Bias: It matters what statistics you get and when you get them**
  Larissa Samuelson[1,2]
  [1]University of Iowa, [2] Iowa Center for Development & Learning Sciences

- **The role of input frequency on children's acquisition of a novel construction: Differences between typically developing children and children with language impairment**
  Vicki Samelson[1], Amanda Owen[1,2]
  [1]University of Iowa, [2]Iowa Center for Development & Learning Sciences

- **The effect of variability in learning nonadjacent dependencies in typically-developing individuals and individuals with language impairments**
  Hsin-Jen Hsu[1], J. Bruce Tomblin[1,2]
  1University of Iowa, [2]Iowa Center for Development & Learning Sciences

- **Clicking a high-variability path to language learning: Tracing the trajectory of nonadjacent dependency learning**
  Jennifer Misyak, Morten Christiansen
  Cornell University

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00, WRB-L8
Symposium Number – S5-4 [Abstracts: pp. 99-100]

Chair: Jean-Pierre Chevrot, Laboratoire Lidilem
Discussant: Elsa Spinelli, UMR Psychologie et NeuroCognition

Title: Liaison acquisition and construction in French: Empirical tests for a usage-based model

- **Acquisition of liaison between determiner and noun: A usage-based model**
  Céline Dugua
  Laboratoire CORAL

- **Can the usage-based model of liaison acquisition account for the social differences which appear (and sometimes disappear) between 2 and 6 years of age? The case of obligatory and optional liaisons**
  Aurélie Nardy, Stéphanie Barbu
  [1]Laboratoire Lidilem, [2]UMR Ethologie Evolution Ecologie

- **Acquisition of liaison: The test of the clitic-verb sequences**
  Sophie Gallot[1,2], Elsa Spinelli[1], Jean-Pierre Chevrot[2]
  [1]UMR Psychologie et NeuroCognition, [2]Laboratoire Lidilem

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00, IF-G07
Symposium Number – S5-5 [Abstracts: pp. 100-103]

Chair: Anna Theakston, University of Manchester
Discussant: Elena Lieven, Max Planck Institute for Evolutionary Anthropology

Title: Constructivist approaches to children's errors

- **Simulating sentence-internal omission errors in MOSAIC using a syllable-based representation**
  Daniel Freudenthal[1], Julian Pine[1], Fernand Gobet[2]
  [1]University of Liverpool, [2]Brunel University

- **The role of the input in explaining English-speaking children's pronominal case errors**
  Minna Kirjavainen, Anna Theakston
  University of Manchester

- **Testing an exemplar-based theory of question acquisition**
  Sarah Fletcher, Caroline Rowland, Ben Ambridge
  University of Liverpool

- **Errors in questions with long-distance dependencies**
  Ewa Dabrowska
  University of Sheffield

- **Sex differences in past tense overregularization errors**
  Evan Kidd, Jarrad Lum
  [1]University of Manchester, [2]Deakin University

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30, DHT-LA
Symposium Number – S6-1 [Abstracts: pp. 103-104]

Chair: Stefano Vicari, Ospedale Pediatrico Bambino Gesù
Discussant: Jarrad Lum, Deakin University

Title: Understanding linguistic and cognitive deficits in SLI: Insights from neuropsychological research into the impairment

- **Interhemispheric interaction in children with SLI: The role of the corpus callosum in generalised processing deficits**
  Jarrad Lum
  Deakin University

- **Are SLI children at risk of literacy problems in a language with transparent orthography? A study on Italian SLI in adolescence**
  Daniela Brizzolara[1], Anna Maria Chilosi[2], Filippo Gasperini[1,2], Pierluigi Zoccolotti[3,4]
  [1]Università di Pisa, [2]IRCCS Fondazione Stella Maris, [3]Università di Roma la Sapienza, [4]IRCCS Fondazione Santa Lucia

- **How specific is SLI?: New neuropsychological data**
  Stefano Vicari, Deny Menghini, Francesca Addona
  [1]Ospedale Pediatrico Bambino Gesù, [2]LUMSA

- **Memory and the English past tense: One or two mechanisms?**
  Evan Kidd
  University of Manchester

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30, DHT-LB
Symposium Number – S6-2 [Abstracts: pp. 104-106]

Chair: Tanja Kupisch, McGill University
Discussant: Cécile de Cat, University of Leeds

Title: How do pragmatics and semantics relate to the emergence of articles and pronouns?

- **The role of phonological and morphological factors in the acquisition of articles and pronouns in a north Norwegian dialect**
  Merete Anderssen
  University of Tromsø

- **Articles and clitic pronouns in the acquisition of Italian and Spanish**
  Neal Snape[1], Tanja Kupisch[2]
  [1]Hokkaido University, [2]McGill University

- **French children's sensitivity to pragmatic aspects in article and pronoun use**
  Anne Baker, Margot Rozendaal
  University of Amsterdam

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30, DHT-LC
Symposium Number – S6-3 [Abstracts: pp. 106-108]

Chair: Johanne Paradis, University of Alberta
Discussant: Elena Nicoladis, University of Alberta

Title: Input factors in bilingual acquisition

- **Relationship between amount of language exposure and language scores in older preschool children acquiring French and English simultaneously**
  Elin Thordardottir
  McGill University

- **How input factors differentially influence bilingual lexical and grammatical acquisition**
  Johanne Paradis[1], Antoine Tremblay[1], Martha Crago[2]
  [1]University of Alberta, [2]Université de Montréal

- **Input, linguistic complexity and cognition: An interactive model of bilingual development**
  Virginia Mueller Gathercole
  University of Wales

- **Qualitative issues in bilingual children's minority language input**
  Barbara Zurer Pearson[1], D. Kimborough Oller[2], Todd Gibson[2], Rosanna Resende[3]
  [1]University of Massachusetts, [2]University of Memphis, [3]University of Miami

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30, WRB-L8
Symposium Number – S6-4 [Abstracts: pp. 108-109]

Chair: B May Bernhardt, University of British Columbia
Discussant: B May Bernhardt, University of British Columbia

Title: Vowel development in non-Indo-European languages

- **Modelling vowels to young children: Data from Hungarian-speaking dyads**
  Krisztina Zajdo
  University of Wyoming

- **A comparison of vowel development in Korean and English-speaking children**
  Soyoung Lee
  University of Wisconsin

- **Vowel acquisition in Valley Zapotec**
  Joseph Stemberger, Mario Chavez-Peon
  University of British Columbia

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30, IF-G07
Symposium Number – S6-5 [Abstracts: pp. 109-112]

Chair: Brian MacWhinney, Carnegie Mellon University
Discussant: Brian MacWhinney, Carnegie Mellon University

Title: Machine learning of language from CHILDES corpora

- **Self-organized learning of the lexicon from CHILDES input**
  Ping Li[1], Brian MacWhinney[2]
  [1]University of Richmond, [2]Carnegie Mellon University

- **Learning to use language in context: New models, new data**
  Deb Roy
  MIT

- **Simulating the developmental pattern of finiteness marking in Dutch, English, Spanish and German using MOSAIC**
  Julian Pine[1], Daniel Freudentral[1], Fernand Gobet[2]
  [1]University of Liverpool, [2]Brunel University

- **A scalable computational approach to grammar discovery from CHILDES data**
  Shimon Edelman[1], Ben Sandbank[2], Jonathan Berant[2], Peter Brodsky[1], Heidi Waterfall[1], Eytan Ruppin[2]
  [1]Cornell University, [2]Tel-Aviv University

- **Bayesian inference of structural dependency**
  Amy Perfors[1], Joshua Tenenbaum[1], Terry Regier[2]
  [1]MIT, [2]University of Chicago

Thursday, 31 July

Symposium Session 7 - Thursday 31 July 11.00 - 13.00, DHT-LA
Symposium Number – S7-1 [Abstracts: pp. 112-114]

Chair: Agnès Lacroix, Laboratoire LMDC (CNRS UMR 6215)
Discussant: Agnès Lacroix, Laboratoire LMDC (CNRS UMR 6215)

Title: Individual differences and heterogeneity of the language profile in Williams syndrome

- **Profiling the language abilities of individuals with Williams Syndrome**
  Spyridoula Varlokosta[1], Victoria Joffe[2]
  [1]University of the Aegean, [2]City University

- **Grammatical abilities in Williams syndrome: Individual differences and their sources**
  Ágnes Lukács[1,2], Csaba Pléh[1], Mihály Racsmány[1,3]
  [1]Budapest University of Technology, [2]Hungarian Academy of Sciences, [3]University of Szeged

- **In search of grammatical and narrative correlates of spatial cognition deficits in Williams syndrome**
  Eliseo Diez-Itza, Verónica Martínez, Manuela Miranda, Aránzazu Antón
  Universidad de Oviedo

- **Williams syndrome and heterogeneity of performances in narratives: A cross-cultural perspective**
  Agnès Lacroix[1], Judy Reilly[2,1], Josie Bernicot[1], Ursula Bellugi[3]
  [1]Laboratoire Langage, Mémoire et Développement Cognitif, [2]San Diego State University, [3]Salk Institute for Biological Studies

- **Development of prosodic abilities in children with Williams syndrome**
  Vesna Stojanovik, Jane Setter
  University of Reading

Symposium Session 7 - Thursday 31 July 11.00 - 13.00, DHT-LB
Symposium Number – S7-2 [Abstracts: pp. 114-117]

Chair: Dagmar Bittner, Centre for General Linguistics (ZAS)
Discussant: Natalia Gagarina, Centre for General Linguistics (ZAS)

Title: Intersentential pronominal reference in L1-acquisition

- **Resolution of intersentential pronouns in German, Russian, and Bulgarian**
  Dagmar Bittner, Natalia Gagarina, Milena Kuehnast
  Centre for General Linguistics (ZAS)

- **Verb semantics affects children's pronoun comprehension: Evidence from eye-movements**
  Pirita Pyykkonen[1], Danielle Matthews[2], Juhani Jarvikivi[3]
  [1]University of Edinburgh, [2]University of Manchester, [3]MPI for Psycholinguistics

- **Two-year-old's use of pronouns for different degrees of givenness in discourse**
  Margot Rozendaal, Anne Baker
  Amsterdam Center of Language and Communication

- **Informativeness, cognitive status, and young children's use of pronominal forms in spontaneous conversation**
  Jeanette Gundel, Kaitlin Johnson
  University of Minnesota

- **Acquisition of pronouns in Norwegian: A case study**
  Kaja Borthen
  Norwegian University of Science and Technology

Symposium Session 7 - Thursday 31 July 11.00 - 13.00, DHT-LC
Symposium Number – S7-3 [Abstracts: pp. 117-119]

Chair: Cassandra Foursha-Stevenson, Mount Royal College
Discussant: Fred Genesee, McGill University

Title: Why say, the car green: Morphosyntactic cross-linguistic transfer in bilingual children

- **Morphosyntactic attrition in the L1 of children who are sequential bilinguals**
  Jennifer Austin[1], María Blume[2], Liliana Sánchez[3]
  [1]Rutgers University, [2]University of Texas

- **On the direction of cross-linguistic influence: Plural morphology in unbalanced bilinguals acquiring German and English**
  Tanja Kupisch
  McGill University

- **Thinking for speaking in two languages: Does language-specific conceptualization affect bilingual children's productions?**
  Elena Nicoladis[1], Cassandra Foursha-Stevenson[2]
  [1]University of Alberta, [2]Mount Royal College

- **A multi-factorial account of cross-linguistic influence: The role of typological distance, language of the community and age in the acceptability of subject pronouns in Italian**
  Ludovica Serratrice[1], Antonella Sorace[2], Francesca Filiaci[2]
  [1]University of Manchester, [2]University of Edinburgh

- **Cross-linguistic transfer in young bilingual children's judgments**
  Cassandra Foursha-Stevenson[1], Elena Nicoladis[2]
  [1]Mount Royal College, [2]University of Alberta

Symposium Session 7 - Thursday 31 July 11.00 - 13.00, WRB-L8
Symposium Number – S7-4 [Abstracts: pp. 120-122]

Chair: Erika Hoff, Florida Atlantic University
Discussant: Erika Hoff, Florida Atlantic University

Title: How phonological development supports lexical development

- **The creation of phonological categories and the negotiation of word meanings in early lexical development**
  D. Kimbrough Oller, Heather Ramsdell
  University of Memphis

- **Perceptual and productive sensitivities to native phonology that facilitate language acquisition**
  Nan Ratner
  University of Maryland

- **Lexical acquisition: Effects of phonology**
  Carol Stoel-Gammon, Anna Vogel Sosa
  University of Washington

- **The effect of delayed phonological development on sub-lexical and lexical processing in preschool children**
  Holly Storkel, Jill Hoover, Junko Maikawa
  University of Kansas

- **Relations between phonological memory and expressive vocabulary in the second year**
  Erika Hoff, Cynthia Core, Kelly Bridges
  Florida Atlantic University

Symposium Session 7 - Thursday 31 July 11.00 - 13.00, IF-G07
Symposium Number – S7-5 [Abstracts: pp. 122-124]

Chair: Caroline Rowland, University of Liverpool
Discussant: Brian MacWhinney, Carnegie Mellon University

Title: Solving the no-negative evidence problem using positive evidence: Data from mathematical, computational, elicited-production and grammaticality-judgement studies

- **The no-negative-evidence problem and the inference from absence: A Bayesian approach**
  Ulrike Hahn
  University of Wales

- **Using on-line local generalizations to recover from overgeneralization**
  Morten Christiansen[1], Nick Chater[2]
  [1]Cornell University, [2]University College London

- **Linguistic self-correction in the absence of feedback: A new approach to the no-negative evidence problem**
  Michael Ramscar, Daniel Yarlett
  Stanford University

- **The no-negative evidence problem for argument-structure overgeneralization errors: Why statistical entrenchment is not sufficient**
  Ben Ambridge, Julian Pine, Caroline Rowland
  University of Liverpool

Symposium Session 8 - Thursday 31 July 16.30 - 18.30, DHT-LA
Symposium Number – S8-1 [Abstracts: pp. 124-126]

Chair: Gary Morgan, City University
Discussant: Virginia Volterra, Institute of Cognitive Sciences and Technologies

Title: Gesture and language development in children with language impairments

- **Late talkers' use of gesture and language at 16-months and 6-years of age**
  Donna Thal[1], Marisa Sizemore[2]
  [1]San Diego State University, [2]University of California

- **Gesture, language, and motor skill in children clinically referred for language impairments**
  Barbara Braddock[1], Jana Iverson[2]
  [1]University of Virginia, [2]University of Pittsburgh

- **Putting speech in context with the hands: The role of gestures in Specific Language Impaired children's pragmatic comprehension**
  Liz Kirk, Karen Pine
  University of Hertfordshire

- **How well do children with language impairment produce and understand mime-like gestures?**
  Nicola Botting[1], Nick Riches[2], Gary Morgan[1]
  [1]City University, [2]University of Reading

- **Gestures and words in a naming task: A comparison between children with Down syndrome and typically developing children**
  Maria Cristina Caselli[1], Silvia Stefanini[2], Martina Recchia[1,3]
  [1]National Research Council, [2]University of Parma, [3]University of Rome "La Sapienza"

Symposium Session 8 - Thursday 31 July 16.30 - 18.30, DHT-LB
Symposium Number – S8-2 [Abstracts: pp. 126-129]

Chair: Petra Schulz, University of Frankfurt
Discussant: Ana Pérez-Leroux, University of Toronto

Title: Acquiring the semantics and syntax of presuppositions

- **Asserting and presupposing grammatical number**
  Ana Pérez-Leroux
  University of Toronto

- **Why is it better to treat PL as expressing a presupposition in acquisition?**
  Christina Schmitt[1], Karen Miller[2]
  [1]Michigan State University, [2]Calvin College

- **The role of theory of mind in the acquisition of factivity**
  Petra Schulz, Carolyn Ludwig
  [1]University of Frankfurt, [2]University of Mannheim

- **Factivity under negation: The acquisition of two types of presuppositions**
  Catherine Léger
  University of Texas

- **Children's acquisition of exhaustivity in clefts**
  Tanja Heizmann
  University of Massachusetts

Symposium Session 8 - Thursday 31 July 16.30 - 18.30, DHT-LC
Symposium Number – S8-3 [Abstracts: pp. 129-131]

Chair: Sharon Unsworth, Utrecht University
Discussant: Aafke Hulk, University of Amsterdam

Title: Investigating the linguistic development of early successive bilinguals

- **Morphological development in early child second language acquisition**
  Jürgen Meisel[1,2]
  [1]University of Hamburg, [2]University of Calgary

- **Fine-tuning the differences between double L1 and early L2**
  Ira Gawlitzek, Dieter Thoma, Rosemarie Tracy
  University of Mannheim

- **Verbal inflection, case morphology and the acquisition of sentence structure in early successive bilinguals**
  Monika Rothweiler
  University of Hamburg

- **Is child L2 French like 2L1 or like adult L2?**
  Suzanne Schlyter, Jonas Granfeldt
  Lund University

Symposium Session 8 - Thursday 31 July 16.30 - 18.30, WRB-L8
Symposium Number – S8-4 [Abstracts: pp. 131-133]

Chair: Barbara Hoehle, University of Potsdam; Thierre Nazzi, CNRS-Université Paris Descartes
Discussant: Jurgen Weissenborn, Humboldt University

Title: Crosslinguistic perspectives on word segmentation

- **Vowel harmony as a potential cue for word segmentation: Findings from German and Turkish 6- and 9-month-olds**
  Anja van Kampen[1], Güliz Parmaksiz[2], Barbara Hoehle[1]
  [1]University of Potsdam, [2]Humboldt University

- **Differences in the development of speech segmentation abilities in two French dialects**
  Thierry Nazzi[1], Karima Mersad[1], Galina Iakimova[1], Megha Sundara[2], Linda Polka[3]
  [1]CNRS-Université Paris Descartes, [2]UCLA, [3]McGill University

- **Early word segmentation in Spanish: Monolingual and bilingual data**
  Laura Bosch, Melània Figueras, Marta Ramon Casas
  University of Barcelona

- **Cues from infant-directed speech for word segmentation in Japanese**
  Akiko Hayashi[1], Reiko Mazuka[2,3]
  [1]Tokyo Gakugei University, [2]RIKEN Brain Science Institute, [3]Duke University

Symposium Session 8 - Thursday 31 July 16.30 - 18.30, IF-G07
Symposium Number – S8-5 [Abstracts: pp. 133-134]

Chair: Hannah De Mulder, UiL OTS- Utrecht University
Discussant: Charlie Lewis, Lancaster University

Title: Theory of mind and linguistic development: How they do (and do not) relate

- **Teasing apart the effects of language and executive functioning on the acquisition of implicit and explicit false belief reasoning**
  Peter de Villiers, Katherine Magaziner, Wendy Roman, Kelsey Sunderland
  Smith College

- **Theory of mind and discourse-based interventions: Can language structure-training really improve theory of mind understanding?**
  Manuel Sprung[1], Heidemarie Lohmann[2], Petra Zauner[3], Nina Bauer[3], Hannah De Mulder[4]
  [1]University of Innsbruck, [2]Max Planck Institute for Evolutionary Anthropology, [3]University of Salzburg, [4]Utrecht University

- **Mother and child talk: The relative contributions of syntax, semantics and mental state terms to children's theory of mind**
  Lance Slade
  Roehampton University

Friday 1 August

Symposium Session 9 - Friday 1 August 09.00 - 11.00, DHT-LA
Symposium Number – S9-1 [Abstracts: pp. 135-136]

Chair: Michèle Pettinato, City University London
Discussant: Michèle Pettinato, City University London

Title: Phonology in Down syndrome: From perception, articulation and cognition to reading

- **Speech disorders in Down syndrome: Evidence from electropalatography**
  Sara Wood, Joanne McCann, William Hardcastle, Jennifer Wishart, Claire Timmins
  Queen Margaret University

- **Auditory ERPs to tones and vowels in children with Down syndrome**
  Margriet Groen[1], Paavo Alku[2], Dorothy Bishop[3]
  [1]University of Hamburg, [2]Helsinki University of Technology, [3]University of Oxford

- **Phonological awareness and reading development in children with Down syndrome and children with Specific Language Impairment**
  Glynis Laws
  University of Bristol

- **Early communication and literacy skills in children with Down syndrome: Investigating how children with Down syndrome learn to read**
  Fiona Dalton, Margaret Harris
  Oxford Brookes University

- **The role of phonetics in the prosodic difficulties of children with Down syndrome**
  Michèle Pettinato, Jo Verhoeven
  City University

Symposium Session 9 - Friday 1 August 09.00 - 11.00, DHT-LB
Symposium Number – S9-2 [Abstracts: pp. 137-139]

Chair: Ana Pérez-Leroux, University of Toronto; Theres Gruter, Université de Montréal
Discussant: Theres Grüter, Université de Montréal

Title: Detecting null arguments in child language: Comprehension approaches

- **Working memory and the underlying representation of missing objects in the development of French**
  Theres Grüter[1], Caroline Erdos[2, 3], Fred Genesee[2]
  [1]Université de Montréal, [2]McGill University, [3]Montreal Children's Hospital

- **Pronoun ambiguity resolution: Evidence from L1 Greek children**
  Ianthi Maria Tsimpli[1], Despina Papadopoulou[1], Evangelia Plemmenou[2], Theodore Marinis[3]
  [1]Aristotle University of Thessaloniki, [2]University of Athens, [3]University of Reading

- **An experimental study of children's comprehension of null subject sentences**
  Robyn Orfitelli, Nina Hyams
  University of California Los Angeles

- **Acquisition of clitics in European Portuguese: Data from comprehension**
  Maria Lobo, João Costa
  Universidade Nova de Lisboa

- **Children's interpretation of null objects under the scope of negation**
  Yves Roberge[1], Ana -T. Pérez-Leroux, Mihaela Pirvulescu
  University of Toronto

Symposium Session 9 - Friday 1 August 09.00 - 11.00, DHT-LC
Symposium Number – S9-3 [Abstracts: pp. 140-142]

Chair: Michèle Guidetti, Université Toulouse II
Discussant: Elena Nicoladis, University of Alberta

Title: The origins and functions of infants' gestures: A harbinger of linguistic development

- **From action to pointing at 9-15 months of age: A comparison between two communicative contexts**
  Paola Perucchini[1], Tiziana Aureli[2], Annalisa Palazzo[2]
  [1]University of Roma Tre, [2]University of Chieti-Pescara

- **Assisted imitation: Caregiver gestures cultivate a shared understanding of action that underlies early communicative development and later language learning**
  Patricia Zukow-Goldring
  University of California, Los Angeles

- **Learning to talk in a gesture-rich world: Early communication in Italian vs. American children**
  Jana M. Iverson[1], Olga Capirci[2], Virginia Volterra[2], Susan Goldin-Meadow[3]
  [1]University of Pittsburgh, [2]Institute of Cognitive Science and Technologies, [3]University of Chicago

- **Do babies learn to gesture because they participate in action?**
  Paula Marentette, Elena Nicoladis
  [1]University of Alberta

- **Gestures of apes and pre-linguistic human children: More similar or more different?**
  Simone Pika
  University of Manchester

- **Language, pointing, and actions during mother and child daily routines**
  María José Rodrigo, Mercedes Muñetón
  University of La Laguna

Symposium Session 9 - Friday 1 August 09.00 - 11.00, WRB-L8
Symposium Number – S9-4 [Abstracts: pp. 142-143]

Chair: Valerie Shafer, Graduate Center, City University of New York
Discussant: Richard Schwartz, Graduate Center, City University of New York

Title: Brain indices of speech discrimination in monolinguals and bilinguals: Developmental perspectives

- **Brain indices of speech discrimination in infants and toddlers**
  Yan Yu, Karen Garrido-Nag
  City University of New York

- **Brain indices of speech discrimination in 8-10 year-old children**
  Nancy Vidal[1], Arild Hestvik[2], Hia Datta[1]
  [1]City University of New York, [2]University of Delaware

- **Brain indices of speech discrimination in adults**
  Hia Datta[1], Arild Hestvik[2], Nancy Vidal[1], Miwako Hisagi[3], Carol Tessel[1], Marcin Wroblewski[1]
  [1]City University of New York, [2]University of Delaware, [3]The Massachusetts Institute of Technology

Symposium Session 9 - Friday 1 August 09.00 - 11.00, IF-G07
Symposium Number – S9-5 [Abstracts: pp. 144-146]

Chair: Blanca Schaefer, University of Sheffield
Discussant: Blanca Schaefer, University of Sheffield

Title: The role of language components in literacy development: Views from multiple methods

- **A study of literacy acquisition in Greek: An investigation of the specific contributions of phonological awareness to early reading development in a transparent orthography**
  Dimitra Ioannou, Margaret Snowling, Emma Hayiou-Thomas
  University of York

- **Components of phonological awareness and their predictive power for early literacy development in German-speaking children**
  Silke Fricke[1,2], Blanca Schaefer[1], Joy Stackhouse[1], Marcin Szczerbinski[1], Bill Wells[1], Annette V. Fox-Boyer[2]
  [1]University of Sheffield, [2]University of Applied Sciences Fresenius Idstein

- **The role of phonological and syntactic and semantic awareness in learning to read: Results from a longitudinal and intervention study**
  Kerry Bannister, Nicola Botting, Victoria Joffe
  City University

- **Speech, language and literacy difficulties: What are the links?**
  Julia Carroll, Joanne Myers
  University of Warwick

Symposium Session 10 - Friday 1 August 14.30 - 16.30, DHT-LA
Symposium Number – S10-1 [Abstracts: pp. 146-147]

Chair: Chloe Marshall, University College London
Discussant: Heather van der Lely, University College London

Title: The role of phonological deficits in Specific Language Impairment (SLI) and dyslexia

- **Phonological development in young children at risk of dyslexia and young children with SLI**
  Elise de Bree, Frank Wijnen
  Utrecht University

- **Phonological short-term memory in children with SLI**
  Lisa Archibald
  University of Western Ontario

- **Speech perception and phonology in developmental language and reading impairments: What's the connection?**
  Marc Joanisse[1], Erin Robertson[2]
  [1]University of Western Ontario, [2]Universite du Quebec à Montréal

- **Relationships between phonological and syntactic deficits in older children with SLI and/or dyslexia**
  Chloe Marshall[1,2], Heather van der Lely[1]
  [1]University College London, [2]City University

Symposium Session 10 - Friday 1 August 14.30 - 16.30, DHT-LB
Symposium Number – S10-2 [Abstracts: pp. 147-149]

Chair: Napoleon Katsos, University of Cambridge
Discussant: Richard Breheny, University College London

Title: Development at the grammar/pragmatics interface: Implicature, presupposition, focus, quantifier scope, and (over)literal interpretation

- **A developmental investigation on the effects of scale type and speech-act on the generation of scalar implicatures**
  Napoleon Katsos[1,2], Dorothy Bishop[2]
  [1]University of Cambridge, [2]Oxford Study of Children's Communication Impairments

- **Over-literal interpretation in pragmatic dysfunction**
  Peter Collins, Dorothy Bishop
  Oxford Study of Children's Communication Impairments

- **Presupposition in young children**
  Nausicaa Pouscoulous, Elena Lieven, Michael Tomasello
  Max-Planck-Institute for Evolutionary Anthropology

Symposium Session 10 - Friday 1 August 14.30 - 16.30, DHT-LC
Symposium Number – S10-3 [Abstracts: pp. 149-151]

Chair: Seyda Ozcaliskan, University of Chicago; Jana Iverson, University of Pittsburgh
Discussant: Eve Clark, Stanford University

Title: The contribution of gesture to language learning at different linguistic milestones

- **Sex differences in language first appear in gesture**
  Seyda Ozcaliskan, Susan Goldin-Meadow
  University of Chicago

- **The interplay between speech, gesture, and affect during communicative transition**
  Meaghan Parlade, Jana M. Iverson
  University of Pittsburgh

- **Children's use of gestures in narration: Evidence from three language/culture groups**
  Samuel Navarro[1], Elena Nicoladis[2], Paula Marentette[2]
  [1]University of British Columbia, [2]University of Alberta

- **Gesture selectively predicts language learning**
  Susan Goldin-Meadow, Meredith Rowe
  University of Chicago

Symposium Session 10 - Friday 1 August 14.30 - 16.30, WRB-L8
Symposium Number – S10-4 [Abstracts: pp. 151-153]

Chair: Aliyah Morgenstern, Ecole Normale Supérieure Lettres et Sciences Humaines
Discussant: Dan Slobin, University of California, Berkeley

Title: From variations to stability in child language: A multimodal and interdisciplinary perspective

- **The emergence of stable prosodic formats in adult-child interaction: From complexity to stabilization**
  Christelle Dodane[1], Karine Martel[2]
  [1]Université Paul Valéry, [2]Université de Caen

- **From gesture to word and from gesture to sign: Meaningful variations?**
  Marie Leroy[1], Nini Hoiting[2], Emmanuelle Mathoit[3]
  [1]Université Paris 5, [2]Royal Effatha Guyot Group, [3]Université Lille 3

- **Variability of early phonological processes in French children: Implications for the study of children with SLI**
  Christelle Maillart[1], Christophe Parisse[2], Naomi Yamaguchi[3]
  [1]University of Liège, [2]Institut National de la Santé et de la recherché médicale (INSERM), MoDyCo, CNRS-Paris X University, [3]Paris 3 University – CNRS

- **Children's creative uses of morpho-syntactic 'errors' between one and three: Variations and deviations**
  Martine Sekali[1], Aliyah Morgenstern[2]
  [1]Université Paris X - Nanterre, [2]Ecole Normale Supérieure Lettres et Sciences Humaines - ICAR

Symposium Session 10 - Friday 1 August 14.30 - 16.30, IF-G07
Symposium Number – S10-5 [Abstracts: pp. 154-156]

Chair: Ageliki Nicolopoulou, Lehigh University
Discussant: Kathy Hirsch-Pasek, Temple University

Title: Narrative assessment of preschoolers: Significance and best practices

- **Oral narrative skills and reading ability: Implications for assessment**
  Elaine Reese[1], Alison Sparks[2], Vrinda Kalia[2], Jennifer Long[1], Sebastian Suggate[1], Elizabeth Shaughency[1]
  [1]University of Otago, [2]Clark University

- **Multitasking: The best way to assess preschoolers' narrative competence?**
  Carolyn Brockmeyer[1], Ageliki Nicolopoulou[1], Sarah Thomas[2], Aline de Sa[1], Hande Ilgaz[1]
  [1]Lehigh University, [2]University of Delaware

- **Effectiveness of different methods of narrative elicitation for assessment of comprehension and production**
  Ayhan Aksu-Koc[1,2], Zeynep Kocaoglu[2], Deniz Yilmaz[3]
  [1]Bogazici University, [2]Yeditepe University, [3]Bilgi University

- **Narrative assessment and children's early literacy skills: Cultural and contextual considerations**
  Gigliana Melzi[1], Margaret Caspe[2]
  [1]New York University, [2]Mathematica Policy Research Institute

Poster Programme

Poster Session 1 – Monday 28 July 14.30 - 16.00 [Abstracts: pp. 157-180]

WR-G03

P1-1
Suprasegmental features in babbling: Does early cochlear implantation enable deaf children to babble like hearing children do?
Oydis Hide[1], Steven Gillis[1], Paul Govaerts[1,2]
[1]University of Antwerp [2]The Eargroup, Belgium

P1-2
The acquisition of pronominal relations in Dutch speaking cochlear implanted deaf children
Annemie Verbist[1], Martine Coene[1,2], Steven Gillis[2], Johan Rooryck[1], Paul Govaerts[2,3]
[1]Leiden University, [2] University of Antwerp, [3]The Eargroup, Belgium

P1-3
Extending the linguistic comprehension model to explain pre-lexical and lexical development in children with a cochlear implant
Paola Escudero, Marcel Giezen, Anne Baker
University of Amsterdam

P1-4
Speech sound development in pediatric cochlear implant users who received implants before 29 months of age
Linda Spencer[1], Elizabeth Walker[1,2]
[1]University of Iowa Hospitals and Clinics, [2]University of Iowa

P1-5
The acquisition of morphosyntax in hearing-impaired children
Annemiek Hammer[1], Martine Coene[1,2], Steven Gillis[2], Johan Rooryck[1], Paul Govaerts[2,3]
[1]Leiden University, [2]Centre for Dutch Language and Speech, Belgium, [3]The Eargroup, Belgium

P1-6
Bilingual development in deaf children using cochlear implant
Ritva Takkinen
University of Jyväskylä

WR-G04

P1-7
Language development and gestures in Mexican Spanish speaking children
Rosa Patricia Bárcenas, Donna Jackson-Maldonado
Universidad Autónoma de Querétaro

P1-8
The role of sign language skills in learning to read and write by Deaf bilingual children: Evidence from French Sign Language data
Nathalie Niederberger
Lycée Français La Pérouse

P1-9
Gestural or linguistic pointing? Developmental issues in sign linguistics
Nini Hoiting
Royal Effatha Guyot Group (KEGG, The Netherlands

P1-10
Two sources for ASL-English mixing by young bimodal bilinguals
Deborah Chen Pichler, Lesley Quinn
Gallaudet University

P1-11
Error patterns in vocabulary choices in deaf students: A response analysis of synonyms and antonyms in American Sign Language
Rebecca McVey, Robert Hoffmeister, Catherine Caldwell-Harris
Boston University

P1-12
Comparing bimodal and monomodal ASL phonological development: The development of hand configuration and location in early signs of a hearing coda child
Julie Hochgesang
Gallaudet University

P1-13
Circular motion gestures can help young children learn part names of objects
Harumi Kobayashi, Tetsuya Yasuda
Tokyo Denki University

P1-14
Children's use of gesture to resolve lexical ambiguity
Judith Holler, Evan Kidd
University of Manchester

P1-15
Iconic gesture cues facilitate lexical-semantic learning for naming and extension of object labels
Nina Capone
Seton Hall University

WR-S9

P1-16
The notions of L2 learners of Catalan on the links between speech and writing
Liliana Tolchinsky, Naymé Salas, Joan Perera
University of Barcelona

P1-17
Discrete naming speed, serial naming speed and literacy in children with word finding difficulties
David Messer[1], Julie Dockrell[2], Nicola Murphy[3]
[1]Open University, [2]Institute of Education, [3]University of Hertfordshire

P1-18
Deviant over regularization patterns in verbal morphology in Dutch children at risk for dyslexia
Evelien Krikhaar, Charlotte Koster, Pieter Been
University of Groningen

P1-19
Atypical lateralization in auditory regions of dyslexic children: Is there a reduced right hemispheric contribution to temporal integration and segmentation?
Wessam Mohamed, Isabella Paul, Christian Wienbruch, Thomas Elbert
University of Konstanz

P1-20
Phonological skills are clinically stable markers for dyslexia
German Brandstoetter, Daniel Holzinger
Hospital Barmherzige Brueder, Austria

P1-21
Dyslexia – An audiovisual speech processing deficit? Evidence from three eye tracking studies
Thomas Kaltenbacher, Peter Hummer, Britta Widerin
University of Salzburg

P1-22
Written word form learning: Orthographic fast mapping abilities of at risk children
Kenn Apel, Shannon Hall-Mills, Catherine Conlin, Shurita Thomas-Tate
Florida State University

P1-23
Relationship between early speech delay and subsequent reading abilities in Spanish: An analysis from evolutive causal models
María Fernanda Lara-Díaz[1], Eva María Aguilar-Mediavilla[2], Miquel Serra[3]
[1]Universidad Nacional de Colombia, [2]Universitat de les Illes Balears, [3]Universitat de Barcelona

P1-24
Phonemic awareness and segmental properties – The influence of oral and reading/writing skills
Dina Alves, Maria João Freitas, Isabel Hub Faria
University of Lisbon/Onset-CEL

P1-25
Dyslexia with or without Specific Language Impairment: Differences in phonology and in auditory processing
Arik Levy, Pascal Zesiger
University of Geneva

P1-26
Metalinguistic awareness of graphotactics in Portuguese/German bilingual children: A pseudo-word writing task
Martin Lauterbach[1], Beatriz Dias[1], Clara Loureiro[1], Edith Mencke[1], Joana Lopes[2]
[1]Language Research Laboratory (LEL), [2]High School of Healthsciences (ESSA)

P1-27
The spelling sensitivity score: A measure of children's developing linguistic knowledge
Julie Masterson[1], Su Jin Lee[1], Kenn Apel[2]
[1]Missouri State University, [2]Florida State University

WR-S10

P1-28
Cognitive, speech and language profile in pre-school and school children with Bardet-Biedl syndrome
Marie- Thérèse Le Normand[1], Scania De Schonen[2], K Hernandez[3], Alain Verloes[3]
[1]Institut national de la santé et de la recherché médicale (INSERM) France, [2]CNRS, Paris [3]Hôpital Robert Debré, France

P1-29
The interplay of language structure, motor programming and executive functions in speech planning: A comparison of Specific Language Impairment, Williams syndrome and high functioning autism
Alessandro Tavano
Scientific Institute E. Medea, Italy

P1-30
Grammatical constructions in Cri du chat syndrome – findings from a case study
Kristian Kristoffersen
University of Oslo

P1-31
Communicative gestures and lexical development in children with Down syndrome
Laura Zampini, Laura D'Odorico
University of Milano-Bicocca

P1-32
Understanding of speaker certainty by children with autism: Based on prosodic and lexical cues
Yui Miura[1], Tomoko Matsui[1], Yoshikuni Tojo[2], Hiroo Osanai[3]
[1]Kyoto University, [2]Ibaraki University, [3]Musashino Higashi Gakuen

P1-33
Grammatical strengths and difficulties in the language comprehension of young children with autism
Gul Jaffery, Christie Roche, Saime Tek, Deborah Fein, Letitia Naigles
University of Connecticut

P1-34
Language development of autistic children in Chinese mother-child communication: A language profile different from western ones
Jing Zhou, Xiaoyan Li, Ying Xia
East China Normal University

P1-35
Assessing language growth and delay between ages 5 and 7
Katherine Magaziner[1], Kelsey Sunderland[1], Peter de Villiers[1], Barbara Zurer Pearson[2]
[1]Smith College, [2]University of Massachusetts

P1-36
The early lexical development and its predictive value to language skills at two in prematurely born very low birth weight children
Suvi Stolt[1,2,3], Anu Klippi[1], Kaisa Launonen[1], Leena Haataja[2], Helena Lapinleimu[2], Liisa Lehtonen[2]
[1]University of Helsinki, [2]Turku University Central Hospital, [3]University of Turku

P1-37
Assessing developmental changes in spelling in at risk kindergarten and first grade children
Kenn Apel[1], Elizabeth Wilson-Fowler[1], Catherine Conlin[1], Julie Masterson[2], Howard Goldstein[1]
[1]Florida State University, [2]Missouri State University

P1-38
Evaluating inter-rater reliability and clinical applicability of the constraint-based nonlinear phonological assessment tool NILPOD
Angela Ullrich[1], B. May Bernhardt[2], Roswitha Romonath[1]
[1]University of Cologne, [2]University of British Columbia

P1-39
Prosodic abilities in Spanish adolescents with Williams syndrome
Pastora Martinez-Castilla, Maria Sotillo
Universidad Autónoma de Madrid

WR-S11

P1-40
Frequent frames and noun categorization in Spanish child-directed speech
Sara Feijóo[1], Elisabet Serrat[2], Carme Muñoz[1], Jessica Serrano[2]
[1]Universitat de Barcelona, [2]Universitat de Girona

P1-41
Fast mapping between grammatical constructions and meaning: An experiment in French children aged 3 to 4
Françoise Bourdoux[1], Christelle Maillart[1], Christophe Parisse[2], Fanny Dupont[1], Sophie - Bérengère Ribot[1]
[1]University of Liège, [2] CNRS-Paris-X University

P1-42
Skewed distributions in the input and formulaic matrix clauses in early complement clause constructions: A case study in German
Silke Brandt, Elena Lieven, Michael Tomasello
Max Planck-Institute for Evolutionary Anthropology

P1-43
Pragmatic semantic factors and input play a role in Danish children's development of passive constructions
Lone Sundahl, Kristine Jensen de López
University of Aalborg

P1-44
Using syntactic priming to investigate semantic and lexical factors in English speaking children's early passives
Katherine Messenger, Holly Branigan, Janet McLean, Antonella Sorace
University of Edinburgh

P1-45
Lexical and abstract components of noun phrase structure in young children: Evidence from syntactic priming
Holly Branigan, Janet McLean, Kate Messenger, Manon Jones
University of Edinburgh

P1-46
Age of acquisition effects in ergativity: Evidence from high-proficient native and non-native speakers
Adam Zawiszewski[1], Beatriz Fernández[2], Itziar Laka[2]
[1]Max Planck Institute for Human Cognitive and Brain Sciences, [2]University of the Basque Country

P1-47
Social knowledge contextualizes the initial learning of a new word order
Franklin Chang, Tessei Kobayashi, Shigeaki Amano
NTT Communication Sciences Laboratories, Japan

P1-48
Children's comprehension of passives in Mandarin Chinese
Ting Xu, Xiaolu Yang
Tsinghua University

P1-49
Cantonese children's processing of relative clauses: Cross-linguistic comparisons with English and German children
Angel Chan[1], Elaine Lau[2], Elena Lieven[3], Michael Tomasello[3]
[1]Chinese University of Hong Kong, [2]University of Hawaii, [3]Max Planck Institute for Evolutionary Anthropology

P1-50
Structural biases in acquisition: Evidence from miniature language learning
[1]Elizabeth Wonnacott, [2]Elissa Newport
[1]The University of Oxford, [2]The University of Rochester

P1-51
When do familiar verbs make a sentence harder to understand?
Kirsten Abbot-Smith[1], Miriam Dittmar[2], Michael Tomasello[3]
[1]University of Plymouth, [2]University of Zurich, [3]Max Planck Institute for Evolutionary Anthropology

P1-52
Animacy in early transitives: A study of spontaneous child productions
Nola Stephens
Stanford University

P1-53
The functional basis of children's early multiword constructions: Evidence from Irish and English child directed speech
Thea Cameron, Tina Hickey
[1]University of Manchester, [2]University College Dublin

P1-54
Comprehension of argument structure: Evidence from infants and the preferential looking paradigm
Claire Noble, Caroline Rowland, Julian Pine
University of Liverpool

P1-55
Specificity vs. generality in the verb lexicon of Hebrew speaking children
Sigal Uziel-Karl
Haifa University

Poster Session 2 – Tuesday 29 July 14.30 - 16.00 [Abstracts: pp. 181-201]

WR-G03

P2-1
Code-switching in narrative story-completion tasks in Mexican-heritage preschoolers
Jennifer Vu, Alison Bailey
University of California, Los Angeles

P2-2
A comparison of the verbal justifications in the conversations of middle-school children with their parents and with their peers
Peggy Goetz
Calvin College

P2-3
"*He was angry and I don't know why.*" Children's early understanding of complex emotion and its manifestation within storybook narration
Naomi J. Aldrich[1], Harriet R. Tenenbaum[2], Patricia J. Brooks[1,3], Karine Harrison[2], Jennie E. Sines[2]
[1]Graduated Center City University of New York, [2]Kingston University, [3]College of Staten Island

P2-4
Narrative components and cohesive devices in fantasy narratives, personal narratives, and scripts: A developmental study of Mandarin-speaking children in Taiwan
Chien-ju Chang
National Taiwan Normal University

P2-5
Conversation as a way to improve 5 to 10-year old children's stories
Edy Veneziano[1], Christian Hudelot[2], Laetitia Albert[2]
[1]CNRS-Université Paris X, [2]Université Paris Descartes-CNRS

P2-6
Narrative structures in L1 and L2: What's the difference?
Christine Möller
Keil University

WR-G04

P2-7
Pragmatic and contextual differences in French and Turkish caregivers' input
Feyza Turkay[1], Sophie Kern[1], Caroline Rossi[2]
[1]L'Universite de Lyon, [2]CNR, Lyon

P2-8
References to internal states in Polish and American mother-child narratives
Andrea Zevenbergen[1], Ewa Haman[2], Aleksandra Olszanska[2], Shelly Thielges[1]
[1]SUNY Fredonia, [2]Warsaw University

P2-9
The effect of adult's scaffolding on the narrative skills of children
Olga Soler-Vilageliu, Maria Rosa Solé-Planas
Universitat Autonoma de Barcelona

P2-10
Language use during bilingual parent-child conversations
Medha Tare, Susan Gelman
University of Michigan

P2-11
Japanese fathers' speech to sibling pairs: Young children's social skills challenged
Hiroko Kasuya, Kayoko Uemura
Bunkyo Gakuin University

P2-12
Cultural and linguistic variations in internal state language
Adina Schick[1], Anat Stavans[2,3], Gigliana Melzi[1]
[1]New York University, [2]Hebrew University, [3]Beit Berl College

P2-13
Linguistic and cultural differences in mother-child narratives
Ana Maria Stahl Zilles[1], Gigliana Melzi[2], Fernanda Knecht[1], Gleides Lopes[2]
[1]Universidade Vale Do Rio Dos Sinos (Unisinos), [2]New York University

P2-14
Exploring changes in dyadic contributions to children's early narrative development
Kimberly Reynolds Kelly, Alison L. Bailey
University of California

P2-15
Vocal-speech imitation developmental changes in Russian mother-child dyads and orphans
Olga Frolova, Elena Lyakso
Saint Petersburg State University

P2-16
An intensity-specific dyadic approach to analyzing affect attunement during early mother-infant interaction: A methodological comparison to traditional methods
Pamela Rollins, Lisa Greenwald
University of Texas

WR-S9

P2-17
English/Spanish child bilingual transfer: The case of NN compounds
Raquel Fernández Fuertes[1], Juana M. Liceras[2], Esther Álvarez de la Fuente[1], Susana Muñiz Fernández[1], Isabel Parrado Román[1], Anahí Alba de la Fuente[2]
[1]University of Valladolid, [2]University of Ottawa

P2-18
Rules versus analogies for the English past tense: Does similarity to stored regulars influence regular inflection in a "wug-test"?
Victoria Byrne, Ben Ambridge
University of Liverpool

P2-19
Verb morphology in Catalan speaking children. From 2 years to 3 years, from no productivity to little productivity
Jèssica Serrano[1], Elisabet Serrat[1], Sara Feijoo[2]
[1]University of Girona, [2]Univeristy of Barcelona

P2-20
Modelling the development of the German participle in a constructivist neural network
Nicolas Ruh, Gert Westermann
Oxford Brookes University

P2-21
Learning irregular plurals – why irregulars are like regulars
Inbal Arnon, Eve Clark
Stanford University

P2-22
Representation of changes in nominal morphology by learners of Catalan as an L2
Naymé Salas, Liliana Tolchinsky, Mila Albert
University of Barcelona

P2-23
ERP components following morpho-syntactic errors in typically developing children
Stacy Betz
University of Washington

P2-25
Italian for beginners: An ERP study on language learning in 6 month old children
Regine Oberecker[1,2], Jutta Müller[2], Angela D. Friederici[2]
[1]Charité University Medicine, [2]Max-Planck-Institute of Human Cognitive and Brain Sciences

P2-26
Simpler is not always easier: L1 acquisition of determiner phrase by a simultaneous Mandarin-English bilingual
Meiyun Chang-Smith
Australian National University

WR-S10

P2-28
Validity of parent report measures of vocabulary and grammar for 2 year old Irish speaking children
Ciara O'Toole, Paul Fletcher
University College Cork

P2-29
Vocabulary assessment in toddlers: A comparison between 2 versions of the French adaptation of the computerized comprehension test
[1]Pascal Zesiger, [1]Lucie Schoenhals, [1]Arik Levy, [1]Daniela Gabriel Mounir, [2]Margaret Friend
[1]University of Geneva, [2]San Diego State University

P2-30
The relation between question asking and expressive vocabulary in low and middle income families
Marnie Arkenberg[1], Brian MacWhinney[2], Rachel Bryner[2], Caroline Ydstie[3]
[1]Peace College, [2]Carnegie Mellon University, [3]University of Pittsburgh

P2-31
A normative study of the development of vocabulary and grammar in young German-speaking children assessed with a German language development inventory
Satyam Schramm, Barbara Stumper, Gisela Szagun
Carl von Ossietzky University

P2-32
Serial order short term memory predicts later vocabulary development: Evidence from a longitudinal study design
Anne-Lise Leclercq[1], Martine Poncelet[1], Martial Van der Linden[2,1], Steve Majerus[1]
[1]University of Liège, [2]University of Geneva

P2-33
Does expressive vocabulary size at 24 months predict later language and literacy skills?
Joanne Lee
Wilfrid Laurier University

P2-34
The development of grammatical skills in Swedish children with language impairment: The relationship between phonological and lexical skills at 5 and grammatical skills at 10
Christina Reuterskiold[1], Kristina Hansson[2], Birgitta Sahlén[2]
[1]New York University, [2]Lund University

P2-35
A cross linguistic comparison of the relationship between the home literacy environment and early receptive vocabulary
Adrianne Simpson[1], Lucie Schoenhals[2], Ana Duenas[1], Pascal Zesiger[2], Margaret Friend[1]
[1]San Diego State University, [2]University of Geneva

P2-36
Early development of lexical comprehension and production in an Italian sample: A longitudinal study
Alessandra Sansavini[1], Annalisa Guarini[1], Silvia Savini[1], Arianna Bello[2], Silvia Stefanini[2], Cristina Caselli[3]
[1]University of Bologna, [2]University of Parma, [3]Institute of Science, Technology and Cognition, CNR

WR-S11

P2-37
Mapping and extending novel verb labels by Japanese 18-month-old children
Tessei Kobayashi, Ryoko Mugitani
NTT Communication Science Laboratories, Japan

P2-38
Lexical development in Cantonese-English bilingual children
Virginia Yip[1], Stephen Matthews[2]
[1]Chinese University of Hong Kong, [2]University of Hong Kong

P2-39
Word learning in monolingual and bilingual 17-month-olds acquiring English and French
Madelaine Krehm[1], Karen Mattock[2], Linda Polka[1], Susan Rvachew[1]
[1]McGill University, [2]Lancaster University

P2-40
A cross linguistic analysis of children's first prepositions
Caroline Rossi[1], Martine Sekali[2], Angelika Kochan[3], Aliyah Morgenstern[3], Stephanie Caet[4]
[1]DDL, [2]Université Paris 10, [3]Ecole Normale Supérieure Lettres et Sciences Humaines, [4]University of Lyon 2

P2-41
Word learning and executive functioning in young monolingual and bilingual children
Raluca Barac[1], Ellen Bialystok[1], Agnes Blaye[2], Diane Poulin-Dubois[3]
[1]York University, [2]Universite de Provence, [3]Concordia University

P2-42
Names that are not words: Older infants still associate non-linguistic sounds with pictures
Katie Alcock, Kirsty Krawczyk
Lancaster University

P2-43
Acquisition of universal and language-specific sound symbolism
Katerina Kantartzis[1], Sotaro Kita[1], Mutsumi Imai[2]
[1]University of Birmingham, [2]Keio University

P2-44
Word recognition and lexical development in preterm children: A longitudinal study
Marta Ramon-Casas, Laura Bosch
Universitat de Barcelona

P2-45
Children's word learning from storybooks and definitions across variable contexts, age groups & abilities
Kathryn Wilkinson, Carmel Houston-Price
University of Reading

P2-46
Conceptual attributes of heard words modulate toddlers' attention to the visual scene
Elizabeth Johnson[1], Falk Huetig[2], James McQueen[2]
[1]University of Toronto, [2]Max Planck Institute for Psycholinguistics

P2-47
Learning names and generalizing nouns: Insights from a dynamic systems model of word learning
John Spencer[1,2], Larissa Samuelson[1,2]
[1]University of Iowa, [2]Iowa Center for Developmental and Learning Sciences

P2-48
Word learning context influences toddler fast mapping and word retention
Jessica Horst
University of Sussex

P2-49
From word-object association to fast mapping: A longitudinal study
Diane Poulin-Dubois, Marina Katerelos
Concordia University

P2-50
Examining the impact of early bilingual exposure on the event-related potentials of children and adults in a word-learning task
Jeannine G. Fillmore[1], Elizabeth Kay-Raining Bird[1], John F. Connolly[2], Aaron J. Newman[1]
[1]Dalhousie University ,[2]Université de Montréal

P2-51
Dutch-learners' acquisition of nonadjacent dependencies: Diminutive versus plural agreement
Marieke Van Heugten, Elizabeth Johnson
University of Toronto

Poster Session 3 – Thursday 31 July 14.30 - 16.00 [Abstracts: pp. 202-222]

WR-G03

P3-1
Non-visual joint attention and early language acquisition
Joan Test
Missouri State University

P3-2
Affect attunement during early mother-infant interaction: How specific intensities predict the stability of infants' coordinated joint attention skills
Lisa Greenwald, Pamela Rollins
University of Texas

P3-3
The acquisition of internal state words in early mother-child interaction in German
Gisela Klann-Delius, Christina Kauschke
Freie Universität Berlin

P3-4
Mother and child conversations on agent and action information during joint picture-book reading
Toshiki Murase
Shimane University

P3-5
Look at that nice dog! Parents' use of language to direct children's attention to the world
Brenda Phillips, Richard Ely, Jean Berko Gleason
Boston University

WR-G04

P3-6
Do types of givenness influence children's word order?
Christine Dimroth, Bhuvana Narasimhan
Max Planck Institute for Psycholinguistics

P3-7
A developmental study of subject omission in child English
Mary Hughes, Shanley Allen
Boston University

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[1]Universidade de Sao Paulo, [2]Radboud Universiteit

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[1]*Université Pierre Mendes,* [2]*Université de Genève*

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[1]*Tokyo University of Agriculture and Technology,* [2]*Sophia University*

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[1]La Trobe University, [2]Centre for Community Child Health, Royal Children's Hospital, [3]University of Melbourne, [4]Murdoch Children's Research Institute

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[1]University of Reading, [2]University of the Aegean

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[1]*The City University of New York, Bronx, United States*

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[1]*Budapest University of Technology,* [2]*Eötvös Loránd University of Sciences,* [3]*Hungarian Academy of Sciences*

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[1]*University of Bristol,* [2]*University of Maryland*

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[1]Université Paris 8, [2]CNRS, [3]Ludwig-Maximilians-Universität

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[1]CNRS Paris, [2]Paris 8, [3]University of Cambridge

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Jagellonian University

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[1]University of Milano-Bicocca, [2]University of Bari

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Matthew Saxton, Julie Dockrell, Eleri Bevan, Jo van Herwegen
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Assimina Ralli[1], Julie Dockrell[2]
[1]Technological Institution of Athens, [2] Institute of Education, University of London

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[1]Redbridge Primary Care Trust, UK, [2]City University

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Ageliki Nicolopoulou[1], Hande Ilgaz[1], Aline Sá[1], Carolyn Brockmeyer[1], Kai Schnabel Cortina[2]
[1]Lehigh University, [2]University of Michigan

Symposium Abstracts

Symposium Session 1 - Monday 28 July 11.00 - 13.00
Symposium Number – S1-1
Chair: Philip Dale, *University of New Mexico*
Discussant: Donna Thal, *San Diego State University*

Screening for language delay in preschool children: Experiences and methodological challenges

Description:
In the past two decades, very substantial advances have been made in the assessment of communicative development in young children. They include preferential looking, touch-screen response modes, evoked potentials and other EEG techniques, and others. Most notable is the development and validation of parent-report measures of development, which in addition to their demonstrated reliability and validity, are uniquely cost-effective. They raise the possibility of large-scale screening for language delay as a part of public health programs for children. Early identification, or even prediction, of language delay is desirable because of the continuing academic and social consequences of communicative difficulty, and because intervention is likely to be more effective, and ultimately less costly, if begun young.

The present symposium brings together researchers and a discussant, representing research in four countries (Denmark, Sweden, UK, and US), who are concerned with the early assessment of communicative development, and its significance for identifying and/or predicting language delay. They will draw on their experience to address some of the very knotty questions that confront any attempt to develop a broad screening program. They include, among others:

1. How early should we assess? Where is the optimal tradeoff between early identification and the high rate of false positives obtained with young children?
2. Whatever the answer to question #1, are there other kinds of information that can be used to reduce the rate of false positives at that age?
3. What role can social, demographic, and/or genetic factors play in prediction?
4. Can we rely entirely on parent report, or does it need to be supplemented with some kind of direct testing?
5. Should we use "unisex" or separate-gender norms for screening measures, given the well-established, but modest, gender differences found in early communicative development?
6. What is the best outcome to be used as the "gold standard" for validating a screening program? A single test, a battery of tests, parental concern, or some combination of these?
7. How are the answers to these questions influenced by the unique features of each language's structure?
8. And similarly, how are the answers to these questions influenced by the unique features of the educational and healthcare systems in each country?

It is hoped that the experience and insight of the symposium presenters will provide an improved foundation for others who undertake screening projects in the future.

National language screening in Denmark: The development and testing of a new parent and day-care administered instrument
Dorthe Bleses, Rune Jørgensen, Kasper Østerholdt Jensen
University of Southern Denmark

Since August 1st 2007 the municipalities in Denmark have been obligated to offer parents of three year old children in Denmark a language screening of their child. The purpose of the national screening is not only to identify children with potential language delay in order to initiate early intervention, but also to provide a tool for planning a more differentiated and stimulating language environment in daycare centres. The Ministry of Family and Consumer Affairs gave the task of developing an instrument for the national screening to the Center for Child Language, University of Southern Denmark, working together with the IT-company Mikro Værkstedet and Centre for Higher Education, Copenhagen.

In contrast to most evaluation instruments (cf. Nelson et al 2006) this new instrument is designed specifically for screening purposes as all parts aim at obtaining scores with skewed distributions allowing a finer distinction among children in the lower tail of the distribution (cf. Vach). The instrument is in part based on empirical evidence of Danish children's language acquisition (cf. Bleses et al 2006; 2007; submitted). The screening instrument includes two different types of assessment: parent report checklists (developed on the basis of large scale Danish CDI-studies) and structured tests administered by the day care staff. The instrument includes various measurements of productive and receptive language skills.

Mikro Værkstedet, in collaboration with the Center for Child Language, has developed a web based management system to assist municipalities in implementing the language screening. All language screenings are stored in a database, which are accessible for research purposes. At the moment one third of the 98 municipalities use the web system encompassing approximately 20.000 children in the first year and several additional municipalities are expected to implement the management system.

We will begin by outlining the general framework of the screening tool and the web based management system. Subsequently we will present some first analyses of outcome of the language screenings of the first cohort of an expected 10.000 three year old children focusing on the following questions. Can we identify different profiles in children identified by the instrument as suffering from a potential delay? To what extent are specific profiles or the delay in general related to social or demographic factors? Is there a relation to other problems like general (cognitive) delay or social problems? Is there a fraction among the children with a delay, for whom a screening at the age of 3 years seems to be too late? Can we identify children who do not need any follow up, that is, reduce the frequency of false positives? The results will be compared to contemporary studies on children with language delay.

The construction and pilot testing of a short CDI-form to be used for screening in Danish children
Werner Vach
University of Southern Denmark

In contemporary Danish society, there is increasing attention to the early language development in children, as this is more and more recognised as an essential key to cognitive development and later success in school. A governmental commission suggested in 2006 a nationwide screening for language delay in children at age 3, however, without any concrete suggestions to realise such a task.

The Center for Child Language at the University of Southern Denmark decided to develop a first concrete proposal for the conduct of a nationwide screening based in part on the use of parental forms, because:

- There exist data from a population based cross sectional study using the Danish adaptation of the MacArthur-Bates CDI covering children up to the age of 36 months which allows to identify suitable items and to compute norms.

- A nationwide screening should be cost effective, as substantial resources will be needed for further evaluation, pedagogical efforts and treatment in the children identified, and use of parental reports allows a nationwide screening at relative low costs.
- Empirical research has shown that parental reports allow a rather reliable and valid assessment of a child's language acquisition status.
- Empirical research has suggested that vocabulary size is among the best predictors for later language development in children between 2 and 4 years of age.

In constructing a short form with 100 items we tried to use as much as possible the evidence we have on early language acquisition in Danish and on parental reports from our cross sectional studies. We tried to avoid items related to sex or social factors or items we know that not all parents are willing to judge. In contrast to many other studies constructing short forms, our ultimate goal was not to obtain a maximal correlation with the overall CDI vocabulary score, but to obtain a skewed distribution of the resulting score supporting an optimal discrimination among children in the lower tail of the distribution. We further tried to identify problematic items by formal checks based on item response models.

The short form was tested in a pilot study in cooperation with all kindergardens in the municipality of Fredericia, including an attempt to determine to what degree one can use the staff of such institutions as substitutes, if the parents had no sufficient knowledge of Danish.

With minor modifications, the short form became later part of the official material for the nationwide screening, which started in September 2007.

In my talk I will describe the process from the first steps of the construction to the final application, focusing on methodological challenges like the decision to use gender-specific norms and on some experiences from the pilot study and the nationwide screening.

Gains and challenges in early screening for language delay: Experiences from screening in Sweden

Mårten Eriksson[1], Monica Westerlund[2]
[1]University of Gävle, [2]Uppsala University Hospital

There are important gains to be achieved in a successful screening for children at risk of language delay. Early identification generally provides better opportunities for successful intervention and it will often qualify the child for dedicated resources. However, early screening is also associated with several obstacles of which some are general and others are related to a particular welfare system.

One general problem concerns the continuous nature of differences in language competence while the screening methodology has been developed for dichotomous events like the presence or absence of a tumour. This makes any cut-off points for language competence arbitrary and results in great variety in different prevalence estimates. Moreover, some of the key measures in screening, such as the positive predictive value (PPV), are prevalence dependent. Hence, it is hard to compare screening studies with different prevalence rates.

Another problem concerns the broad spectrum of language disorders. Some disorders, such as SLI, are specific (at least by definition) while others like pragmatic speech disorder often is accompanied by various neuropsychiatric symptoms. The latter case raises the issue of co-morbidity and the question of what a screen really captures. Moreover, a decision of whether cases with other, more apparent characteristics such as Down syndrome or severe lack of concentration should be included in the screened population would also affect all summary epidemiological measures.

A third general problem, whose solution depends on the availability of particular data, is the question of a gold standard. All screening, including screening for language disorders, leans on the premise that each participants true status of being affected or not, is available. A careful examination by a professional (usually a speech and language pathologist) is often used as a gold standard. However, this solution is hard to maintain in studies including thousands of children. Therefore, often only a subset of the screened population is examined. In such cases it is important to include both screening positives and screening negatives in the examined group. Otherwise only half of the key measures can be computed, making the results incomplete. Alternatives to a professional examination are information from existing records, for example the Child Health Clinics or elementary schools.

Finally, a screening could be either general or selective. The success of a general screening depends to a large extent on its ability to cover the whole target population. Studies have shown that the prevalence among unscreened subjects is considerably higher than among the screened ones. Hence, the possibility to screen the whole target population is essential for a general screening. In contrast, a selective screening is directed to a specific group with many risk factors, such as speech and language problems in the family, low socioeconomic group and parental concern. Yet, high attendance is important in selective screening also, and only the last of the here listed risk factors, parental concern, is likely to result in high attendance. Experiences of general screening for risk of language delay, using an alternative gold standard will be discussed within the Swedish welfare system.

Some useful insights from the Twins Early Development Study (TEDS) for screening projects

Philip Dale
University of New Mexico

The Twins Early Development Study (TEDS) is a very large, population-based study of early development in twins born in 1994-96 in England and Wales. Although it was not designed as a screening study, it has a number of features which make it highly relevant for investigating screening issues: The sample size is large (in excess of 9,000 twin pairs at 7 years); it is population-based, and therefore relatively representative of the (English-speaking) population; assessment begins at 2 years; and a very rich database of information about children and families is available for the participating children. In this presentation, I will draw on longitudinal information from the TEDS dataset to address four questions central to screening:

1. When is the optimal age to screen for early delay? Preliminary analyses utilizing information from the ages of 2, 3, and 4 years to predict language difficulties at 7 years suggest that the prediction is substantially better from age 3 than from age 2, but only modestly better from age 4 than from age 3.

2. What should be the 'gold standard', or criterion measure, for use in evaluating screening measures and procedures? Drawing on the work of a number of colleagues on the TEDS project, I will argue that the use of one or more tests alone is less adequate than focussing on parental concern and professional involvement as well.

3. Should we use 'unisex' or gender-specific norms, given the well-established but modest gender differences in early communicative development? We have examined the two subsets of children for whom this decision makes a difference; (1) boys classified as delayed by unisex norms, but not gender-specific norms; and (2) girls classified as non-delayed by unisex norms, but delayed by gender-specific norms. Outcomes for these groups suggest that gender-specific norms may be more appropriate, even though that is relatively uncommon with most current language measures. In particular, the subset of girls mentioned above were nearly as likely to have continuing problems as girls who were unambiguously delayed early in development.

4. How can other information be utilized to reduce the level of false positives in screening? In TEDS, a modest increase in predictive accuracy could be made by utilizing information on family history of early language and/or reading difficulties. Some very recent molecular genetics research in TEDS has identified a set of DNA markers (SNPs) which also correlate with outcome of children with early delay, though the effect size is very small as yet.

Symposium Session 1 - Monday 28 July 11.00 - 13.00
Symposium Number – S1-2

Chair: Aylin Küntay, *Koç University*
Discussant: Sarah Haywood, *University of Edinburgh*

Referential communication in preschool children: What conditions make them more adept?

Description:
In face-to-face communication, there are multiple ways to refer to an object, including gestural means, pronouns, nouns, or more complex noun phrases such as adjectivals and relative clauses. Effective referential communication requires that speakers choose the appropriate form by taking into account where their addressee's perceptual and attentional perspective is directed towards. There are now several empirical demonstrations (Matthews, Lieven & Tomasello, 2007; Nadig & Sedivy 2004) that young children can succeed in referential communication to an extent that earlier research attributing cognitive egocentrism to preschool children would not have predicted. Yet, researchers agree that competence in referential communication tasks is fragile. This symposium includes three recent studies focusing on the nature of preschool-age children's emergent skills during tasks involving communicative perspective taking.

The first paper presents two studies. In the first study, 4-year-old children are demonstrated to generate interpretations of ambiguous requests by using a speaker's perspective. In the second study, 3- to 4-year-old children are shown to indicate an implicit awareness of the ambiguity of a message in their nonverbal behavior. The results are discussed in the light of the role of developing inhibitory control skills of young children.

The second paper compares the adequacy of referential constructions of 5- and 9-year-old Turkish children, as well as adults, in different contexts. A first study revealed an age-related increase in the listener-sensitivity of referential expressions across the three ages. A second study, with another group of 5-year-olds, demonstrated that prompting for polite, requestive constructions led to less ambiguous referential expressions. However, redundancy also increased in the condition where children produced elaborate request forms with adequate referring expressions.

The third paper addresses the question of how children learn from feedback to adapt referential descriptions to context. They report training studies with 2- and 4-year-olds, where they provided either general clarification requests or specific feedback that included the appropriate referring expression as part of the request. They found that training benefited both age groups more in the specific feedback condition. In addition, although referential forms were elaborately displayed in the specific feedback condition, this did not lead to more redundant language than in the general feedback condition.

The discussion of the symposium will include the importance of prerequisite cognitive skills, pragmatic task demands, the interactional mechanisms of communicative development, and the relation between implicit and explicit awareness. We will put under scrutiny the conditions under which young speaker show referentially adept behavior.

Using perspective to decipher and detect ambiguous messages

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One key aspect of successful referential communication is the ability to identify information that is or is not shared with a conversational partner, such as whether a partner is aware of a particular fact, has experienced a particular event, or whether the partner can see a particular object. The ability to track shared knowledge or "common ground" (Clark, 1992) requires an appreciation of the social and situational context as well as the ability to adopt another person's perspective.

In two studies, we examined different components of preschoolers' ability to track shared knowledge within communications, namely 1) their ability to use a speaker's perspective to guide their interpretations of requests, and 2) their appreciation of message clarity/ambiguity from a third party perspective.

With respect to children's interpretation skills, previous research has demonstrated that although 6 year-old children can use the perspective of a speaker to guide interpretations (Nadig & Sedivy, 2002), children have more difficulty than adults in correcting an egocentric interpretation (Epley et al., 2004). In the first study, 3 to 4-year-old children were asked to retrieve objects from a display case by a speaker. The knowledge state of the speaker was manipulated through the use of sliding doors which obscured her view from particular objects. Findings demonstrated that although young children displayed some egocentric behaviours, they tended to make use of the speaker's perspective, rather than their own perspective, to guide their interpretation of ambiguous statements.

Research on children's ability to judge message quality has demonstrated that children younger than 5 tend to overestimate the quality of a message, particularly when they are aware of the intended message (Sodian, 1988). In the second study, 3 to 4-year-old children were asked to judge the success of a message provided by a puppet to a second experimenter. The knowledge state of the child (i.e., whether he/she was made aware of the intended referent prior to the description) as well as the clarity of the message (i.e., whether the description provided by the puppet is ambiguous or uniquely identifies a referent) was manipulated. Findings showed that children demonstrate an implicit awareness (i.e., eye gaze, response latency) of ambiguity in messages directed towards a listener, even when they have privileged knowledge of the messages meaning. The relation between implicit awareness and explicit indication of message ambiguity will be discussed.

Both studies will present the relationship between children's performance on the communicative tasks and their performance on nonverbal inhibitory control measures. The role of inhibitory control will be discussed with respect to children's ability to suppress their own perspective in order to appreciate the perspective of their conversational partner.

Together, we will present findings of children's emergent skills in communicative perspective taking and will discuss the cognitive skills that contribute to successful performance in communicative contexts.

Learning to adapt referring expressions to context

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Training studies have shown that two-year-olds can learn to succeed in referential communication tasks if given feedback (asked for clarification) about their ambiguous attempts at reference (Matthews, Lieven & Tomasello, 2007). However, it is unclear from prior studies whether the outcome of training consists of a simple strategy to produce the longest utterance possible regardless of an addressee's needs for information (as some findings would suggest e.g. Whitehurst, Sonnenschein, & Ianfolla, 1981) or whether children can learn to produce the necessary information in a given context.

It is also unclear how children learn from feedback in the form of clarification requests. It might be that requests for clarification (e.g. a *general* request like 'Which sheep do you need?") force children to come to terms with the uninformative nature of their original referring expressions (e.g. a request for "The sheep" uttered in the context of viewing two similar sheep). That is, an arduous process of repair might drive learning. On the other hand, learning might be better facilitated by requests for clarification that include a model of an ideal referring expression as part of the question (e.g. a *specific* request like "Do you need the white sheep or the black sheep?"). That

is, children might learn (with relatively little effort) by picking up on the model and using similar forms in the future.

To address the above issues, 84 two- and four-year-olds were tested for their ability to request 36 stickers from arrays that either did or did not contain similar distracters. Children either received *general feedback* or *specific feedback* (as illustrated above). The children's first attempts at requesting stickers and their repairs in response to feedback were coded.

Within a few trials, children in both age groups and training conditions were significantly more likely to describe stickers in detail (on their first attempt) when this was necessary because distracter items were present. Children who received specific feedback produced significantly more informative descriptions overall (in first attempts and repairs) and learnt to do so faster (with fewer turns in repair) than children in the general feedback condition (informative first attempts: significant quadratic trend in the specific condition, significant linear trend in the general condition).

These results demonstrate that children as young as 2 ½ can learn to adapt referring expressions to the number of potential distracters in the communicative context - they are not simply as descriptive as possible at all times. It also appears that providing models (specific feedback) in the right motivational context is more helpful than providing feedback that results in a more arduous process of repair on the part of the child (general feedback). Importantly, while training with specific feedback rapidly enabled children to describe stickers in detail it did not make them more redundant than children in the general feedback condition. We assume that the children in this study learnt to adapt descriptions to context with foundational but limited understanding of their interlocutor and will discuss how early communicative development may be possible given this assumption.

Learning to integrate partner's visual perspective in referential language: Age and pragmatic intent play a role

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[1]*Koç University,* [2]*Queen's University*

Previous research has shown that perceptual or discourse-based availability of referents to listeners affect preschool-age children's use of referential terms (Matthews, Lieven, Theakson, & Tomasello, 2006; Nadig & Sedivy, 2002). Yet, there is substantial evidence that preschoolers perform less appropriately than older participants in referential communication situations. In this paper, we report on two studies which examine the degree to which native speakers of Turkish, at ages 5, 9, as well as adults, take into account their communicative partner's visual perspective in producing referring expressions.

Participants were instructed to ask for a particular object from an array for a confederate as part of an art-craft activity in three conditions: (1) *common ground condition*, where two similar objects of different sizes were visible both to the participants and their partner (i.e., an adult confederate); (2) *privileged ground condition*, where only one of two similar objects was visible to the partner but both were available to the participant; and (3) *baseline condition*, where there were no competing objects visible to the participant and the partner.

Study 1 included 15 preschoolers (mean age= 5;6), 15 primary school children (mean age = 9;5) and 15 college-age adults. We found a difference across age groups in whether a discriminating size adjective (e.g., *küçük uhu* 'small glue') was used to uniquely specify the target object. We also found a increase across age in the types of constructions employed to ask for the object: preschool-age children using disambiguating adjectives in the common ground condition tended to employ full requestive language involving a verbal form and/or accusative casemarking on the referential noun (e.g., *büyük makas-ı al-ır-mı-sın*, big scissors-ACC take-AOR-YN-2SG, 'will you take the big scissors?') in contrast to those who were using labeling constructions (e.g., *büyük makas* 'big scissors'). In addition, the use of such complex requestive language increased across age groups.

In aiming to increase the likelihood of requestive communicative intent over the instructions in Study 1, we amended our instructions in Study 2, where we tested a new group of 15 preschoolers (mean age = 5;3). We emphasized in the instructions that the participants should ask for objects "nicely and politely" from the confederate. The percentage of full requestive constructions was significantly higher for the group who were prompted for polite requestive language in all conditions. Further, the rate of discriminating adjective production was larger in the group prompted for polite linguistic forms in comparison to the group without such prompting in the common ground condition. However, the percentage of redundant adjective use in the privileged condition increased as well.

Requestive speech may lead to referential clarity, and sometimes redundancy, because making requests calls for specifying enough information to enable partners to determine what action is desired (Ervin-Tripp, Guo, & Lambert, 1990). The perceived requirements of a communicative task are crucial in determining the types of constructions used, which, in turn, affect the form of referring terms.

Symposium Session 1 - Monday 28 July 11.00 - 13.00
Symposium Number – S1-3

Chair: Tilbe Goksun, *Temple University*, Shannon Pruden, *University of Chicago*
Discussant: Letitia Naigles, *University of Connecticut*

Foundations for processing events and learning relational terms

Description:
Verbs are the architectural centerpieces of sentences. To learn these and other relational terms (e.g., run, walk, in, on) infants must first perceive and conceptualize actions in events, abstract the foundational components in these events (e.g., path-manner, containment-support, source-goal, and figure-ground) and assemble those semantic primitives in ways that represent the relational terms in their native language. Building from Talmy's (1985) seminal work in semantics, research is just beginning to explore how infant event perception links to the literature in language development. The papers in the symposium examine 3 questions: 1) What language-relevant event components do infants abstract from events?, 2) What are the developmental trajectories of these event components, and 3) How does contact with the native language change the initial representation of these constructs (i.e., path-manner, goal-source)?

The first paper "Finding the path: Infants notice path not distance in dynamic displays" examines infant discrimination of paths (over and under). Results suggest that with practice, 10-12-month-olds process relational changes not absolute distance changes. Though there are wide individual differences, infants fail to discriminate within category distance changes (e.g., an object +2 above a ball vs. +6 above a ball) but discriminate that same distance when the object moves across category boundaries (+2 over vs. +2 under the ball).

The second paper, "Figure and ground: Conceptual primitives for processing events" expands the literature by including the semantic primitives of figure and ground. These components are keys to Talmy's semantic system and event processing and languages encode them differently with respect to the verb system. Results suggest that 10-12-month-old English-reared infants notice changes in figures but not grounds (e.g., woman vs. man crossing the road) and that 13-15-month-olds recognize grounds. Interestingly, they process ground information narrowly, in ways more consistent with some languages over others.

The third paper "Spatial semantics and cognition: containment, support and tight-fit categories" presents evidence that language-specific semantic categories of containment and support influence nonlinguistic spatial categorization in English- and Korean-reared

infants. Results indicate that 11-month-old Korean infants attend to tight-fit support relations (encoded in Korean) as a single category, whereas English-learning infants at the same age do not.

The last paper "How young children prioritize directed motion event components," asks how children with language experience imitate components of directed motion events (source, goal, manner, and path). Results show that 35-month-olds have no preference in imitating path and goal, whereas 40-month-olds preferred to imitate the path component of an event. Even when a source component was added to the event, children still show preference to path imitation.

This is among the first symposia to link event perception and early language development by demonstrating not only how infants attend to foundational aspects of events, but also how native languages influence attention to particular event components across development. Our discussant focuses on how these event components (path-manner, figure-ground, containment-support, source-goal) constitute foundations for both abstraction of events and learning relational terms. Additionally, implications of these findings for later language development will be discussed.

Finding the path: Infants notice path not distance in dynamic displays

Sarah Roseberry[1], Kathy Hirsh-Pasek[1], Roberta Golinkoff[2], Shannon Pruden[3]
[1]Temple University, [2]University of Delaware, [3]University of Chicago

Verb learning requires attention to semantic and conceptual primitives in events (e.g., *path* and *manner*) as well as the ability to map words onto those conceptual foundations. Recent research shows that infants as young as 6 months are sensitive to static relational categories like *between* (Quinn, et al., 2003), *support/containment* (Casasola & Cohen, 2002), and *tight-fit/loose-fit* (Hespos & Spelke, 2004), and studies examining dynamic events find that 7- to 9-month-olds can discriminate between a variety of *paths* and *manners* of motion (Pulverman & Golinkoff, 2003). While impressive, these abilities fall short of the conceptual categorization required for word learning. Children need to form categories that allow for variability in physical properties but that nonetheless preserve the relational component labeled by the verb. The current study pits relational against physical cues to ask three questions: First, are infants more likely to notice within-category distance changes or across-category distance changes? Second, do infants better discriminate categories and distances given prior experience with test stimuli? Third, do individual differences in infant performance at exposure one predict discrimination at exposure two?

Infants were tested at 7- to 9-months (N=28) and recalled for a second exposure two months later, at 10- to 12-months (N=6). A control group was tested at 10- to 12-months-old only (N=7). Infants were habituated to the movement of a starfish, Starry, at a constant distance OVER a ball in the center of the screen (+2 inches). Two test trials showed a uniform distance change in opposing directions (+/-4 inches). In one test trial, infants saw Starry move along a path above the original position (+6 inches over the ball). Importantly, the original relation between Starry and the ground object (OVER) was preserved in this test trial (Distance Change). In the second test trial, the starfish traveled a path below than the original position. Here, the resulting path was UNDER the ball (-2 inches), showing Starry in a new position relative to the ball (Relational Change). Thus, although the absolute distance change remained the same in both cases (+/-4 inches), only one distance change placed Starry in a different relational category.

Younger infants (7-9 months) were unable to discriminate either the Distance Change or the Relational Change during their first viewing, but preliminary results indicate that 5 of 6 infants successfully discriminated the Relational Change approximately two months later, $p<.05$, but remained unable to discriminate the Distance Change. Additionally, infants' initial performance on the Relational Change predicted follow-up performance on the Relational Change, $p< .05$. Control participants aged 10- to 12-months-olds were unable to discriminate either the Distance or the Relational Change.

These results support the hypothesis that infants are able to discriminate relational changes earlier than distance changes and indicate that experience helps infants discriminate relational changes. Specifically, individual differences in performance during first exposure predict discrimination two months later.

Figure and ground: Conceptual primitives for processing events

Tilbe Goksun[1], Kathy Hirsh-Pasek[1], Roberta Golinkoff[2]
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How do young children perceive and conceptualize events that are relevant to language? Although some research has addressed whether infants notice changes in paths, manners, and goals (e.g., Lakusta & Landau, 2006; Pruden et al., 2006), no research has asked whether infants discriminate between two fundamental components of dynamic events: Figures and grounds. In the sentence, "John ran around the track," John is the figure (or moving entity) and the track is the ground (the stationary setting) against which the action takes place (Talmy, 2000). Although in English most verbs do not encode ground, some languages (e.g., Japanese) incorporate ground into the verb meaning. For example, "crossing a railroad track" (barrier between the starting and the goal points) is codified differently than "crossing a grass area" (with no barrier). Children must distinguish between grounds and figures in dynamic events to learn any language.

Using televised displays of *different people* traversing *various grounds* (e.g., railroad track, road) we asked 1) whether English-reared infants discriminate figures and grounds in nonlinguistic dynamic events; and 2) whether grounds from different categories (as codified by Japanese) are treated differently even for children learning English.

Study 1 examined infants' discrimination of *figures*. Using the Preferential Looking Paradigm without language, English-reared 7-9- and 10-12-month-olds were familiarized with a scene in which one figure (e.g., a woman) traversed across a ground (e.g., a railroad track). At test, the old event was paired with a new event that changed only the figure (e.g., *man* crossing railroad). The dependent variable was looking time at the new versus the old events. Results showed that only the older age group discriminated between figures ($M= 63\%$, $p< .05$).

Study 2 examined infants' discrimination of *grounds*. Using the same paradigm, English-reared 7- 9- and 10-12-month-olds were familiarized with the same scene as above (e.g., a woman traversing a railroad track). At test, however, infants saw the same old event paired with a new event that changed only the ground (e.g., woman crossing a *road*). The comparison of the grounds was also manipulated according to the Japanese distinctions (e.g., *within category* "road vs. railroad" and *between category* "railroad vs. grass"). Neither age group displayed a preference for the novel ground. Additional data from 13- to 15-month-olds indicated a preference for the novel ground ($M= 62\%$, $p< .05$). Further analyses demonstrated that this age group discriminated grounds from different categories (e.g., railroad vs. grass) significantly better ($M = 64\%$, $p< .05$) than grounds from same category (e.g., railroad vs. road).

These results suggest that infants can discriminate between figures (10-12 months) in an event before they can discriminate between grounds (13-15 months). Although infants discriminate between static individuals much earlier, they make the same discriminations in dynamic events later. Grounds are not discriminated until 13-15 months, as infants' attention is presumably focused on the figure prior to that time. Additionally, English-reared infants make categorical distinctions in the discrimination of grounds that is parallel to the distinctions made in Japanese. Implications for event processing and language learning are discussed.

Spatial semantics and cognition: Containment, support and tight-fit categories

Soonja Choi
San Diego State University

Languages differ significantly in the way they categorize spatial relations. For example, English makes a distinction between *containment* (e.g. putting an apple IN a bowl) and *support* (e.g. putting a cup ON a table), whereas Korean makes a distinction between *loose fit* and *tight fit* regardless of containment and support. In Korean, the verb *KKITA* 'tight fit or interlock' is used for both a tight-fit containment relation such as 'putting a book tightly in its cover' as well as various types of tight-fit support relation such as 'putting a Lego piece tightly onto another' (tight attachment) or 'putting a ring tightly on a cone-shaped pole' (tight encirclement).

Recent research on infant cognition (e.g., McDonough et al. 2003) has examined the containment relation, and has shown that preverbal infants (9-, 11- & 14-month-olds) are able to distinguish between tight and loose containment regardless of their language environments. These studies have suggested that infants can initially attend to a large set of spatial features and that they pick out and form the semantically relevant ones as they acquire their language. Furthermore, in a recent study Choi (2006) found that acquisition of spatial terms, in turn, influences nonlinguistic spatial categorization: as English learners use the relevant spatial term (*in*) and increase their vocabulary level (at around 26 months) their sensitivity to the tight- vs. loose-fit containment decreases.

But is the developmental pattern the same for the categories of support (corresponding to English *ON*) and of tight-fit (corresponding to Korean *kkita*)? The support relation is interesting in that, while English expresses all types of support (encirclement, attachment, covering, loose support) with a single particle *on*, many languages make finer distinctions among different types of 'support' and package them differently (Levinson 2003). For the tight-fit category (a category that includes both tight-fit containment and tight-fit support), Korean children need to ignore the containment—support distinction (that many languages make).

The present study explores when and whether language-specific semantic categories of support and tight-fit influences nonlinguistic spatial categorization. For the support category, data from habituation studies suggest that 9-month-old infants nonlinguistically discriminate different types of support (attachment, encirclement, covering, loose support), thus, initially making a finer distinction than a language (e.g., English) may require. However, a comparison (using the preferential-looking paradigm) between infants in English environments and those in Korean environments reveals that 11-month-old Korean infants show a heightened sensitivity for the tight-fit support relation as a single category, whereas English-learning infants do not, suggesting that language may influence the categorization of tight-support relations from as early as 11 months. For the tight-fit category, however, it is at around 18 months that Korean children show sensitivity to form tight-fit as a single category.

The present data support the previous finding that infants can make fine distinctions with regard to spatial relations, and that language interacts with and influences nonlinguistic categorization of spatial relations. However, the precise nature of the interaction and the timing of interaction may vary depending on the spatial category.

How young children prioritize directed motion event components

Anna Yocom, Maia Greene-Havas, Laura Wagner
Ohio State University

Directed Motion (DM) events have multiple components, including a Source, a motion Manner, a motion Path, and a Goal. They are a critical organizing force in language (Talmy, 1985) and important in cognition more generally. Previous work (Carpenter et al., 2005) showed that 12 and 18-month-olds preferentially imitated the Goal of a DM event, but others have found infants to be more flexible (Wagner, 2006).

These studies looked at children's ability to imitate DM events in a forced-choice task to determine the extent of their flexibility and identify potential preferences among the DM components. A new paradigm was used: the Imitation Choice method. In this task, an experimenter modeled a DM event on a board containing a ramp with a goal object at both the top and bottom (e.g. sliding up the ramp to the orange bowl; hopping down the ramp to the red platform). The child's board had the objects in the opposite configuration with respect to the ramp, so both of the modeled Path and Goal components could not accurately be imitated in a natural motion event. Thus, the child had to choose between matching the model's Goal or the model's Path. Children's choices reflect how they prioritize these components in their representations.

The dependent measure in all three studies was which modeled components the child chose to imitate. Coders were blind to the model, and imitations were coded for presence and substance of the enacted event components. In Experiment 1 ($N = 35$, $\mu = 35$ months), the model contained Path (up or down), Manner (hopping or sliding), and Goal (red or orange) components. Results found that younger children had no preference between Path and Goal, matching the model's components approximately equally often. Older children (40-month-olds), however, significantly preferred to match the Path component ($t(11) = 3.3$, $p < .01$). Experiment 2 ($N = 24$, $\mu = 37$ months) asked if children's Path preference stemmed simply from Path being enacted first. An additional, prior component was added: Source. Preliminary results suggest that Source information is reliably omitted (as predicted by Lakusta & Landau, 2005), and again, older children continue to show a preference for Path imitation. Experiment 3 ($N = 24$, $\mu = 37$ months) asked whether a linguistic description can shift children's preferences. The model contained the same Path, Manner, and Goal components as used in Experiment 1. In addition, one of the components was labeled ("I want to go up the slide" or "I want to go to the red bowl"). Preliminary results suggest that labeling one of the event components does make children more likely to imitate it, but the effects of labeling are rather small.

Children's prioritization of DM components depends on several factors, including a desire to maximize the number of components shared with the model (Path and Manner imitation are correlated), and to follow verbal directions (cf. Experiment 3). Overall, these results suggest that young children have a componential analysis of DM events that parallels the linguistic system.

Symposium Session 1 - Monday 28 July 11.00 - 13.00
Symposium Number – S1-4

Chair: Susan Peppe, *Queen Margaret University*
Discussant: Brechtje Post, *University of Cambridge*

Prosody development: Typical and atypical

Description:
Prosody is the term used to describe manner of speech and tone of voice, conveying such functions as verbal punctuation and stress and indicating the speaker's attitude. It is of increasing interest to researchers in the development of communication abilities in children; it has been proposed that prosody may have an important role in the infant's first attempts to segment the stream of speech that is its first experience of language (the "prosodic bootstrapping hypothesis"), and that a deficit in sensitivity to prosodic differences may impede the development of language abilities in a child. But there has been little research in prosody development after infancy.

With this in view, prosody can be seen as not merely an adjunct to language ability (expressively, in its capacity for making speech more intelligible or persuasive) but also as a crucial facilitator (receptively, as an indicator of linguistic and paralinguistic cues to communication) in the development of language skills. Moreover, prosody is important not only as a factor in strictly lexical and linguistic aspects of communication (e.g. in phonological mapping), but also has a role in the wider aspects of communication, e.g. pragmatics, conversational turn-taking and social mentalising. It is therefore important to investigate the role of prosody in language development after infancy, both in typically-developing children and in children with disorders which involve communication impairment, such as hearing loss, SLI, autistic spectrum disorders, dyslexia, and Williams syndrome.

The proposed symposium, entitled "Prosody development: typical and atypical", brings together many of the main researchers in the field, with contributions from the UK, the USA, the Netherlands and Sweden. The focus of the symposium is on methods of researching children's intonation development (typical and atypical), and on prosody's relationship to language. It includes two papers on the role of prosody in interaction (in a typically-developing child in a family situation and in a child with SLI in a clinical situation) using conversation analysis. A third paper considers multiple measures of the expressive prosody of children with and without typical development, using acoustic measurement and quantitative counts. Three further contributions assess prosodic skills using a prosody test: one paper on regional accent differences in prosodic processing (typically-developing children) and two papers concerned with prosody skills in children with atypical development: one group with Williams syndrome, indicating an atypical prosodic profile in this condition; and one group with cochlear implant, suggesting that low pitch-discrimination is associated with atypical morphological development.

The symposium will thus be considering prosody using several different approaches: a prosody test comprising receptive and expressive tasks using elicited utterances; case study analysis of prosody as a mediator of language in spontaneous conversational turn-taking; and quantitative measurement of particular prosodic factors, such as pitch-range and contours, in spontaneous expressive language. The plenary session will evaluate both the suitability of each approach (or a combination of them) for different situations, and the usefulness and importance of their several findings in the elucidation of the role of prosody in language development.

Prosodic traffic lights at the transition to multiword speech

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The focus of this paper is on how fundamental aspects of English intonational structures and systems are accessed by the child within interaction. We consider the basic structure of the tone unit in English, described by Halliday (1967) in terms of 'head + tonic segment', with variable placement of the tonic (or nucleus).. The research is based on detailed phonetic and interactional analysis of a corpus of audio and video recordings involving a boy, Robin, C.A 1;10 - 2;1, playing with his mother, recorded at weekly intervals.

We argue that the emergence of the basic intonation system is best viewed as the product of mutual orientation by adult and child to a system of prosodic 'traffic lights' that permits the orderly regulation of turn-exchange in a situation where one of the two participants (the child) is producing turns that are otherwise potentially unintelligible due to his linguistic immaturity. A key consequence is that the child is thereby enabled to construct turns of more than a single word or element, thus providing the interactional occasion for transition to multiword speech. First, we show that, stretches of talk produced by the child that lack a major pitch accent, i.e. potential 'heads', (the *red* light) are not treated as complete turns by his mother who routinely waits for a tonic segment before taking her own turn. Second, we show that the construct 'tonic segment' is oriented to by both child and adult as delimiting the end of the turn at talk (the *green* light). Third, we present instances of the mother overlapping a 'tail' produced by Robin, i.e. material that he produces following a tonic. These demonstrate the mother's orientation to the tonic itself as the *yellow* light, projecting upcoming completion of R's turn, even when the accented word (tonic) is not the last bit of speech produced by Robin in that turn. In conclusion, we suggest English intonational structures provide for a system of prosodic traffic lights - a normative system to which participants orient. Our claim is that this normative set of prosodic procedures is particularly salient for young children and those interacting with them. From a developmental perspective, intonation structure is thus the product of interactional contingencies; and a main scaffold of turn construction that enables more complex grammatical and thematic structures to emerge in the child's talk.

In conclusion, we suggest English intonational structures provide for a system of prosodic traffic lights - a normative system to which participants orient. Our claim is that this normative set of prosodic procedures is particularly salient for young children and those interacting with them, because the child at this stage lacks other intelligible means (phonological, syntactic and lexical) to construct clearly delimited turns at talk. From a developmental perspective, intonation structure is thus the product of interactional contingencies; and a main scaffold of turn construction that enables more complex grammatical and thematic structures to emerge in the child's talk.

Regional accent differences in typical prosodic development

Sue Peppe[1], Meriah Kohn[2]
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The role of unfamiliar accent in lexical identification has been addressed by Nathan, Wells and Donlan (1998), while data on the prosodic development of typically-developing children with a southern British accent was collected by Wells, Peppé and Goulandris (2003). Building on that research, this study looks at material using two different UK accents (southern British English: SBE, and Edinburgh Scottish English: ESE). The material covers a range of supralexical prosodic functions: distinguishing questions from statements, two types of prosodically-expressed affect, the place of phrasal breaks and the place of contrastive stress, as well as auditory discrimination of the prosodic forms used to convey the meanings. In particular, it addresses two research questions concerning regional prosodic differences that are relevant to the understanding of receptive prosodic development:

RQ1: Are children more inaccurate or slower at processing prosody and its functions when an accent is unfamiliar? If so, at what age, if ever, does regional prosodic difference cease to slow processing?

RQ2: Do children with the two UK regional accents develop prosody skills at different ages? Do the groups differ on rate of prosodic development?

Method: Participants in the age range 6-13 comprised 48 children with ESE accent listening to ESE stimuli (Group 1); 30 children with SBE accent listening to ESE stimuli (Group 2); and 47 children with SBE accent listening to SBE stimuli (Group 3). Procedures included the receptive tasks of the PEPS-C (Peppé and McCann, 2003) for prosody assessment and the British Picture Vocabulary Scales (Dunn, Dunn, Whetton, and Burley, 1997) for receptive vocabulary.

Results: RQ1: Children in Group 2 did not score significantly lower than children from Group 1 overall, but there was a trend to lower scores and slower response times in the SBE children, suggesting some inaccuracy and slower processing occasioned by the unfamiliar accent. Analysis of variance suggested that although prosody skills improve with age in both groups, the effect of the regional accent factor did not change with age.

RQ2: No significant difference was found between Groups 1 and 3 in scores on five of the six prosody tasks; on the remaining task (distinguishing questions from statements) the SBE group scored significantly better than the ESE group. Detailed analysis shows how the two groups differ at age 6-7 and at age 11-12 in each of the prosodic functions, indicating that the question/statement disparity is in the 6-7 age-group: reasons as to why this should be are explored. Moreover, the ESE group showed greater between-age-group score differences than the SBE group, suggesting a steeper learning curve. The relationship between receptive prosody skills and receptive vocabulary is considered, as is the relationship between auditory discrimination and the ability to distinguish prosodic functions. Between-task differences suggest that distinguishing affect is the earliest of these functions to develop and distinguishing the place of contrastive stress the latest, in both accents.

Atypical prosody in children with Williams syndrome

Jane Setter, Vesna Stojanovik
University of Reading

Background: The aim of this study is to investigate expressive and receptive prosody in a group of 20 children with Williams syndrome (WS) and compare their performance to three groups of children: a group of 14 typically developing (TD) children matched on language abilities (LA group), a group of 11 TD children matched on non-verbal abilities (MA group) and a group of 20 TD children matched for chronological age (CA group). WS is a genetic disorder occurring due to a gene deletion on chromosome 7, which results in an uneven neuro-cognitive profile characterised with a range of cognitive strengths and weaknesses. Despite general learning difficulties, poor visuo-spatial ability and severe deficits in conceptual reasoning, arithmetic and motor control, many individuals with WS present with relatively preserved phonological memory, face processing, aspects of theory of mind and social interaction. Although it was originally reported that prosody is a preserved cognitive skill in WS, albeit over rich in affect intonation (Trevarthen et al., 1998), studies have shown weaknesses in this domain. Reilly, Klima & Bellugi (1990) reported higher use of affective prosody in individuals with WS compared to individuals with Down's syndrome, which was often inappropriate for the context, and in many cases considered exaggerated.

Method: We administered the Profiling Systems of Prosodic Patterns-Children (PEPS-C) (Peppe, McCann & Gibon, 2003), which is based on a psycholinguistic framework and assesses different aspects of production and comprehension of intonation including affect, chunking, focus, turn-end and intonation form (i.e. when no meaning is involved).

Results: The WS group was significantly poorer on all aspects of intonation tested by the PEPS-C battery compared to the CA group. The WS group was no different from the LA group however, apart from one task which assesses imitation of prosody. In comparison to the MA group, the WS group was significantly poorer on the production of affect and on discrimination and imitation of different prosodic patterns. However the WS group was better than the MA group on the production of questioning versus declarative intonation. There were no differences between performance on expressive versus receptive tasks for the tasks assessing intonation function in the WS group, however there was a very strong relationship between the expressive and receptive tasks assessing form. This was different for the typically developing children for whom there was a strong relationship between the expressive and receptive counterparts of two tasks assessing function (chunking and turn end) and one of the tasks assessing form.

Conclusion: Children with WS have an atypical prosodic profile and the results will be discussed with reference to the current debate on the contribution of atypical populations towards our understanding of typical development.

Intonation measures for normal and atypical language acquisition: What can multiple measures tell us?

Heather Balog
Wayne State University

This presentation will summarize current work in the area of intonation analysis for children who are developing language normally and for children who have been identified as language delayed. The data presented will focus on children in the pre-linguistic, first-word, and multi-word stages. Acoustic measures of intonation will be based on the Nuclear Tone Approach to intonation and will utilized measures of accent range (i.e., the changes in pitch that occur on the nuclear tone of the utterance), contour inventory (i.e., an inventory of the number of contour types children produce), and contour maturity (i.e., a comparison of the contours produced by the children to those expected in the adult language). Previous research in this area has shown that measures of contour inventory and maturity reveal differences in intonation production that were not previously found using measures of accent range alone. Application of these measures to determining differences in contour direction, discourse contexts and communicative intention will be presented. The usefulness of these measures with toddlers demonstrating delayed language acquisition will also be presented and compared to data from normally developing toddlers. Implications for future clinical applications will be discussed.

Prosody in Swedish children with language impairment

Christina Samuelsson
University of Linkoping

In a study of prosody in Swedish children with language impairment (LI), it was shown that as many as 41% of Swedish children with language impairment had some degree of prosodic problems (Samuelsson, Nettelbladt & Scocco, 2003). In another study, children with LI in combination with prosodic problems were compared to age-matched controls (Samuelsson & Nettelbladt, 2004). The results showed significant differences between cases and controls regarding all investigated aspects of prosody. In a recent study, prosodic abilities in Swedish children with cochlear implants (CI) were investigated. Preliminary findings show that children with CI have persistent prosodic problems to a greater extent than children with LI.

In a case study of a boy diagnosed with prosodic problems as a part of language impairment, it was found that the language testing activity followed a consistent pattern, i.e. questions with rising intonation, answers with rising intonation and evaluations with a final fall. It was also shown that the boy followed this pattern in spite of his prosodic problems. These results indicate that analysis of prosody in its interactional context is useful in order to reveal possible functions of features that might have been overlooked had a more deficit driven research method been used (Samuelsson, 2007, under review).

In a study of the prosodic structure of the initial part of a language testing activity it is shown that the mean F0 and the pitch range of the therapists resemble the prosody of child directed speech. The mean F0 is high in interactions involving both children with LI and children with typical language development (TL); 273 Hz. The pitch range is also wide in both contexts; 375 Hz. For children with LI, the F0-variation is significantly lower for the test answers than for the other parts of the interactions. For the children with TL, no difference between test answers and other answers, either for mean F0 or F0 variation, was found. For the therapists, the mean F0 is significantly higher in the test questions, $p<.001$, whereas the F0 variation shown by the pitch range, is significantly lower in the test questions, $p<.001$, of interactions involving children with LI. There is also sequential evidence that the therapists prosodically "highlight" certain test questions when the child has language impairment. The children with LI are also orienting to these questions with a similar prosodic package. These results indicate that the prosody of the children with LI is influenced by the prosody of the therapist, even for children diagnosed with prosodic problems. It is also shown the prosody of the specific question-answer activity is carried out with a less varied pitch by all participants.

Acquisition of morphology guided by pitch: Evidence from Dutch-speaking children with cochlear implant

Martine Coene[1,2], Kristin Daemers[3], Paul Govaerts[1,3], Steven Gillis[1], Johan Rooryk[2]
[1]Universiteit Antwerpen, [2]Universiteit Leiden, [3] The Eargroup, Belgium

Several studies have shown that focus constituents are usually prosodically marked by a pitch accent on a word. Moreover, it is natural to place focus on constituents that are informationally novel (Hirschberg 1995). At the same time, newness of information is also encoded grammatically, by means of indefinite noun phrases. The difference between indefinite noun phrases (as in 'Ik heb [$_{+FOCUS}$ een BABY] gezien / I have seen a baby') and definite noun phrases (as in 'De baby [$_{+FOCUS}$ SLAAPT] / The baby is sleeping') is reflected by the presence or absence of a pitch change on the lexically stressed syllable of the noun, combined with a longer duration of the word (+/-10%, Sluiter 1995). Interestingly, in child-directed speech pitch accented noun phrases are significantly less frequent than non-accented ones (Coene, Gillis, Govaerts 2007).

The hypothesis advanced in this study is that the natural acquisition order of functional elements is directly related to the detection of pitch variation, identifying the focus-marked domain. Hearing children are therefore expected to acquire indefinite articles before their definite counterparts, in spite of the relatively low frequency of indefinite noun phrases in incoming speech. This hypothesis is borne out by data from several languages. It is, however, well known that children with a cochlear implant (CI) have difficulty in hearing changes in fundamental frequency. In a previous study, we showed that for young children with CI, elements marked by focus pitch will not be more prominent in running speech than elements that lack such an accent. Their acquisition of morphology will therefore be less guided by local intonation cues and more by frequency: children with CI show a different acquisition pattern with respect to determiners (definites before indefinites).

In this study, we tested deaf and hearing subjects on their perception of pitch-related morphology. The experimental group consisted of a total of 19 deaf adults and 19 deaf children (5-15 years); the control group comprised 30 hearing adults and 19 hearing children (6.5-12 years). Each participant completed two intonation tasks, in which pairs of mono- or bi-syllabic words were to be discriminated on the basis of differences in pitch accent in a same/different setting (natural speech and low-pass filtered items). Intonation discrimination was examined in terms of the type of hearing device and type of stimulation. The results confirm that the cochlear implant users perform significantly worse on the intonation tasks than the hearing controls. We conclude that the low pitch-discrimination ability of children with CI makes them rely more on discourse and cognitive information than on local intonation cues. This is reflected in the fine-grained analysis of determiner acquisition in both hearing and CI populations, that hearing children acquire indefinite noun phrases before definite ones, while children with CI show the opposite pattern.

Indefinite DPs before definite ones, while children with CI show the opposite pattern.

Symposium Session 1 - Monday 28 July 11.00 - 13.00
Symposium Number – S1-5

Chair: Suzanne Quay, *International Christian University*
Discussant: Anat Stavans, *Hebrew University in Jerusalem, Beit Berl Academic College*

Multilingualism as a norm: Insights from trilingual case studies around the world

Description:
A quick calculation of the number of languages in the world (perhaps 6,000) with the number of countries (roughly 200 or more) suggests that many of us are likely to speak more than one language (Ellis, 2005). That multilingualism is the norm can be attributed to: (1) the exigencies of globalization, resulting in more and more families living and working abroad, (2) intercultural marriages, resulting in linguistically mixed families, and (3) the political and economical value attached to multilingual ability. Within these parameters, studying young trilingual children can give us insights into the boundaries within which language acquisition can unfold, thus contributing to an emerging field of inquiry that extends beyond Bilingual First Language Acquisition or BFLA studies.

This symposium brings together researchers from around the world (Basque Country, Germany, Japan, Israel, USA) who are investigating early trilingualism. The children who have been studied range from age one to five. In general, most have been exposed to two languages in the home and to a third outside the home. Data from typologically distinct languages such as Basque, Chinese, English, Farsi, German, Japanese, Spanish and Tagalog are analyzed in various combinations in social interactions within the home and daycare contexts.

This symposium explores the diversity of input in early trilingualism. The first paper investigates the amount and type of input needed for a language to develop in a trilingual child by focusing on the outcome of limited input from one parent in the home setting. The next two papers deal with how qualitatively different input affects proficiency levels leading to dominant versus weaker languages within trilingual children's repertoire. One paper deals with this issue from the perspective of cross-linguistic influences, proposing that these may occur despite different proficiency levels. The other paper deals with the role of peer socialization in language dominance. The last paper proposes that regardless of the number of languages in a child's input (whether two or three), language differentiation occurs at all linguistic levels (phonological, lexical, syntactic and pragmatic). This symposium hopes to shed light on how trilingual children need to be considered as speakers in their own right and to start discussions about whether a distinction is necessary between BFLA and early trilingualism.

The influence of child-directed speech in early trilingualism

Julia Barnes
Mondragon Unibertsitatea, Eskoriatza

Barnes (2006) reported on the relationship between maternal input and a trilingual child's interrogative behaviour in English. The focus in that study was on the increasing complexity of questions, functional proficiency (Davis, 1932; Holzman, 1972; Shatz 1979) and the variety of functions used (Olsen-Fulero & Conforti, 1983; Shatz, 1979). This paper continues to examine the English produced by the English-Basque-Spanish trilingual child in relation to the limited English input she received from ages 1;11 to 3;6.

The child, the youngest of three siblings, has been exposed to three languages since birth. She lives in a part of the Basque Country where the minority language, Basque, is widely spoken and used by her father and his family, who are all native speakers. She also attends a Basque medium kindergarten. Spanish, the dominant language in the community, has always been used with the child by a regular caregiver. Her mother, who is a native speaker of English, always speaks English with her and her brothers. The children address each other in both English and Basque. The parents also use English to each other so it is the language of the home. The child has never been to England but has had a number of visits from English-speaking family members. She was audio and video-recorded every two weeks for one hour over an eighteen-month period in a naturalistic setting with her mother.

The present study explores further the patterns of similarity or difference in the feedback to questions between the trilingual child and her mother, and goes on to identify and describe patterns, unrelated to the interrogative, in which the limited input from one parent

and the home context can be identified in the language of the child. It also identifies areas of cross-linguistic and cross-cultural influence in the child's English and speculates on how they have come to be there. Finally it asks to what extent the parent's background may be influencing the child's discourse skills in situations where input is limited to one parent in the home.

Trilingual cross-linguistic influence

Kerstin Kazzazi
Katholische Universitaet Eichstaett-Ingolstadt

This paper addresses the much-debated issue of cross-linguistic influence in multilingual child language acquisition (see Hamers & Blanc 2000 for an overview). The data come from my son (born 1998) and my daughter (born 2004), who are growing up trilingual with English (the native language of their mother), Farsi (the native language of their father) and German (family and environment language). Diary records were kept for both children from ages 1;0 to 5;0 (the elder child) with situation-focused audio-recordings for the younger child (approximately twice a month from 2,8).

Structural (pre- vs. post specification) and conceptual (semantic) influences have been found to operate in different directions and combinations. In terms of structural influence, German and English are mainly pre-specifying, whereas Farsi is predominantly post-specifying. Both children went through a phase of employing the Farsi post-specifying order for German and English compounds (e.g., Eng. *key-car* 'car-key'; Gm. *Schuhehaus* instead of *Hausschuhe* 'slippers, lit. house-shoes') as well as for possessive constructions (e.g., *Mummy Nicola* 'Nicola's mummy', *Diddy mein* 'my dummy'). This is an instance of one of the three input languages influencing the other two, a kind of minority influence. This finding merits some closer investigation as to the degree to which typological factors may have contributed to this predilection for post-specification. More complex instances will also be presented evidencing transfer of a Farsi possessive construction involving the so-called *ezafe* to English and German, in the process changing the word order (e.g., *Anusheh mal-e poon* 'Anusheh's spoon'). In terms of conceptual influence, semantic concepts are known to be structured very differently cross-linguistically. For instance, English and German converge in having two separate verbs for the intake of food and drink (Eng. *eat, drink*, Gm. *essen, trinken*). Farsi, however, in contemporary everyday speech, has only one verb here: *khordan*. Obviously in an attempt to 'correct' this deficiency, the elder child made use of the so-called *light verb construction* widely productive in Farsi to create a separate expression for the concept DRINK: *nushan kardan* (involving the light verb *kardan* 'to do'). Here, we see a kind of majority influence. The conceptual structure of English and German predominates and leads to assimilating influence on the third language, Farsi. This is particularly relevant within the revived discussion on the Sapir-Whorf-hypothesis (cf. Kazzazi 2007), as it seems to show that, at least in multilingual speakers, there is no one-way linguistic determination of conceptual perception, but rather that a speaker may be both influenced conceptually by his language(s) (in this case be led to regarding eating and drinking as two different concepts) as well as influence his other language(s) by creating a new expression to fit the conceptual grid he has derived from his other language(s).

The data thus seem to show that cross-linguistic influence may be triggered by different factors, and that it is not always the dominant language that exerts influence over the weaker one(s). In trilingual acquisition, there may be different directions and combinations of influence.

Peer socialization and language dominance in trilingual language acquisition

Suzanne Quay
International Christian University

Even when two languages are acquired simultaneously from birth, balanced bilingualism is considered to be rare (Baker, 2006). Therefore, it is not surprising that in studies of multilingual children, we often refer to these children's strong(er) versus weak(er) languages or to their language dominance. The fact that children seem to acquire the language used outside the home in daycare or educational contexts more readily than the home language(s) has led Harris (1995, 1998) to criticize the belief that parents are the most important factor in child development, even in terms of language use. Two earlier case studies in Quay (2001 and forthcoming, February 2008) reported on trilingual development in the home. In both cases, it was not the home languages that were the strongest but the language of the community and the respective daycare centers where both children spent their weekdays.

Both children attended a Japanese daycare center regularly before age one. Video-recordings were made weekly at the respective daycare centers of the trilingual German-English-Japanese boy from ages 1;1.4 to 1;10.8 and of the trilingual Chinese-English-Japanese girl from ages 2;0.13 to 2;4.12. Thirty minutes of each session have been transcribed using CHILDES conventions (MacWhinney, 1995).

While we cannot discount the importance of *both* the peer group and family for multilingual acquisition to take place, it would seem that peers in the daycare environment share socially relevant characteristics such as age, gender, abilities and interests that promote the learning of the third language outside the home. The two children differed in their ability to produce their two home languages as modeled by their parents who followed the one-parent-one-language approach. The child studied after age two demonstrated that in spite of her dominance in Japanese, she was willing and able to converse in her two other languages, Chinese and English, with her parents, while the one studied before age two understood English and German but produced mainly Japanese even in the home (note that the younger child's production was still very limited with a total vocabulary of 88 words in all three languages when the study stopped at age 1;10). This paper focuses on the discourse patterns of the two trilingual children and their peers in the Japanese daycare centers in order to investigate how peer socialization contributes to language development outside the home.

Language differentiation in early trilingual development: Evidence from a case study

Simona Montanari
California State University

Young bilingual children have been found to differentiate their languages from the onset of language production. Several studies have shown that developing bilinguals have separate lexicons, work with differentiated phonological systems, use distinct sets of grammatical rules for each language, and can select language(s) appropriately according to their interlocutor's language use (Deuchar & Quay, 2000; Genesee et al., 1995; Meisel, 1989; Paradis, 2001; Pearson et al., 1995; Petitto et al., 2001). However, relatively little work has been done on language differentiation in children exposed to more than two languages from birth as research on early trilingual development is literally in its infancy (Barnes, 2006; Quay, 2001).

The present study summarizes for the first time four years of research on language differentiation in a child exposed to Tagalog, Spanish and English from birth. The child's trilingual development was followed naturalistically through diary records and weekly recordings in different language contexts from ages 1;4 to 2;6. These data provide the ground to examine the child's ability to build separate lexicons, to differentiate her developing phonological systems, and to use separate sets of syntactic and pragmatic rules for the use of each language. In particular, the following questions are asked: (1) Do translation equivalents produced in early development indicate that separate lexical systems are being built? (2) Do the child's accuracy levels in the pronunciation of Tagalog, Spanish and English words suggest that she can differentiate her developing phonological systems? (3) Do argument/predicate sequences

differentially ordered in Tagalog, Spanish and English indicate that the child is applying different syntactic "rules" in each language? (4) And finally, do her patterns of language choice provide evidence for pragmatic differentiation?

The results indicate that language differentiation – in its various components – is not only possible, but the normal case in early trilingual development. The child in this study appears to be building multiple lexicons, separate phonological and syntactic systems, and distinct sets of pragmatic rules just as – and at the same rate of – developing bilinguals. It is speculated that exposure to three rather than two languages neither hinders nor facilitates language differentiation, and that the biological constraints operating on early language development might be the same for all children, irrespective of the number of languages being acquired.

Symposium Session 2 - Monday 28 July 16.30 - 18.30
Symposium Number – S2-1

Chair: Victoria Joffe, *City University*
Discussant: Marilyn Nippold, *University of Oregon*

Language impairment in adolescents: Psycholinguistic, educational and clinical perspectives

Description:
There is growing evidence of the pervasiveness of early language impairment (LI) and the persistent academic vulnerability that it engenders [1]. These language difficulties have long-term implications not only for academic performance, but also for employment, socialisation and psychosocial functioning. Furthermore, these difficulties not only persist over time, but increase with age and the demands of adulthood [2; 3]. Young adults with LI are a significantly under-researched and under-serviced client population [4].

This symposium addresses this gap in the literature by focusing on the language abilities and educational attainments of secondary aged students with LI (10-16 years) in the UK, USA and Israel contexts. It explores the developmental trajectories and longitudinal outcomes for young people identified with early LI. It considers the associations between language and internal and external factors including cognitive ability, type of schooling, educational attainment and socio-economic status (SES); as well as describes longitudinal predictors for language and educational performance.

The first paper explores the prevalence, nature and type of LI in a cohort of secondary aged students (11-13 years). Details of language and educational performance are collected via a triangulation of perspectives: student, parent and teacher. Consideration is given to the relationships between language and cognition, educational attainment, SES and psychosocial functioning.

The second presentation details the morpho-lexical abilities of secondary aged students in Hebrew. Language targets included derived and abstract nominals and denominal adjectives, two domains central to literacy in adolescence. Results revealed differential effects of internal factors (language levels) and external factors (SES) on language performance.

The next paper explores the predictive relationships between early cognition, language and literacy on later educational attainments. Path analyses revealed a complex model of direct and indirect effects on academic performance; and the longitudinal data is used as a basis for modelling developmental trajectories for students with a history of LI.

The final paper addresses the educational provision of students with LI and quantifies progress in language abilities and educational achievements of secondary aged students attending a specialist school. The paper reports good outcomes for the students, with oral language performance predicting educational attainment.

The symposium chair will draw the themes of the symposium together exploring the relationships, correlates and predictors of early language abilities, literacy, cognition, psychosocial functioning, SES and educational attainments in young people with LI. Methodological issues about the nature of the samples, educational context, variables tested and their moderating effects will be debated. Consideration will be given to the developmental trajectories observed of students with LI into secondary school. Implications for work with this client group, both in research and clinical practice, will be emphasised.

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[3] Conti-Ramsden & Botting, (2004). Social difficulties and victimization in children with SLI at 11 years of age. JSLHR, 47, 145-161.
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Profiling the language and cognitive abilities of secondary school-aged students with language impairments: Perspectives from students, parents and teachers

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Background: Research into language disorders has routinely focused on early preschool and primary development and very limited information exists about the nature and course of language impairment (LI) in adolescence and adulthood (Nippold, 1988). The lack of research activity in this area is reflected in the shortage of Speech and Language Therapy with this client group (Larson et al., 1993). A significant number of secondary school students have language and communication impairments, which impede access to the school curriculum, and have a long-term impact on language, communication and psychosocial functioning in adolescence and adulthood (Clegg et al., 2005).

Aim: This paper reports the findings of a large scale longitudinal project exploring the prevalence, nature and type of LI in secondary aged students in two London Boroughs, from the perspective of the students, their parents and teachers.

Method: Four hundred and sixty one year 6 students (10 years of age) were initially referred to the study by teaching staff who were asked to identify all students obtaining low average or below average scores on the national standard assessment test in English. This is a mandatory assessment for all pupils in England and provides a measure of performance relative to local and national standards of educational achievement. The students were recruited from 2 London boroughs which differ significantly in their socio economic constituents; end of year student performance levels and approaches to special educational needs provision. A total of 21 mainstream secondary schools participated in the study. Detailed assessments of verbal and non-verbal abilities were administered in years 7 (11 years) and 8 (12 years). Questionnaires and semi structured interviews were also conducted to gain the views of the students, their caregivers and professionals on the impact of their LI on school performance and general psychosocial functioning.

Results: Approximately 76% of students initially referred to the study on the basis of their performance on educational assessments manifested with varying levels of difficulty in language. The majority of this cohort was receiving no specialist or additional support for these difficulties. A significant number of participants experienced difficulties with socialisation, self esteem and psychosocial functioning. These difficulties were on the whole reinforced by reports by teachers and parents.

Conclusions: The paper describes the different language and cognitive profiles evident in this cohort and explores the relationship between educational achievement and language ability; as well as the associations between language and other internal and external variables including cognitive ability, socio-economic status and additional specialist support. Implications are drawn about the nature of LI in this population and recommendations are given regarding appropriate assessment and management within the education context.

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Morpho-lexical abilities across school years: The effects of language impairment and disadvantaged background

Dafna Kaplan, Ronit Levie, Amalia Bar On, Irit Katzenberger, Dorit Ravid
Tel Aviv University

Background: Derivational morphology is a major organizing principle of the mental lexicon playing a crucial role in school-age lexical development [1]. The role of morphology in lexical organization is even more prominent in Hebrew, a highly synthetic Semitic language, where spoken and written words are related through their internal components. While morphological knowledge consolidates early on in Hebrew-speaking children, research has found poor morphological skills in two distinct school-aged groups: Children with language impairment (SLI), and children from low socio-economic status (SES) [2]. The current question is whether and to what extent these deficits - which relate i) to cognitive factors internal to the individual, and 2) to external environmental factors – share underlying similarities.

Aim: This study investigates morpho-lexical knowledge in monolingual Hebrew-speaking 4th graders (aged 10-11), and 8th graders (aged 13-14), in three distinct groups: (1) 168 typically developing (TD) children from mid-high SES; (2) 23 children with SLI, from mid-high SES; and (3) 79 TD children from low SES.

Method: Participants were administered in writing seven experimental tasks involving forced choice and production of Derived Abstract Nominals (e.g., *explanation, delivery*), and Denominal Adjectives (e.g., *industrial, effective*). These two domains are known to be central to morphological development in adolescence, and constitute the interface between complex derivational morphology and the advanced literate lexicon [3]. In testing Derived Nominals, we made use of the fact that Hebrew derives a large number of nominals from the same root (e.g., *zikaron* 'memory', *azkara* 'memorial service', *tizkóret* 'reminder', *zéxer* 'memory-trace', and *mizkar* 'memo' – all based on root *z-k-r*). In testing Denominal Adjectives, we addressed two classes of adjectives derived from nouns – Resultative adjectives constructed of root and pattern, e.g., *me'uyash* 'manned' from *ish* 'man, person'; and linear *i*-suffixed adjectives, e.g., *ishi* 'personal' from *ish* 'man, person'. Performance was assessed in terms of both accuracy and error analysis.

Results: Findings indicate that morpho-lexical knowledge increases with age and schooling in all research populations. While children with SLI did significantly less well than the TD mid-high SES group on all, the low SES group demonstrated an inconsistent pattern: On several tasks they scored as well as their peers from mid-high SES, on other tasks they performed on par with their SLI peers, and in other cases they were in between.

Conclusions: These findings raise the possibility that language deficits due to internal factors (i.e., SLI) are more lasting and more durable than language deficits deriving from environmental factors, which might be remediated with proper schooling.

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The role of language and literacy as mediators in the educational achievement of pupils with a history of Specific Language Impairment

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Background: Young people with a history of specific language impairment (SLI) are a vulnerable group. Previous research is limited but the indication is that these pupils have low levels of academic achievement at the end of formal education and increased risk of unemployment in adult life. However the cognitive mechanisms that determine the move from early language difficulties to later academic difficulties remain unclear and have given rise to much controversy

Aims: The current study addresses these issues by examining the academic and literacy attainments of children with a history of specific language difficulties at the end of compulsory education in the UK and examining the extent to which early cognitive, language and literacy scores predict educational achievements. The data are derived from a longitudinal study of a cohort of children identified with SLI at the age of 8.

Method: Sixty-nine children (17 girls and 52 boys) were identified at Time 1 when they were of a mean age of 8; 3 (range 7; 6-8; 10). At age 8 all children were on their schools special educational needs register. Children were traced and subsequently assessed at age 11, 12 (first year of secondary school Time 3), 14 (Time 4) and 16 (final year of compulsory education Time 5). At times 1, 2, 4 and 5 a comprehensive battery of language and literacy assessments were performed. Non-verbal ability was assessed at Times 1, 2, and 4 and literacy and numeracy at time 3. Seven children either declined to be involved at the final stage or were lost to the sample; 62 completed formal assessments prior to leaving school. Additionally we collected data from national assessments, primarily General Certificate of Secondary Education (GCSE) passes in various subjects for 64 children.

Results: As predicted there were significant and large differences between the cohort and the norms for typical young people at age 16 in reading, spelling and writing. Language difficulties continued to challenge the young people. Nonetheless participants achieved a moderate degree of academic success at the end of compulsory education with significant variation in outcome within the cohort.

The relationships between language, literacy and academic performance were assessed concurrently through multiple regressions and longitudinally through path analysis. Concurrent measures of oral and written language explained a large and significant proportion of the variance in academic attainments. Path analyses revealed a complex model of direct and indirect effects on academic performance. Production of written text had direct and significant relationships with academic achievement. Text production was underpinned by previous oral language and spelling skills which indirectly predicted academic achievement. Non-verbal ability had small but indirect effects through intervening variables.

Conclusions: The current data set provide the basis for modelling developmental trajectories for pupils with a history of oral language difficulties. The data point to the specific ways in which individual oral language and literacy skills underpin academic

achievement. The data contribute to our understanding of the ways in which cognitive mechanisms limit the move from one set of abilities to a more complex set of skills.

Are specialist schools effective for secondary-aged pupils with language impairments? Language and educational achievements at Moor House School

Susan Ebbels
Moor House School

Aim: This study quantifies progress in language abilities and educational achievements of secondary-aged pupils attending a specialist school for children with language impairments.
Method: All thirty-four pupils over a three-year period who were in the school at Year 7 (aged 11 years) and left after Year 11 (aged 16 years) participated in this longitudinal study. We tested their language abilities at the beginning of Years 7, 9, 10, and 11 (aged 11, 13, 14 and 15 years) and recorded their educational achievements at the end of Years 9 and 11. Year 9 is when pupils take Standard Assessment Tasks (SATs) in English, Maths and Science. Year 11 is when pupils typically take General Certificates of Secondary Education (GCSEs). However, other options are also available at this stage. Particularly for pupils with additional learning needs (such as language impairments), Entry Level exams may be more appropriate.

Results: At Year 7, all pupils showed receptive and/or expressive language impairments as measured on the Clinical Evaluation of Language Fundamentals-3 (CELF-3). Between Years 7 and 9, the pupils showed highly significant progress in raw scores on all language tests. In addition, their standard scores improved on the overall Expressive Language scale of the CELF-3 and one receptive subtest. Their standard scores on the other receptive subtests, vocabulary (measured on the British Picture Vocabulary Scale - BPVS-II) and phonological awareness (measured with the Phonological Awareness Battery - PhAB) remained stable. Between Years 10 and 11, all language standard scores, as measured on the Test of Adolescent Language (TOAL) improved significantly. However, the change in standard score on the BPVS between Years 9 and 11 decreased significantly.

At the end of Year 9, only 38% of the pupils were entered for English SATs, while three quarters were entered for Maths and Science. However, at the end of Year 11, 65% gained an English, 71% a Maths and 59% a Science GCSE. All other pupils gained an Entry Level qualification in English. All but one pupil gained a qualification in Science and all but two in Maths. A range of more practical subjects are also offered at GCSE level. This ensured that 88% of pupils achieved at least one GCSE and 44% at least five. 63% gained at least one GCSE at grades A* to C (24% gaining at least one A*, the highest possible grade).

GCSE and Entry Level qualifications can be converted into points scores. The total number of points gained and the points gained in English at age 16 were significantly correlated with all language tests carried out at all time points.

Conclusions: During their time at the school, the pupils reduced the gap between their language performance and that of their typically developing peers in most areas, with the notable exception of vocabulary. Pupils' GCSE results are better than might be predicted from their SATs results at age 13. However, all language tests at all time points predict educational achievements at the end of compulsory schooling.

Symposium Session 2 - Monday 28 July 16.30 - 18.30
Symposium Number – S2-2

Chair: Shanley Allen, *Boston University*, Anne Salazar Orvig, *Université Sorbonne Nouvelle*
Discussant: Ludovica Serratrice, *University of Manchester*

The effect of discourse and pragmatics on referential expression: Cross-linguistic and cross-methodological evidence

Description:
Many studies on language acquisition dissociate the structural dimension (the acquisition of grammatical and syntactic paradigms) and the functional dimension (involving discourse, pragmatics, and dialogue). However, recent studies following functionalist approaches stress the intertwining of grammatical and discursive factors in discerning a fuller picture of language development as a whole. This has been particularly true in the domain of referential expression.

A growing number of studies have appeared over the last 15 years investigating the acquisition of referential expression in a variety of languages (e.g., Clancy 1993, 2003; Allen 2000; Serratice 2005; Salazar Orvig et al. 2006). Each of these examines the conditions in which children select different forms of referential expressions in relation to the cognitive accessibility of the referent in question. In general, even children's first uses of referential expressions show their sensitivity to features such as mention in the preceding discourse, the existence of contrasts in the dialogue, and joint attention between the speaker and listener to the referent. Studies which have investigated development have also been able to show which features are most salient from the onset, and that children's sensitivity becomes more adult-like over time. This research leads to the increasingly strong conclusion that the pragmatic-discursive dimension is in essential interaction with the grammar from the outset of language production.

While research in the domain of referential expression has been increasing in recent years, most of this work has occurred in isolation – focusing on only one language or one method or one type of data. In this symposium, we bring together a strong selection of work that purposefully combines a wide range of languages, types of data, and methods in order to further explore the role and universality of the pragmatic-discursive dimension in language acquisition. Paper 1 looks at the relevance of Bahktinian dialogical properties for referential expression in spontaneous speech of two- and three-year-olds in French. Papers 2 and 3 compare the development in children's sensitivity to discourse-pragmatic features in naturalistic speech across two very different languages: monolingual speakers of Inuktitut vs. English in Paper 2, and a bilingual speaker of English and Japanese in comparison with monolinguals in Paper 3. Paper 4 assesses the effect of different types of questions posed by an experimenter on which elements German-speaking children choose to include in their responses. Paper 5 explores whether patterns of referential expression differ in elicited vs. spontaneous speech in Chinese vs. English, and also the ways in which gesture may compensate for arguments which are omitted.

The discussion within and across papers will focus on ways in which information from this wide variety of languages, data types and methods interacts to lead to a fuller and deeper understanding of the role of discourse-pragmatics in the process of development of grammatical sophistication, the ways in which this role is language-universal vs. language-specific, the ways in which this interaction should be explored in other areas of the grammar, and the consequences of these types of observations for models of language acquisition.

Young children's sensitivity to new and known information in answering questions

Dorothe Salomo, Elena Lieven, Michael Tomasello
Max Planck Institute for Evolutionary Anthropology

Children as young as two years old are sensitive to the discourse availability of referents using the immediate linguistic context when choosing referring expressions (e.g., Clancy, 1997; Allen, 2000). One highly special discourse context is questions, since they indicate both what is known to the speaker and which piece(s) of information s/he is seeking. Studies have shown that young children's choice of referring expressions in answers to adults' questions is strongly influenced by whether the intended referent was already lexically given in the question (and, therefore, known to the interlocutor) or not (e.g. Campbell et al., 2000; Wittek & Tomasello, 2005; Matthews et al., 2006). However, those studies focused on a single referent only, which was always a noun phrase. In our study we used a more complex set-up in which we had two referents of interest: a transitive action and a patient. By varying the newness/givenness of these elements in the preceding context and by using a question-type that asked for both of them (predicate-focus question), we investigated how these two factors jointly determine children's answers.

We presented 28-month-old German children with short video clips each consisting of a sequence of three scenes, all showing transitive actions acted out by toy animals. In this sequence of events, all elements remained constant but one. While watching the clips, the first two scenes (context scenes) were verbally described by the experimenter ("AGENT is VERB-ing PATIENT"), whereas during the third scene (question scene) the experimenter asked the child: "What's the AGENT doing now?" There were two conditions: 1) Action-New condition: an agent, does three different actions to the same patient; 2) Patient-New condition: an agent does the same action to three different patients.

We found in the Action-New condition that the children's answers included a verb most of the time (96.9%), while the patient was mainly dropped (75% null referents). However, when the patient was the new element (Patient-New condition), it was expressed most often by a lexical noun phrase (87.5%), but the verb was often included as well (68.8%), though significantly less than in the Action-New condition ($p<0.05$). Thus overall, children provide the new information. Additionally, if they do include given information, this is much more likely to be the verb than the patient ($p<0.01$). Thus, children are responding to the type of question as well as to the given/new dimension since predicate-focus questions pull very strongly for a verb. These findings suggest that in formulating answers to an adult's question, young children are sensitive to what is new information and what is already known information for that adult, based both on the preceding context as well as on the information requested in the question.

Condition	VERB included	PATIENT expressed as		
		Lexical NP	Pronoun	Null Referent
Action – New	96.9%	21.9%	3.1%	75%
Patient – New	68.8%	87.5%	3.1%	9.4%

Speaking and gesturing under discourse constraints in early childhood

Wing Chee So[1], Ece Demir[2], Susan Goldin-Meadow[2]
[1]National University of Singapore, [2]University of Chicago

Young children often omit arguments, whether or not their language permits omission. We ask whether children are sensitive to the discourse conditions under which arguments can be omitted in the language they are learning. We also explore the extent to which children use gesture to compensate for the information omitted in speech (e.g., hold up a toy horse + "you hold" to compensate for the omitted word, "horse").

We approached these questions by investigating spontaneous speech and gesture in 3- to 5-year-old English- and Chinese-learning children. English does not allow speakers to omit words for subjects or objects, regardless of discourse context. Chinese allows omission of both, but only when the omitted elements are retrievable from discourse context. We tested 10 children in each language group under two conditions. In the first experimental condition, children were asked to describe scenes depicting objects moving in space. In the second naturalistic condition, the same children were engaged in spontaneous activities with their caregivers. The naturalistic (but not the experimental) condition allows omitted arguments to be retrievable because they are co-referential with the information mentioned earlier in the discourse unit. We transcribed how often children produced words and gestures for each of the arguments (actor and patient) that could potentially be expressed in a complete sentence (e.g., *woman* twisted *toy*).

We hypothesized that in the experimental condition where discourse context was not available English- and Chinese-learning children would not show significant differences in the rate at which they mentioned arguments in speech. The data confirmed this prediction (Fig.1). English-learning children followed the grammatical rule in their native language, omitting very few actors or patients. Chinese-learning children seemed to understand that argument omission is not acceptable in the absence of discourse context, and also omitted few actors or patients.

In contrast, we hypothesized that in the naturalistic condition where discourse context was available Chinese-learning children would omit significantly more arguments than English-learning children. Preliminary findings support this prediction (Fig.1). Chinese-learning children were more likely to omit actors and patients than English-learning children. All the omitted actors and patients that the children omitted were co-referential with overt nouns produced previously either by the caregivers or the children themselves and hence retrievable from discourse context. There was no significant difference between the mention rates of actors and patients in speech in Chinese-learning children.

The final question we asked was whether the Chinese-learning children conveyed some of the arguments that were not conveyed in speech in gesture. We found that they did but at different rates for actors vs. patients. They produced gestures more often for missing patients (80%) than for missing actors (44%), suggesting that they were sensitive to the dynamics of information flow since patients are often more important to the conversation than actors.

In sum, children are sensitive to the discourse constraints of the spoken languages they are learning. However, they are able to use gesture to selectively express omitted arguments and thus work around the constraints imposed by their spoken language.

Differences in the use of nouns, third person pronouns, and unmarked reference by young children in dialogue

Anne Salazar Orvig[1], Haydee Marcos[2], Aliyah Morgenstern[3], Jocelyne Leber-Marin[1], Jaques Pares[1], Gwendoline Fox[1], Julien Heurdier[1], Stéphane Jullien[1,4]
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This paper presents the results of a study on pragmatic, discursive and dialogical factors that influence children's use of referential expressions. The research focuses on nouns, 3rd person clitic pronouns and unmarked reference in different functions (subject, object, others) used by French speaking children aged 1;10 to 3;0, in natural dialogues.

In contrast with grammatical accounts, studies on the pragmatic-discursive factors influencing the choice of referential expressions (Allen, 2000; Clancy, 1997, Serratice 2005) have shown that pragmatic factors such as accessibility can influence the choice between

overt and null arguments. These studies have been conducted on languages allowing null-subjects, however, work on languages like English (Hughes and Allen 2005) show that even if some discursive-pragmatic features have a predictive value; children adhere very early to the constraint of the obligatory subject.

Studies on narratives by older children (Bamberg 1995; Hickmann 2002) have shown that the choice between pronouns and nouns, both overt arguments, is determined by the thematic progression and the change of thematic foci. For French children aged 4;6 there is a clear correlation between the use of pronouns and the continuation of the thematic subject.

Work on spontaneous dialogues with French speaking children between 1;9 and 3;0 in various situations (Salazar et al. 2004, 2006, 2007) show that third person pronouns and unmarked reference appear massively in the context of shared attention and that they are mainly used for second mentions in situations of discursive continuity.

The aim of the research presented here is to further explore these properties by studying the conditions of choice between nouns, pronouns and unmarked reference in dialogue (considering unmarked reference even when children produce presyntactic utterances).

Longitudinal and cross-sectional corpora of French speaking children between 1;8 and 3;0 (MLU between 1.3 to 6.48) are analysed. The use of pronouns, nouns and unmarked reference (or null arguments) is studied in the course of dialogue, according to the following axes: relationship between the productions of adults and children; rank in the referential chain; continuity or shift in the referential chain; types of dialogical continuity.

Results suggest that other factors than the influence of the form used by the interlocutor might determine the choice of pronouns as opposed to nouns to express immediate referential continuity, namely their position in the referential chain and the type of dialogical moves involved. Shared construction of a thematic sequence could partly explain the use of pronouns and unmarked reference whereas contrast and opposition determine the use of nouns in a referential chain. At the same time, the analysis of the data shows that, in contrast with the use of nouns, the acquisition of 3rd person clitic pronouns is anchored in a more primitive use of predications with unmarked reference.

Developmental effects of discourse-pragmatics and social cognition on argument realization: A comparison of child English and child Inuktitut

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While previous research has demonstrated the effects of discourse-pragmatics on argument realization in null subject languages (e.g., Clancy, 1993; Allen, 2000; Skarabela, 2007) and in non-null subject languages (e.g., Guerriero et al. 2006; Hughes & Allen, 2006), only recently has the role of development been examined (Guerriero et al. 2006; Serratrice, 2005). Therefore, questions still remain as to how children's choice of referential arguments becomes more adult-like over time. This study attempts to address some of these questions by comparing the developmental effects of three discourse-pragmatic features on referential choice in a non-null subject language (English) and a null subject language (Inuktitut).

Both corpora for this study consist of videotaped spontaneous interactions between the children and their caregivers. In total, there are 2194 third person arguments from four monolingual English-speaking children (2;0 - 3;1) (Lieven et al, 2003) and 1185 third person arguments from four monolingual Inuktitut-speaking children (2;0-3;6) (Allen, 1996). Consistent with the hypothesis that cognitive development is a crucial factor in referential choice, the children's utterances were analyzed at two different age ranges: Time 1 (T1: 2;0 - 2;7) and Time 2 (T2: 2;8-3;6). The data were coded for discourse-pragmatic information by a set of three binary features which predict the accessibility of a referential argument (i.e., *absence*, *newness*, and *joint attention*). Each argument was also coded as either null, pronominal (English only), demonstrative, or lexical.

Results for the English data demonstrate that the children's rate of argument omission falls from 24% at T1 to 4% at T2. In Inuktitut, however, the children approach an adult-like omission rate of 67% at (T1). These results suggest that the structural requirement to produce an overt subject in English poses a greater learning task for children. As a result, English-speaking children take more time to approach the adult target.

Furthermore, results show that Inuit children introduce new referents primarily by using null arguments in both stages. In contrast, English-speaking children are more likely to use lexical nouns to introduce new arguments at T1 (56%). At T2, lexical nouns decrease for this purpose, but are still in the majority (44%), while there is an increase in the use of pronouns and, to a lesser extent, demonstratives to introduce new referents. Inuit children also increase in the use of demonstratives to introduce new referents at T2. Moreover, when both groups of children introduce new referents using null arguments, pronouns, or demonstratives, the referent is typically physically present and often the focus of joint attention, as will be discussed in detail in this study.

In summary, children show early sensitivity to discourse-pragmatics and seem to take into account whether or not referents are accessible to their interlocutors; however, they also seem to follow a language-specific developmental trajectory and use various strategies to reflect their sensitivity to discourse-pragmatics according to the typology of the language they are acquiring. This study will discuss the implications of the relationship between language-specific structural requirements on discourse-pragmatic information in the developing linguistic system for two typologically different languages.

Preferred argument structure in bilingual acquisition

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Previous studies have shown that there are statistical relationships among the information status, linguistic form, and grammatical role of arguments (Du Bois, Kumpf, & Ashby, 2003). In spoken discourse, speakers usually introduce only one new argument for each verb and it tends to appear either as the subject of an intransitive verb or as the object of a transitive verb. A given argument, on the other hand, tends to appear as the subject of a transitive verb. In addition, new arguments tend to be represented by lexical forms, whereas given arguments are represented by either pronominal forms (in the case of overt argument languages) or null forms (in the case of null argument languages), resulting in different language-specific patterns. Du Bois (1987) calls this statistical relationship Preferred Argument Structure and suggests that it reflects universal cognitive constraints on spoken discourse.

Speakers and listeners are constrained in the amount of new information they can focus on at any one time because their working memory capacity is limited. Recent developmental studies have demonstrated that Preferred Argument Structure is characteristic of early child language in Korean, Inuktitut, Japanese, and English (Allen & Schröder, 2003; Clancy, 2003; Guerriero, Cooper, Oshima-Takane, & Kuriyama, 2001; Guerriero, 2005). The present study investigated whether children growing up bilingually and learning overt and null argument languages simultaneously would show sensitivity to distinct language-specific Preferred Argument Structure patterns.

The spontaneous language data of a bilingual child and her parents was collected and analysed when the child was between 24 and 48 months of age. The child received English input from her English-speaking father and Japanese input from her Japanese-speaking mother. The data were coded for the informative status of arguments (given, new), linguistic form used (lexical, pronominal, null), and grammatical roles of arguments (subjects of intransitive verbs, subjects and objects of transitive verbs). For comparison purposes, the same features were coded for two age-matched and language-matched English and Japanese monolingual children.

The results indicate that the bilingual child followed the statistical patterns of Preferred Argument Structure both in English and Japanese. She produced maximally one new argument per clause and never placed it in the subject position of transitive verbs both in English and Japanese. Furthermore, she rarely produced more than one lexical argument and tended to avoid using them in the subject position of transitive verbs. She tended to use new and/or lexical arguments either as the object of transitive verbs or as the subject of intransitive verbs. For given arguments, she used pronominal forms in English while using null forms in Japanese. Her Japanese and English patterns were distinct but similar to the patterns exhibited by her parents. Although her language development level as measured by MLU was comparable to that of her monolingual counterparts at 6-14 months younger, her English and Japanese discourse-pragmatic patterns were similar to the patterns seen in the respective age-matched monolinguals. These findings suggest that discourse-pragmatic aspects of language may develop independently from syntactic aspects of language.

Symposium Session 2 - Monday 28 July 16.30 - 18.30
Symposium Number – S2-3

Chair: Yi Ting Huang, *Harvard University*
Discussant: Jesse Snedeker, *Harvard University*

Mastering the intricacies of adjective meaning: Children acquire more than a word-to-property mapping

Description:
The question of how children learn the meanings of adjectives has generated much research in recent years. Most of this work focuses on how children map novel adjectives to object properties. These studies have demonstrated that infants use morphosyntactic knowledge to differentiate adjectives from nouns (Waxman & Booth, 2001) and that toddlers learn adjectives better when they modify a noun that labels the object kind (Mintz & Gleitman, 2002). However, acquiring the meanings of adjectives often involves far more than simply mapping words onto object properties. For example, a scalar adjective like big specifies a scale along which entities can be compared (size) and a pole or region of that scale (greater in size). Nevertheless to extend and interpret these adjectives, children must also set a standard of comparison. Our choice of standard can dramatically alter the interpretation of the term—compare a big house with a big mouse (few acres vs. few inches). Similarly in many languages, proper use of adjectives requires children to distinguish between different types of properties (temporary or permanent, continuous or discrete). These more complex facets of adjective meaning are central topics in theoretical semantics (Bierwisch, 1987; Kennedy, 1999) but have received little attention in the field of language acquisition. This symposium seeks to remedy this by highlighting four lines of work on the acquisition of adjective semantics.

The first two talks explore children's knowledge of different semantic classes of adjectives and their interaction with syntax. Our first speaker explores the extension of Spanish copulas marking the distinction between temporary and permanent states (estar and ser) and finds that children are more conservative in inferring the stative nature of an adjective when comparisons occur within a single individual rather than between distinct entities (e.g., one vs. two skinny/fat cats). Our second speaker asks how children differentiate adjectives whose interpretation depends upon a standard of comparison (big) from those that do not (straight). She finds evidence that two-year-olds can recruit syntactic cues in the input to make this categorization, suggesting that this subtle semantic distinction is made at the earliest stages of word learning.

The last two talks explore how children establish a comparison class for a scalar adjective and integrate this information with the underlying meaning of the word. Our third speaker uses the visual world paradigm to examine children's online interpretation of big and small. She finds that five-year-olds' initially access the polarity of the adjective semantics (e.g., distinguishing big from small) and then subsequently recruit the presence of contrast in the visual scene to predict the relevant comparison class (e.g., inferring big for a coin). Our final speaker addresses the role of statistics in establishing a standard of comparison by examining four-year-olds' interpretations of known adjectives composed with novel nouns (tall daxes). He finds that children are sensitive to the height distribution of the modified category, suggesting that knowledge of the standard of comparison figures into early computations of the meanings of these adjectives.

Form-meaning mappings in the acquisition of the semantics of adjectives

Kristen Syrett
Rutgers University

By two, infants use morphosyntactic cues to identify adjectives. Evidence comes from studies where infants interpret a novel adjective as property-denoting, rather than labeling an individual (Hall 1994; Hall *et al*., 1999, 2000, 2001) or an object kind (Waxman & Booth, 2001; Waxman & Markow, 1995, 1998). Children also decide how to apply real-world knowledge about the object denoted by a noun based on an adjective's syntactic position (Prasada, 1992). These findings demonstrate that children make use of lexical form-class cues to identify adjectives and their relation to nouns. However, since adjectives do not all share the same semantic representation, the same sort of classification issue that arises for noun and verb learning (Bloom, 1994; Brown, 1957; Gleitman, 1990; Katz, Baker, & Macnamara, 1974; Landau & Gleitman, 1985) also arises with adjectives: how do infants identify the correct semantic subclass? We demonstrate that cues, such as adverbial modification, partition adjectives into distinct semantic classes and moreover, that infants recruit such information when interpreting novel adjectives.

Syrett, Kennedy, & Lidz (submitted) demonstrated that three-year-olds know that relative gradable adjectives (GAs) (e.g., *big*, *long*) – but not absolute GAs – depend upon the context to set the standard of comparison and allow the standard to shift with the context, and that absolute GAs can further be divided into those requiring a maximal degree of a property (e.g., *straight*), and those requiring a minimal presence of a property (e.g, *spotted*). These differences are captured abstractly: relative GAs map onto an open scale that allows the standard to vary, whereas absolute GAs map onto a scale closed by (at least) one endpoint that serves as the standard. Interestingly, adverbs highlight these differences. Proportional adverbs (e.g., *completely*) reference a maximal value, while *slightly* references a minimal value, and *very* (an intensifier) is relatively unrestricted:

(1) a. completely #big/straight/spotted
b. slightly #big/?straight/spotted
c. very big/straight/spotted

A corpus search of spoken British National Corpus (>10 million words), shows that there are statistically significant distributional patterns of adverb-adjective bigrams in the exposure language: absolute maximum standard GAs are more likely to be modified by proportional adverbs than relative GAs, and the latter are more likely to be modified by adverbs, but are modified by a narrower range, generally consisting of intensifiers. The results of a preferential looking experiment demonstrate that infants (55 30-month-olds) prefer to assign a novel adjective a relative interpretation (i.e., mapping it to the object property TALL) when it is modified by *very*, but an absolute maximal interpretation (i.e., mapped to TRANSPARENT) when modified by *completely*. They are therefore sensitive to adverb

meanings and their distribution in the exposure language. Crucially, infants pattern at chance in three baseline conditions (no adverb, novel adverb, and the low-frequency intensifier *extremely*).

While such surface-level cues provide a semantic partitioning of adjectives, infants must already have some knowledge of which semantic distinctions are highlighted. We argue that infants expect that adjectives differ according to scalar structure. Further implications are discussed for learning about other lexical items appearing in the nominal phrase.

Big coins versus big plates: The use of referential contrast in children's on-line interpretation of scalar adjectives

Yi Ting Huang, Jesse Snedeker
Harvard University

Adult language comprehension is rapid, incremental, and opportunistic—making use of multiple cues from both linguistic and extra-linguistic sources (MacDonald et al., 1994). In contrast, recent research on early parsing has demonstrated that while children readily use bottom-up lexical cues about the semantics of words, they typically fail to use top-down contextual cues about the pragmatics of a referential scene. For example, five-year-olds prefer the goal interpretation of an ambiguous statement like *"Put the frog on the napkin in the box,"* irrespective of the number of frogs in the visual display (Trueswell et al., 1999). This striking disparity between adult and children's performance suggest that contrast plays little role in children's parsing, however it leaves open the question of whether contextual contrast cues play any role in children's language comprehension.

To explore these questions, we looked for signatures of semantic and pragmatic processing in children's interpretation of scalar adjectives like *big*. These terms are interpreted relative to a standard that can depend upon both the noun which is being modified (*big car* versus *big coin)* and a contextually defined comparison class (*He is tall in Japan but not in Sweden*). In adults, this class often contextually determined, resulting in quick assimilation of pragmatic cues established by the visual scene (Sedivy et al., 1999).

In the present study, we explored whether the presence of a contrast set in the visual contexts influences children's real-time comprehension of scalar adjectives. Using the visual-world eye-tracking paradigm, five-year-olds were asked to "*Point to the big (small) coin"* when presented with displays containing pairs of items which varied in size and belonged either to the same kind or to different kinds (BIG COIN vs. SMALL COIN or SMALL BUTTON). To assess the rapidity of semantic processing, we examined the point at which looks to the Target (e.g., big object) exceeded looks to the Distracter (e.g., small object). To assess children's sensitivity to pragmatic cues, we compared eye-movements to Target in the presence of within category contrast (coin vs. coin) to Target looks in the presence of between-category contrast (coin vs. button).

Semantic effects emerged early; children reliably differentiated the referents of *big* and *small* approximately 400 ms after the onset of the adjective ($p < .05$). Critically, we found that children, like adults, were also able to use pragmatic information in interpreting scalar adjectives. By 600 ms after the onset of the adjective looks to the Target were greater for trials with within category contrast sets ($p < .05$). This demonstrates that children can use from the presence of a contrast set in the visual scene during on-line interpretation. It also suggests that previous failures to incorporate top-down cues cannot solely be due to failure to encode referential contrast or ability to use it during comprehension. Altogether, these results indicate early emerging sensitivity to both semantic and pragmatic information during real-time comprehension. We discuss possible reasons for the disparity between previous and current findings as well as their implications for the development of linguistic architecture.

Do children overuse "estar" or do adults underuse "estar"?

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LINGUISTICS BACKGROUND: The copulas *ser* and *estar* in Spanish are in some contexts logically but not pragmatically equivalent. Two types of information are required to distinguish them: (i) information about the subject of the predication and (ii) information about the time interval in which the predication holds. For example, both sentences in (1) can describe a picture of a skinny cat: (1a) has the implicature that the cat is in a skinny state in the picture and it may have been fat some other time; (1b) has the implicature that this is a skinny type of cat (unless we add the phrase *in this picture,* in which case the generalization is to hold only of the snapshot). (1a) is a safer statement, since it does not make an overarching generalization.

(1) a. El gato esta flaco. ESTAR

b. El gato es flaco. SER
the cat is skinny

ACQUISITION BACKGROUND: Schmitt & Miller 2007 (S&M) hypothesized that that (ii) is harder for children. We showed that children performed basically as adults when they could make a copula choice using only their knowledge of the subject's inherent properties. In S&M and other work, we also showed that when children had to keep track of changing properties, performance was not adult-like in both *ser* and *estar* conditions. However, the experimental situations may have caused the non-adult behavior.

ELICITATION TASK: We modified the task in S&M to an Elicitation task (rather than questions) and simplified the amount of characters and properties. Some children received stories in which the same character acquires some property, and some received stories in which two different characters have contrastive properties (Figure 1and 2).

FIGURE 1: SAME CAT
THIS IN THE SAME CAT. HE ATE SOME MAGIC BEANS AND LOOK HOW HE ENDED UP. DESCRIBE THE CAT. HERE THE CAT _____ AND HERE THE CAT _____.

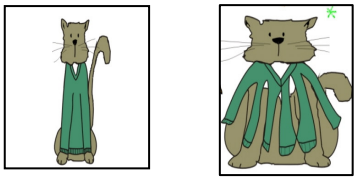
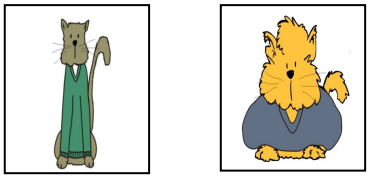


FIGURE 2: DIFFERENT CATS
THEY ARE TWO DIFFERENT CATS. DESCRIBE THESE TWO CATS. THIS CAT ____ AND THIS CAT _____.



Results showed that adults and children use *ser* for the situation with two different cats 97 and 100% of the time respectively. In the same cat situation, however, adults used *ser* 73% of the time for the first picture pointed to them but children only used *ser* 39%. Adults generalized the first picture as representing the permanent property but children did not. The results support Noveck's 2001 idea

that children are more logical than adults, since in the same cat situation they were reluctant to treat the first picture of the cat as its permanent state. They support our hypothesis that adults make different inferences with respect to the evaluation time of stative predicates, which has interesting implications for the study of adjectival predicates.

HOLTEUER'S TVJT tasks also support the idea that children come with various bias towards how to evaluate the truth of adjectival predications in generic and non-generic contexts.

Objects, sets, statistics, and the development of compositional rules

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University of Toronto

Language is powerful because it allows speakers to represent and express ideas that go beyond experience. At the heart of this is the principle of compositionality: simple units of meaning are combined via syntactic rules, resulting in complex expressions whose meanings are predictable from their parts and the rules that combine them. In acquisition, it is often difficult to determine whether children's comprehension of sentences is governed by compositional rules, or by item-specific mappings between word strings and meaning. One test of this knowledge is provided by gradable adjectives, like *big* and *tall*, whose interpretation hinges on the nouns with which they are combined.

What counts as big? Or tall? Or smart? The answer, in each case, depends on the set to which an individual is compared. What counts as tall for a boy is different from what counts as tall for a building or tree – each noun specifies a different standard of comparison. Consequently, children's ability to identify things as tall might lead us to conclude that they deploy compositional rules. However, children might also rely on ostensive definitions of complex expressions, associating expressions like "tall boy" with specific examples in the world, without being able to identify big individuals from a novel set of things. To determine whether children deploy compositional rules, it is necessary to test them with novel nouns and sets.

Previously, we found that 4-year-old children use compositional rules to identify tall and short individuals from novel sets of objects, called *pimwits*. Children readily categorized a subset of 9 objects as *tall pimwits*, and included more objects as tall when additional short objects were added to the original array, indicating that their standard for "tall" shifted as a function of the statistical properties of the set. Further, their calculation of the standard was mediated by linguistic labels. When objects with different physical properties and different names were presented with the pimwits, they did not affect children's judgments. However, when these same dissimilar objects were also called pimwits, they did affect children's judgments.

The study raises two important questions. One is how children calculate the statistical standard, and how this function originates developmentally. What is the nature of this function? Does *tall* mean "taller than average" or "taller than most" or something else? Is there a single statistical function that is deployed by all gradable adjectives, and that is learned once in development, or do children acquire a distinct function for the interpretation of each novel adjective that they learn? The second question is how children come to differentiate gradable adjectives, which categorize individuals relative to sets, from other predicates. I provide evidence from 2- to 4-year-olds' interpretation of *tall* and *short* that they begin acquisition with an object-based semantics for gradable adjectives, and that the transition to a set-based semantics is item-specific. I argue that children's first assumption is that novel adjectives, quantifiers, etc., name object-internal properties, and that they learn, item by item, which words denote relations between sets and individuals.

Symposium Session 2 - Monday 28 July 16.30 - 18.30
Symposium Number – S2-4

Chair: Paula Fikkert, *Radboud University*
Discussant: Aoju Chen, *Max Planck Institute for Psycholinguistics*

Acquisition of intonation: Interfaces with word stress and grammar – Cross-linguistic evidence

Description:
Intonation in early child speech has traditionally been analyzed from a holistic perspective, whereby the whole utterance is the unit of analysis and the contour is described in terms of its overall shape. However, in recent years different researchers have used different methods and/or criteria and investigated different languages, and it is time to take stock and discuss similarities and differences. For example, data from Dutch and Catalan indicate that children have largely acquired the adult inventory of pitch accents and boundary tones before the age of two. Nevertheless there are striking differences in the phonetic realization of some pitch accents and boundary features between children and adults. For example, Dutch children appear to lengthen the utterance-final syllable to a significantly greater extent than adults and they lengthen the utterance-final syllable even when it is not stressed. Do other languages show similar patterns? What is the nature of these differences exactly? Are the differences in phonetic realization caused by children's limited control of their articulators or do they reflect the learning of phonetic details of phonologically distinct contours in their ambient language? This symposium focuses on two interfaces with the development of intonation: word stress and grammar. New data on the development of intonation in Spanish, Catalan, German, Dutch and European Portuguese will be discussed and compared

First, in early child language production the utterance often corresponds to a word-sized unit (the one-word stage). One question that is pertinent to this stage is whether the prosodic structure of the unit reflects intonation, word stress, or aspects of articulation that do not directly bear on any linguistic structure.

Second, at the one-word stage the utterance is not so obviously related to syntactic, semantic or even pragmatic content. How are the intonation patterns to be interpreted during early stages of acquisition? Can the intonation of a one-word utterance be described in terms of pitch accents and boundary tones? Or is it more appropriate to assume that children have unanalyzed whole-utterance tunes at this stage? If so, what are the factors that may drive the development from unanalyzed tunes to analyzed structural components? A related question is whether prosody drives the development of syntax, or vice versa. Research from Catalan, Spanish, Dutch and European Portuguese suggests that intonation contours are acquired before more complex syntactic structures are produced.

Third, although it has been claimed that falling contours are less marked easier to learn than rising contours, it is neither evident from speech perception research that there is a strong preference for falling contours, nor that this preference is found for all languages. Although in many studies on child language production data the falling contour seems to be predominant (as data from German, Dutch and European Portuguese show), Spanish and Catalan children produce both rising and falling contours correctly at an early age. This raises the question where this difference comes from. Moreover, it is of significant interest to regard bilingual learners, such as German-Spanish bilinguals, as they may provide insight into this question.

Monolingual and bilingual acquisition of yes-no questions in Spanish and German: Alignment of pitch accents to stressed syllables and beyond

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Previous studies on the early acquisition of Spanish and German (Lleó et al. 2004) have shown that monolingual Spanish children produce the nuclear H*L as well as the pre-nuclear L*H pitch accents target-like before 3;0 years of age, whereas Spanish-German bilinguals tend to substitute the falling pitch accent for the rising one. This is explained by assuming that the predominant German H*L is influencing their Spanish intonation. H*L is the most frequent pitch accent in German, because the falling accent appears both in nuclear and in pre-nuclear position. Moreover, it has been argued that rising contours are more marked and acquired later than falling ones (Snow & Balog 2002).

Based on this latter assumption and on the fact that German monolinguals before 3;0 already produce the falling pitch accent and Spanish learners both the rising and falling pitch accents, we set out to determine whether the intonation contours of yes/no questions are acquired as soon as those of declaratives in Spanish and German, and whether bilinguals show an interaction between the two languages. The data come from two Spanish and two German monolinguals and two Spanish/German bilinguals (aged 2;6-3;0).

Intonation analyses of yes/no interrogative utterances by adults (Batlinger 1989, von Essen 1964 for German, Face 2005 & 2006, Navarro Tomás 1974 for Spanish) distinguish four points in each language that are relatively comparable as far as their F0 values, and correspond to four cues in Spanish, and to two cues in German. In Spanish, after a beginning that is characterized either as higher or as lower than that of declaratives, and a following peak, there appears an L and a final H. In German, the beginning and the following peak of yes/no questions appear to not be distinguishable from those of declaratives. Only the last part of the contour, characterized by L and final H signals a yes/no question. However, there are crucial cross-language differences as far as the alignment of such L and H tones to the corresponding syllables are concerned, the final rising contour being much steeper in Spanish than in German, as L is aligned with the final stressed syllable in Spanish, but with an earlier syllable in German.

Against the background of these analyses, the present paper focuses on the production of the interrogative cues in children's data and poses the following questions: Do monolingual children produce all different F0 points in a conjoined manner, or are certain points produced earlier and independently from the others? Do bilinguals show the same patterns as monolinguals? Does the final steep F0 rise of Spanish pose difficulties? The acoustic analyses of F0 and its alignment show that monolingual children have acquired both the F0 contour and the alignment of the four crucial points before 3;0, whereas bilinguals tend not to differentiate between the two languages, arriving at compromising solutions. Interestingly, one child tends to show the German values and the other child the Spanish values in their two languages.

The intonation of one-word and first two-word utterances in European Portuguese

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University of Lisbon

Early intonational development in European Portuguese (EP) is largely unstudied. Prior work focused only on overall contour shape (Frota & Vigário 1993, 1995), and showed a high proportion of falling contours between 0;6 and 2;0 (both in babbling and words), while rising contours appear later and are relatively infrequent. However, in prior work the structural properties of the target language intonation system, or the pragmatic meaning of early utterances were not taken into account. In this study we analyse the intonation of one-word and first two-word utterances of one monolingual EP child aged between 0;9 and 2;6 in the autosegmental-metrical framework. We will address three questions: (1) Is the inventory of pitch accents and boundary tones adult-like?; (2) Does the child master the alignment and scaling properties of tonal events?; (3) What does intonation tell us about the prosodic properties of early utterances (namely word stress and prosodic phrasing)?

The empirical database for this study is a longitudinal corpus consisting of every other week videotape recordings of about 60 minutes each (Laboratório de Psicolinguística, FLUL), and a corpus of audio recordings made on a nearly daily basis (Laboratório de Fonética, FLUL). Meaningful one-word and two-word utterances are identified on the basis of their relation to adult words, and their appropriate and consistent use (Snow 2006). For each utterance, the following annotations are made: (1) orthographic and phonetic transcription; (2) utterance type and pragmatic meaning; (3) prosodic transcription (including intonational analysis and prosodic phrasing); (4) main differences between the child and the adult pattern. The prosodic analysis was guided by the description of EP prosody in Frota (2000, 2002) and Viana and Frota (2007).

Preliminary results based on the analysis of data from 0;11 to 1;9 (utterances are still one-word and the child has a vocabulary size of 30 unique words) show a first stage where adult-like tonal shapes are present in the contour but both alignment and scaling are not mastered: for example, in the declarative fall contour HL* the fall is pushed to the end of the word and the final L is realized higher. From 1;2 onwards, the first instances of adult-like alignment and scaling of HL* appear, at the same time as word stress is clearly marked with duration. At 1;6 most HL* contours are aligned and scaled in a adult-like fashion. The first cases of use of the focus contour H*L appear at this age. However, the focus contour apparently involves stress shift in disyllabic oxytones, while other contours with similar tonal crowding effects are realized in an adult-like manner (e.g. the insistent request contour LH*L%, or the question contour HL* LH%). At 1;9 the child not only seems to show the adult inventory of tonal events for the range of contours produced (declaratives, requests, questions and the calling contour), but also has no major difficulties with their realization. These results do suggest that by 1;9, and before two-word combinations are produced, an important part of the target language intonational grammar is already acquired.

Is prosodic development correlated with grammatical development? Evidence from emerging intonation in Catalan and Spanish

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Recent studies on prosodic development have claimed that substantial advances in the acquisition of intonation cooccur with more general changes in grammatical development (Snow 2000; Snow & Balog 2002; Snow 2006). As Snow (2006:294) points out, "the milestone event in children's acquisition of expressive syntax is the appearance of two-word combinations at about 18 months, which coincides exactly with the dramatic growth in intonation that was observed in this and other studies." Yet contrary to what has been claimed in the literature, Prieto & Vanrell (2007) found that four Catalan children mastered the production of a wide variety of language-specific pitch accents and boundary tones well before they produced two-word combinations, regardless of the fact that the age of the start of two-word production was 1;6 for two of the children and 2;0 for the other two. The fact that these children have an important knowledge of intonational grammar well before they produce two-word combinations casts doubt on the hypothesis that children's development of grammar coincides in time with the development of intonation and leads to think that prosodic and melodic development occurs before grammatical development.

Recent studies on infant perception have revealed that the prosodic analysis of the speech signal may allow infants to start acquiring the lexicon and syntax of their native language and thus that prosody serves as a 'guide' for lexical and syntactic acquisition (Morgan & Demuth 1993, Nespor et al 1993, Cristophe et al 1997, Cristophe et al 2003, among many others). Extrapolating on the prosodic bootstrapping accounts of syntactic and lexical acquisition to the production realm, it would be expected that there is a positive correlation between prosodic development and grammatical development. Yet it is still an open question whether prosodic production abilities in children are paced in some way with grammatical and lexical development, even if they are discontinuous in time.

In this study, we assess in more depth whether the mastery of certain intonation patterns is correlated with grammatical and lexical development. The study investigates early intonational development in Catalan and in Spanish, focusing on the relationship between lexical and grammatical development and the development of intonational grammar. The primary empirical basis for this study is an extensive longitudinal corpus consisting of the transcribed speech of four Catalan children, coming from the Serra-Solé corpus available in CHILDES, and of two Peninsular Spanish children, coming from the Ojea corpus and the López-Ornat corpus in CHILDES). Apart from one of the most widely used indices of language development and grammatical complexity, namely the Mean Length of Utterance in morphemes (MLUm) or words (MLUw), we will use a measure of lexical development that measures frequency and type of word appearance. Following recent work on infant perception, our hypothesis is that precocious expression of intonation patterns will be an indicator of early syntactic and lexical development.

The prosodic structure of Dutch one-word utterances: Intonation or word-stress?

Paula Fikkert, Aoju Chen
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The most common pitch accent type in Dutch children's early two-word (mostly declarative) utterances is H*L, high on the stressed vowel and low on the following unstressed vowel (Chen & Fikkert 2007). Furthermore, studies on word stress patterns in early child language have shown that Dutch children's disyllabic words predominantly have a trochaic pattern (Fikkert 1994, among others). Perceptually, the trochaic pattern and the H*L pitch accent are very similar. As both word stress and sentence accent are largely expressed by the same acoustic means (e.g. f0, duration and intensity), it is not easy to determine whether the prosodic prominences attested in children's productions are due to word stress or sentence accent in early child language.

In this paper we report on our investigation, which aims at disentangling both aspects of early knowledge of prosodic structure by investigating the comprehension of word stress in different intonational conditions. In perception, sensitivity to patterns of word stress is necessary for the identification of word boundaries in spoken language, which in turn are essential for constructing phonological representations. Children have been shown to be able to segment both trochaic and iambic words from the speech stream by the end of the first year (e.g. Jusczyk et al. 1999, Houston et al. 2000) and they could use this ability to recognise known words.

De Bree et al. (2007) has shown that Dutch 3-year-old children are more sensitive to stress mispronunciations in target trochaic words than in iambic words, suggesting a preference for initial stress. 3-year-olds already have substantial knowledge of the words and sounds of their language, while 14-month-olds are beginning word learners and are still developing their inventory of word stress patterns and intonational contours.

Therefore, our investigation focuses on word recognition in 14-month-old infants. Using a visual fixation paradigm, we present children known trochaic and iambic target words, which are either produced with correct or incorrect word stress. Furthermore, these words are embedded either in a carrier sentence requiring a question intonation (L*H H%), (e.g. Zie je het konijn? '*Do you see the rabbit*?'), or a statement intonation (H*L L%) (e.g. Kijk naar het konijn! '*Look at the rabbit*'. The intonation is either appropriate for the carrier sentence, or inappropriate. In all sentences the pitch accent is realised on the syllable with word stress in the sentence-final noun.

If children have both knowledge of word stress and knowledge of intonation, they are expected to recognise known words in different intonation conditions (i.e. contextually congruent vs. contextually incongruent), but the looking times in the incongruent intonation condition are expected to be shorter. Moreover, we expect them to look longer at the words produced with correct word stress than to those with mispronounced word stress. However, it may also be the case that asymmetries arise, if children prefer to listen to default stress patterns (i.e. trochaic words), whether they are congruent or not. There is no evidence suggesting that one intonation pattern is more appealing than the other.

Symposium Session 2 - Monday 28 July 16.30 - 18.30
Symposium Number – S2-5

Chair: Laura Wagner, *Ohio State University*
Discussant: Laura Wagner, *Ohio State University*

The origins and development of sociolinguistic competence

Description:
Complete acquisition of a language requires knowledge not only of a particular grammar and phonology but also of how subtle differences in grammar and phonology can signal social information. The field of sociolinguistics in general has shown that adults are acutely aware of how linguistic variation can signal factors ranging from geographic origin to social desirability. How and when children become aware of the many social functions of language is less clear. This symposium brings together four papers looking at children's competence with various types of sociolinguistic knowledge, including those just noted. Collectively, these papers show that some underpinnings of sociolinguistic ability are present in infancy, but that it takes several years for children to become facile at using and understanding a full range of social dimensions of language use.

The first paper explores the origins of sociolinguistic competence by asking whether infants are sensitive to the most basic sociolinguistic concept: How someone talks have social consequences beyond the simple meanings of their words. This work shows that infants prefer to accept toys from people who speak their native language. Moreover, language appears to trump race in this task, suggesting that language is a primary element to social categorization.

The next two papers look at children's ability to use and to understand linguistic markers of social style/register. An important dimension of sociolinguistic competence is being able to adjust the way you speak depending on your interlocuter and your social situation. The second paper examines children's productive use of style/register markers as they emerge and develop in a fairly naturalistic context. The third paper looks at children's ability to interpret style/register markers in a comprehension context. These papers suggest that 3 year old children have only a crude notion of how to produce register/style differences in their own speech and little idea of how to interpret adult-like cues. Both production and comprehension abilities improve dramatically over the next two years of children's development.

The final paper is concerned with children's facility with different accents, both in terms of their ability to understand words produced in an unfamiliar accent, and in terms of their ability to mimic an unfamiliar accent. This line of research is concerned with the

basic processes needed to deal with accent variation and by extension, with distinguishing one's own regional way of speaking from those of outsiders.

The native language of social cognition

Katherine Kinzler
Harvard University

From birth, humans display a remarkable sensitivity to language and linguistic differences. Neonates prefer their native language to a foreign language, and even discriminate two foreign languages provided that they have sufficiently different rhythmic properties.

The present paper describes new research providing evidence that (a) infants demonstrate social preferences for novel individuals who speak infants' native language with a native accent, and (b) these early social preferences for native speakers surpass those based on race. Experiment 1 investigated infants' early looking preferences towards native speakers, finding that infants prefer to look longer at someone who spoke in a native language compared to a foreign language, as well as a native accent compared to a foreign accent (Kinzler, Dupoux, & Spelke, 2007). Experiment 2 attempted to test infants' social preferences for native speakers more directly. In this study, 10-month-old infants saw movies of a native and a foreign speaker each speaking, and then, silently and in synchrony, holding up two identical toys and offering the toys to the baby. Just at the moment at which the toys disappeared off screen, two real toys appeared for the baby to grasp, giving the illusion that they came from the screen. Infants reached for the toys offered by the native speaker, though the toys were identical and the interactions non-linguistic in nature. In Experiment 3, 30-month-old children demonstrated giving behaviors selectively toward native-language speakers. In Experiment 4, 5-year-old children demonstrated explicit social preferences for speakers with a native accent, and these preferences were not do to the intelligibility of the speech. Thus, attention to the language and accent with which others speak plays a critical role in infants' and children's early social reasoning.

A remaining question concerns whether social preferences based on language are primary, or whether children's early social interactions are equally influenced by any dimension of social familiarity. Though previous research shows that young infants display looking preferences towards own-race individuals, when 10- and 30-month-old infants were tested with the same measures of social exchange as described above, they did not use race to guide their early social behaviors. In contrast to the effects observed with language, infants accepted objects from, and gave objects to, both own and other-race individuals equally. Research with older children suggests that the predominance of social attention to language over race does not dissipate throughout development. Though 5-year-old children display robust race-based social preferences when two speakers were silent, their preference reversed with the own-race person spoke with a foreign accent. Thus, attention to linguistic differences among individuals, rather than racial distinctions, may play a primary role in the development of infants' and children's early social reasoning.

Though in evolutionary times, groups separated by a small geographic distance did not differ in physical properties such as race (Kurzban, Cosmides, & Tooby, 2001), they may have spoken with different languages or dialects. Children, therefore, may attend to social factors that were important indicators of group membership throughout cognitive evolution.

Acquisition of style and register

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Style and register are generally treated as quite different phenomena in sociolinguistic research. Style is often conceptualized as a continuum, either from formal to informal or from more to less attention paid to speech. Register, on the other hand, is often described as role dependent. The resulting role-related feature constellations are not well captured by a continuum even though some of the features may overlap with those associated with a particular style.

Sociolinguists and psycholinguists have addressed the acquisition of register and style, but rarely both together. In their groundbreaking study, Shatz and Gelman (1973) found that 4-year-old children adopted some of the features of the Child Directed Speech (CDS) register, including pitch changes and language simplification when talking to 2-year-olds. Similar findings have been noted in studies of working class children (Miller and Garvey, 1984) and in cross-cultural studies (Watson-Gegeo and Gegeo, 1986). In contrast, studies of acquisition of speech style, as defined by formality measures, have suggested that these features are acquired later, after the age of 4 or 5 (Labov, 1989) and after the acquisition of variation based on linguistic constraints (Roberts, 1997).

In spite of the disparity in age of acquisition and the tendency for researchers to focus on one or the other, there are reasons for looking at style and register together. Various formality-related characteristics usually relegated to style descriptions are often found in register distinctions as well. In addition, Andersen (1990) found that although there was evidence of gross register-related changes in her youngest children, it was not until the age of five that children began to show differentiated "sentence structures, lexical items, and phonological features to fit the different roles in their sociolinguistic repertoires" (1990:159).

The aim of the current study is to explore several linguistic features in ten children aged 3 and 4, engaged in non-role- and role-based play in groups of two to three. Toys, such as puppets, a doctor kit, a toy kitchen, telephones, and a play house with characters were utilized to encourage pretend play and register use. These sessions were tape recorded and coded for use off the following features: pitch changes, use of specialized vocabulary (e.g. diminutives) and the alternation of (ing) (i.e. [In] vs. [Iŋ]. The data were also coded for differential use of any of these features based on listener (child or adult). Results revealed that the youngest of these children confined their use of register/style features to the simplest changes (e.g. use of a "squeaky" voice to indicate almost any role change). However, the older children showed signs of distinctive use of (ing) in both more classic register changes as well as changes in listeners. It is suggested that register may be seen as a type of "proto-style" with its simplest most overt features emerging first within the context of pretend play before becoming the more complex style and register system found in adult speech community members.

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Children's developing comprehension of social register

Laura Wagner, Maia Greene-Havas
Ohio State University

We talk differently to different people. We adjust our speech lexically, morphologically, phonologically, and intonationally depending on the social relationship we have with our listener. Making these linguistic adjustments requires a command of the specific linguistic elements involved, a facility in recognizing the relevant social relations involved, and an appreciation of the links between the two.

Previous work has largely focused on children's own ability to produce different registers (e.g. Andersen 1990). However, it is likely that children can understand and interpret such information long before they can reliably adjust their own speech. The aim of this study was to investigate when children can interpret social register information in a comprehension task.

This study tested 69 pre-school children (20 3-year-olds, 25 4-year-olds, and 24 5-year-olds) acquiring English. Children were introduced to a puppet who wanted to meet new people. Pictures of four new people were presented simultaneously on cards: a teacher (an adult woman), a baby (an infant), a female peer (a little girl described as living nearby) and a female foreigner (a little girl dressed in a Mexican flag described as living very far away). Using pre-recorded audio stimuli, the puppet addressed the group of pictures in one of three linguistic registers and asked the person what her name was. The three registers were the following: Motherese ("Ooooo, I wonder what your name is?"), Polite ("Excuse me please, what is your name?"), and Casual ("Hey. What's your name?"). In addition, the question was asked in Spanish ("Hola, Como te llamas?"); this item served as a control for children's general ability to use linguistic differences to choose among potential interlocuters. The order of the linguistic stimuli was counterbalanced across subjects. The child's task was to indicate who the puppet was talking to. In addition, older children were also asked to justify their answer.

The results showed that 3-year-old children were unable to use any of the information to help them select a picture, scoring at chance with all linguistic cues, including all the registers as well as Spanish. The 4-year-old children were able to link the non-native language, Spanish, with the foreign girl ($t(24) = 2.24$, $p < .034$), but were unable to distinguish among the registers within their own language. By contrast, the 5-year-olds were able to succeed with all items, including, all registers ($p < .025$ for all items). Preliminary analyses of the justifications of these older children, however, suggest that they have little appreciation of why they make the choices they do.

These results suggest a developmental trajectory for children's ability to link linguistic differences to social differences, in which children gradually become dramatically more sophisticated in their ability to consider the links between linguistic and social information around the age of 5 years.

How do children handle unfamiliar regional accents?

Bill Wells, Samantha Lamb
University of Sheffield

Developmental sociolinguistic studies have addressed the question of how children accommodate to a new accent when they move to a new region. However, even for children who do not move geographical areas in that way, the ability to handle unfamiliar accents, including regional accents, is important, educationally (e.g. understanding teachers) and more widely, socially and culturally (e.g. understanding movies). An ability to reproduce an unfamiliar accent is also a socially relevant skill, since mimicry (often humorous) of others' accents is a component of spoken interaction, e.g. reported speech. Our research programme has used an experimental approach to investigate the following topics:

Relationship between perception / comprehension and age

- Is there an effect of age on children's comprehension of words spoken in an unfamiliar regional accent?
- Are there age-related developmental changes in the way in which children process and interpret words spoken in an unfamiliar accent?
- Does the effect of linguistic context on accent comprehension change with age?
- Is there a relationship between children's ability to comprehend an unfamiliar accent, and their meta-awareness of accent differences?

Relationship between perception and production

- Are children with developmental speech (output) difficulties less accurate when processing an unfamiliar accent, compared to typically developing children?
- Is there a relationship between children's ability to perceive /comprehend an unfamiliar accent, and their ability to reproduce it accurately in their own speech?
- How do the abilities to comprehend and reproduce unfamiliar accents fit into a wider picture of the development of speech and speech processing in children?

In this paper, we will briefly summarise findings from earlier studies that address the first five questions above, using data from London children listening to a Glaswegian accent. New data and results will then be presented that address the last two questions in particular. Children from a primary school in Leicester (East Midlands of England) C.A. 5; 5 – 6;4 were given tests of accent comprehension and mimicry tasks using stimuli spoken in a Northern Irish accent, and three phonological awareness tasks. There was no correlation between performance on the two accent tasks, suggesting that accent comprehension and accent mimicry are not related skills. However, there were positive correlations of accent mimicry (but not accent comprehension) with rhyme detection and also with word completion. The implications of these results for a model of accent processing in children will be explored.

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00
Symposium Number – S3-1

Chair: Sheena Reilly, *Murdoch Children's Research Institute*
Discussant: Philip Dale, *University of New Mexico* ; Bruce Tomblin, *University of Iowa*

Predictors, prevalence and natural history of language outcomes in a community cohort of Australian children: The Early Language in Victoria Study

Description:
In this symposium we will present results from the Early Language in Victoria Study (ELVS), a prospective, longitudinal study based on a community cohort of over 1900 children whose language development has been followed from 8 months- 4 years.

The presentations in this symposium will a) report the prevalence of language impairment, giving consideration to different definitions and cut-offs; and b) explore relationships between language development outcomes (both 'precocious' and 'impaired') and psychosocial factors (child, parent and family factors).

We will explore the theoretical and clinical/public health implications of our findings in relation to definitions and predictors of language development. We will begin with an overview of ELVS, including the sampling, methods of data collection and results from previous analyses of 12 month and 2 year old data, examining predictors of language development. The subsequent papers will focus on language outcomes for children at 4 years of age, but will include data from earlier years.

The early language in Victoria study: A prospective, longitudinal, community study

Sheena Reilly[1,2], Edith Bavin[3], Lesley Bretherton[4,2], Patricia Eadie[1], Margot Prior[2], Obioha Ukoumunne[2,1], Melissa Wake[1,4], Joanne Williams[1,2]

[1]Murdoch Children's Research Institute, Australia, [2]University of Melbourne, [3]La Trobe University, [4]Royal Children's Hospital

The Early Language in Victoria Study (ELVS) is a prospective, longitudinal study of a community cohort of children in Victoria, Australia. The overall aim of ELVS is to study the epidemiology and natural history of language impairment in children, including the identification of early predictors of language impairment. This paper will describe the study including recruitment and data collection procedures and early results, in order to provide a background to the papers that follow which focus on our recent findings.

In 2003, 1911 children were recruited from six of the 31 local government areas (LGAs) in greater metropolitan Melbourne. A census-based measure of socio-economic status (Socio-Economic Indexes for Areas- SEIFA) was used to stratify the 31 LGAs into three tiers. Two non-contiguous LGAs were randomly selected from each tier to ensure ELVS sampled from areas across the spectrum of disadvantage. In Victoria 82% of families attend a free of charge infant health care visit at 8 months of age. Families were invited to participate in ELVS when attending this check at their local Maternal and Child Health centre. The cohort included almost equal numbers of boys and girls (49.5%). 6.6% of participating families were from non-English speaking backgrounds.

Five waves of data collection have been completed. Data collection was by parent-completed questionnaires at 8, 12, 24 and 36 months. These questionnaires included validated parent report measures of communication and language skills (e.g., Communication and Symbolic Behaviour Scales; MacArthur-Bates Communicative Development Inventories). In addition, demographic information and a broad range of child (e.g. temperament, behaviour) family (e.g., maternal mental health, maternal education level, family history of speech and language difficulties) and environmental (e.g., main language spoken at home, SES) were obtained. Language measures were also collected face-to-face with a sub-sample of children at 12 months of age and with the entire sample at 4 years of age. This presentation will include a description of the characteristics of the cohort. Findings from previous data waves will be summarised including the predictors of communication and vocabulary development, and 'late talking' outcomes to 2 years of age (Reilly et al., in press; Reilly et al., 2006).

References:

Fenson, L., Dale, P., Reznik, J.S, Thal, D., Bates, E., Hartnung, J.P et al, (1994). *MacArthur-Bates Communicative Development Inventories*. Baltimore: Paul H. Brooks

Reilly, S., Eadie, P., Bavin, E. L., Wake, M., Prior, M., Williams, J., Bretherton, L., Barrett, Y., & Ukoumunne, O. C. (2006). Growth of infant communication between 8 and 12 months: A population study. *Journal of Paediatrics and Child Health, 42*, 764-770.

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Wetherby A, Prizant B. (2002). *Communication and Symbolic Behaviour Scales*. Baltimore, MD: Paul H. Brookes Publishing Co.

Identifying language impairment: The challenge

Edith Bavin[1], Joanne Williams[2,3], Melissa Wake[2,3], Obioha Ukoumunne[2], Sheena Reilly[2,4], Margot Prior[4], Patricia Eadie[2], Lesley Bretherton[3,4]

[1]La Trobe University, [2]Murdoch Children's Research Institute, Australia, [3]Royal Children's Hospital, [4]University of Melbourne

Drawing on the ELVS sample, this paper will report the number of children identified as language impaired at age four. The main focus will be the application of the different criteria used for identifying specific language impairment (SLI), reported in both research and clinical contexts. In research contexts discrepancy scores between language and non-verbal IQ are typically used to identify children with SLI. For example, Tomblin et al. (1997) proposed that a cut-off score of 1.25 standard deviations below the mean for language measures and a non verbal IQ of 85 be used. However, cut-off scores used by different researchers can range from 1 to 1.5 SDs below the mean on one or more language measures. Although useful for research purposes, using a discrepancy between non-verbal performance and language performance has been questioned since the language features observed in SLI are similar to those for children with a low non-verbal score between 70 and 85 (non-specific language impaired, NLI), and clinically both groups may be treated similarly. However, it is also important to be aware of the history of any language problems of an individual (eg, late talking) particularly when identifying the phenotype and patterns of heritability, as argued by Bishop (2004).

Using the Clinical Evaluation of Language Fundamentals – Preschool (Australian Version; Wiig & Secord, 2006), the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 2005) for screening, we report on the prevalence of language impairment in the ELVS sample using (1) a cut-off of 1.25 SDs below the mean on language scores and (2) a cut-off score of 1.5 SDs. We also report the outcomes for children identified as SLI and NLI using the standard criteria, and document the history of these two groups, including how many in each group were late talkers at age two, based on their scores on the MacArthur-Bates Communicative Development Inventory: Words and Sentences (Fenson et al, 1994). The overall findings will be discussed in relation to arguments about using different criteria for identifying language impairment.

References:

Bishop, D. V. M. (2004). Specific language impairment: diagnostic dilemmas. In L. Verhoeven & H. Van Balkom (Eds.), *Classification of Developmental Language Disorders* (pp. 309-326). Mahwah, N. J.: Erlbaum.

Fenson, L., Dale, P., Reznik, J.S., Thal, D., Bates, E., Hartnung, J.P. et al. (1994). *MacArthur-Bates Communicative Development Inventories*. Baltimore: Paul H. Brooks.

Kaufman, A., & Kaufman, N. (2006). *Kaufman Brief Intelligence Test* 2nd Edition. Pearson Assessments.

Tomblin, J.B., Records, N.L., Buckwater, P., Zhang, X, Smith, E., & O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children, *JSLHR, 40*, 1245-1260.

Wetherby A., & Prizant B. (2002). *Communication and Symbolic Behaviour Scales*. Baltimore, MD: Paul H. Brookes Publishing Co.

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Predictors of language impairment at 4 years: Data from the early language in Victoria study

Patricia Eadie[1], Edith Bavin[2], Lesley Bretherton[3,4], Margot Prior[4], Sheena Reilly[1,4], Obioha Ukoumunne[4,1], Melissa Wake[1,3], Joanne Williams[1,3]

[1]Murdoch Children's Research Institute, Australia, [2]La Trobe University, [3]Royal Children's Hospital, [4], University of Melbourne

This paper will draw on data from ELVS to examine the contributions of putative child, family and environmental risk factors to language outcomes at age 4 years. Participants are a community-ascertained sample of 1900 infants recruited at age 8 months and followed at ages 12, 24, 36 and 48 months.

Outcome at 4 years was determined by face-to-face assessment. Approximately 1600 children were assessed by a trained research assistant to determine language outcome (i.e., typical development or language impairment), as well as measure nonverbal cognition, speech development, and emerging phonological awareness. The Clinical Evaluation of Language Fundamentals – Preschool (CELFP-2 Australian Version; Wiig & Secord, 2006), the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 2005) and the Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 2000) were the standardised measures used.

Putative risk factors included in the analysis were based on the US Preventative Task Force (Nelson et al., 2006) as well as prospective data (e.g., language) collected from 8 months to 4 years on all ELVS participants. Potential predictor variables include gender, prematurity, birth weight, multiple birth, birth order, socio-economic status, maternal mental health, maternal vocabulary and education, maternal age, non-English speaking background, prelinguistic communication skills, early vocabulary measures and family history of speech-language difficulties.

Linear regression models were fitted to receptive, expressive and core language scores on the CELFP-2. Logistic regression was used to examine the relationship between potential predictor variables and language impairment status at 4 years. Results from the regression analyses will be presented and predictors considered with respect to their contribution to language outcome at 4 years. Associations between predictor variables and causal pathways will be identified and examined. The potential for early risk factors to predict language impairment identified at 4 years of age will be discussed.

References:

Goldman, R. & Fristoe, M. (2000). *Goldman-Fristoe Test of Articulation* (2nd ed). Pearson Assessments.

Kaufman, A.& Kaufman, N. (2006). *Kaufman Brief Intelligence Test* 2nd Edition. Pearson Assessments.

Nelson, H.D., Nygren, P., Walker, M., & Panoscha, R. (2005) Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. *Pediatrics*, 117, 298-319.

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The other side of the coin - Predictors of precocious talking at 12 and 24 months and outcomes at 4 years

Jemma Skeat[1], Joanne Williams[1,2], Melissa Wake[1,2], Obioha Ukoumunne[3,1], Sheena Reilly[1,3], Margot Prior[3], Patricia Eadie[1], Lesley Bretherton[2,3], Edith Bavin[4]

[1]Murdoch Children's Research Institute, Australia, [2]Royal Children's Hospital, Melbourne, [3]University of Melbourne, [4]La Trobe University

Children who are ahead of their peers in expressive language development at an early age represent the other side of the coin in relation to both late talkers and children with language impairment. Examining these 'precocious talkers' may facilitate our understanding of the factors that support language development in young children.

Three main questions were examined relating to the precocious talkers (children with expressive vocabulary ≥ 90th centile) identified in the ELVS cohort:

1) do child, parent and family factors predict a precocious talking outcome in 1, 2 and 4 year old children;

2) to what extent is precocity in expressive language stable over different periods of time (e.g., 1-2 years, 1-4 years); and

3) do children who were precocious at early ages perform better than their peers on assessments of overall language ability and nonverbal intelligence at 4 years of age?

The first question was addressed using logistic regression to determine associations between potential predictive factors and a 'precocious talking' outcome (expressive vocabulary ≥ 90th centile) at 1, 2 and 4 years. The factors studied were gender, birth order, birth-weight, non-English speaking background, socio-economic status, maternal age, mental health, and vocabulary and educational attainment of parents. To answer question 2, we examined the number of children who were precocious on measures of expressive language (MacArthur-Bates Communicative Development Inventories; Fenson et al., 1994) between 1 and 2 years, 2 and 4 years, and 1 and 4 years. Finally, to answer question 3 we examined the 4 year language (Clinical Evaluation of Language Fundamentals – Preschool Australian Version; Wiig & Secord, 2006) and non verbal intelligence (Kaufman Brief Intelligence Test; Kaufman & Kaufman, 2005) scores of children who were precocious talkers at 2 years of age, compared to children who were not precocious at 2 years.

The developmental implications of being a child who is a precocious talker early in life, and the stability of precocity in expressive language will be examined and discussed. Overall, our findings support previous research on 'late talkers' (e.g., Reilly et al., in press) suggesting that children's vocabulary outcomes are not strongly affected by the psychosocial factors studied here, and that precocity is not stable for the majority of children in the early years.

References:

Fenson, L., Dale, P., Reznik, J.S, Thal, D., Bates, E., Hartnung, J.P et al. (1994). *MacArthur-Bates Communicative Development Inventories*. Baltimore: Paul H. Brooks.

Kaufman, A., Kaufman, N. (2006). *Kaufman Brief Intelligence Test* 2nd Edition. Pearson Assessments.

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Symposium Session 3 - Tuesday 29 July 11.00 - 13.00
Symposium Number – S3-2

Chair: Kamil Ud Deen, *University of Hawaii*
Discussant: Cécile De Cat, *University of Leeds*

The acquisition of Bantu verbal morphology: A comparative view

Description:

The comparative analysis of closely related languages (e.g., Romance, Bantu) is highly productive and informative, since it affords the opportunity to observe micro-variation in languages that otherwise does not arise. This approach has been profitably used in

investigating the acquisition of Romance and Germanic languages, and to a lesser degree, Korean and Japanese, but beyond these three groups, few (if any) language families have received any significant comparative scrutiny.

This symposium brings together eleven researchers working on the acquisition of four different Bantu languages (Sesotho, Setswana, Swahili and Xhosa). The symposium constitutes the first ever such presentation, as this is the first time a critical-mass of Bantu acquisitionists exist within the field. The symposium aims to provide the field with a unique perspective on the acquisition of those verbal elements thought to be fundamental to the acquisition of language (e.g., tense, agreement, mood, passives, and causatives), while at the same time providing detailed scrutiny of a highly circumscribed aspect of the Bantu languages: the verbal complex.

The Bantu verbal complex is agglutinative, and thus provides a relatively clear view of the morphology-syntax interface. Furthermore, across the Bantu family, the structure of the verbal complex is relatively stable, but varies in interesting ways. This raises questions on how these variations play out in the development of the verbal morphemes. For example, in Xhosa, tense may occur either preverbally or postverbally; in Sesotho tense is obligatory only when the verb is final within the verbal complex; and in Swahili, tense is obligatory in all contexts.

This symposium consists of five papers, each addressing partially overlapping aspects of the Bantu verbal complex. The first three presentations investigate the acquisition of subject agreement, tense and mood in three different languages (Sesotho, Xhosa and Swahili, respectively). While similar patterns of development are found (e.g., subject agreement is acquired before tense), each paper points to variation in the 'target' structure that may affect development (e.g., the tense differences mentioned above).

The final two papers investigate the acquisition of post-verbal suffixes (causatives, applicatives and passives). The first investigates a prediction made by Baker (1988): the development of object properties of causatives should be related to that of applied objects. A detailed statistical analysis of the speech of one Sesotho-speaking child reveals a real-time developmental relation, thus supporting Baker's prediction. The second paper investigates the acquisition of passives in Setswana-speaking children (with a special emphasis on passivized questions), with the aim of replicating results from other southern Bantu languages such as Sesotho and Zulu.

Finally, the discussant is an expert on the acquisition of Romance, and will provide an analysis of the Bantu findings relate to Romance and other European languages. For example, she will consider questions such as how and why the development of subject agreement in Romance differs from that in Bantu. This will ensure that the symposium serves a comparative function both within Bantu languages, but also across two genetically unrelated language families, and provides a mechanism for researchers to integrate findings from these disparate language families.

The acquisition of inflectional morphology in Sesotho

Katherine Demuth, Alissa Cerny, Dayna Alegria
Brown University

It has long been observed that children learning many languages exhibit the impoverished early use of verbal inflectional morphology. This has been of particular interest to theorists in terms of what it may say about children's early knowledge of syntax, as indicated especially by their use (or omission) of Tense and subject Agreement morphemes. Various theoretical approaches to this issue have been proposed, including both phonological proposals (e.g., the Metrical Omission Model), as well as syntactic proposals (e.g. the Truncation Hypothesis, Underspecification of AGR theory, and the AGR-Tense Omission Model (ATOM) (see Deen (2003) for review).

Bantu languages provide an interesting arena for exploring this issue since Subject AGR, Tense, and Object AGR are all realized as preverbal prefixes. This is illustrated with the typical template in (1) and an example from Sesotho in (2).

(1) Subject AGR – Tense – Verb Root - Mood
(2) Ke-tla-mat-a
SA-Fut-run-Indic
'I will run'

Like Xhosa, but unlike Nairobi Swahili, the present Tense morpheme in Sesotho only appears when the verb is final within the VP (compare (3) and (4)). Thus, only when the object is pronominalized as a preverbal object clitic, and no other argument follows the verb, does the present tense 'a' morpheme appear (4).

(3) Ke-rat-a koloi
SA-like-Indic 9car
'I like the car'
(4) Ke-a-e-rat-a
SA-Pres-OA-like-Indic
'I like it'

Research on the acquisition of Nairobi Swahili (Deen, 2003) indicates that Root Infinitives (bare verbs) hardly ever occur, and that Tense morphemes are rarely omitted in the later stages of development. In contrast, Subject AGR is frequently omitted. This is not predicted by any of the forgoing theoretical proposals. However, null Subject AGR is also licensed by the adult grammar, suggesting that this might affect children's omission of this morpheme.

Recent research on the Bantu language Xhosa (Gxilishe, de Villiers & de Villiers, 2007) has also found the gradual acquisition of Subject AGR. However, it is proposed that lexical subjects initially remain VP internal, and that Subject AGR only begins to appear once the subject raises to Spec-VP.

The purpose of the present study was therefore to explore the acquisition of Subject AGR and Tense in Sesotho in 3 children age 2;1-3;0 drawing on data from the Demuth Sesotho Corpus. The results differ from that reported for both Nairobi Swahili and Xhosa. At 2;1 there is pervasive use of 'filler' syllables, making it unclear if Subject AGR or Tense is being marked. Importantly, however, there are no Root infinitives and no VP internal subjects. By 2;6 marking of both morphemes is more consistent, but far from perfect. Only at 3 years do all children exhibit good morphological control of both Subject AGR and Tense. The theoretical implications of these findings for the previously proposed phonological and syntactic approaches to this problem are discussed.

First language acquisition of pre-verbal morphology in Xhosa

Sandile Gxilishe[1], Peter de Villiers[2], Jill de Villiers[1]
[1]University of Cape Town, [2]Smith College

Xhosa is a Bantu language spoken by approximately 8.2 million South Africans. Like other Bantu languages, the morphology is very rich. There are 15 noun classes that dictate the agreement marking that accumulates as preverbal morphology on the verb stem. Subject agreement is obligatory but object agreement is conditioned by such factors as tense and salience (Du Plessis, 1997; Gxilishe, de Villiers, & de Villiers, 2007). The verb stem has a number of positions for preverbal morphemes such as agreement, tense, and negation, as well as postverbal positions for tense, negation, derivational suffixes and mood, e.g.:

Umama uyamfundisa umntwana
"The mother teaches the child"

NClass-Subj	SubAgr.-Tense-	ObjAgr.	-Verb Root-	(Deriv. Suffs)-	Mood	NClass-Obj
U - mama	u - ya -	m -	fund -	is -	a	um - ntwana
The mother	present	him/her	learn	cause	indicative	child

Xhosa noun classes are not referentially transparent: the semantic categorization is neither systematic nor consistent. Thus the noun class markings resemble a set of fifteen grammatical gender classes. Xhosa has SVO word order but allows many variations of this order for stylistic purposes as well as emphasis. The subject noun can be dropped (pro-drop) leaving only the subject agreement on the verb appropriate to the class of the absent subject noun (Du Plessis, 1997).

We will present the findings of several studies of children's first language acquisition of the preverbal morphology of Xhosa – in particular of subject and object agreement, tense and negation. The data come from longitudinal language samples recorded every one to two months – for 5 children from 12-24 months and 5 other children from 24-48 months. 1155 utterances from the 1-year-olds and 2476 utterances from the 2- to 4-year-olds were analyzed. Several striking results will be compared with the predictions of generative linguistic accounts of the morphology of adult Xhosa and other Bantu languages (e.g., Buell, 2006; Du Plessis, 1997; Du Plessis & Visser, 1998) as well as with verb by verb or semantically-based accounts. For example, the acquisition of tense is best predicted by the generative rules proposed for the adult morphology rather than by simpler semantic considerations like transitivity. Acquisition of agreement marking and tense occurs across a large number of verb stems rather than lexical item-by-item, as has also been reported for Swahili (Deen, 2005). General processing demands measured by MLU in words or morphemes do not predict the presence or absence of agreement markers on the verb (see also Deen for Swahili). Similarly, subject agreement is not more or less likely to be provided if the noun is explicitly mentioned or not. Nor is it more or less likely to be provided if either a preverbal or post verbal tense marker is used on the verb. We argue that two to three-year-olds acquiring Xhosa as their first language are governed by the adult conditions on use of the morphology of the language. They do not appear to use simpler heuristics, but instead respect the more complex adult rules.

Raising the mood: Subject agreement in subjunctives in Nairobi Swahili

Kamil Deen
University of Hawaii

In this paper I show that subject agreement (SA) occurs at higher rates in subjunctive clauses (SUBJ, 61%) than indicative clauses (IND, 36%) in the speech of four Swahili speaking children aged 1;10-3;2. I argue this is because of the different structural configurations of SUBJ and IND: the former involves verb raising to a projection containing SA and mood features, while the latter involves no such verb raising. Thus in SUBJ, the verb and agreement features are in a local relation, allowing for local checking – a property that preferentially facilitates SA in SUBJ over IND.

Deen & Hyams (2005) argue that the functional syntax of Swahili involves a syncretic TP/MoodP. This is the equivalent of Chomsky's (2002) multiple-spec TP in which the lower spec involves tense features and the higher involves agreement features. The difference in Swahili is that the lower spec position is considered *syncretic* (Giorgi & Pianesi, 1997) or *bundled* (Bobaljik, 2006), in that either tense features or mood features are projected, but never both at the same time. I argue that when TP/MoodP projects as TP, default (unmarked) indicative mood arises, and the verb remains within vP. T features are checked through long-distance AGREE. However, when TP/MoodP projects as MoodP, the subjunctive mood arises, and is marked with the [e] final vowel. The verb raises to Mood to check mood features (long-distance AGREE is not available), as evidenced by the fact that subjunctive morphology occurs post-verbally. Thus the verb in the subjunctive raises to a position that is within the same functional projection as agreement features, allowing for local feature-checking. Thus the differential rate of SA in the two clause-types is neatly accounted for by the differential verb positions in the subjunctive and the indicative.

On the relationship between causatives and applicatives: Evidence from child Sesotho

Jean Crawford, William Snyder
University of Connecticut

Baker (1988) examined the morphological causatives and applicatives exemplified in Bantu languages, and proposed the following: if the causee in a causativized-transitive construction has direct-object properties, then the applied argument in an applicative construction will too. In Sesotho, for example, the causee of a causativized-transitive does have direct-object properties (e.g., can surface as an object marker). As expected, the applied argument (as well as the direct object) in an applicative construction also has direct-object properties.

Baker's generalization leads directly to an acquisitional prediction: if a child knows that Sesotho permits causatives (e.g., with intransitives), and is already producing applied arguments in applicative constructions, then she should also be able to form the Sesotho causativizedtransitive construction. To evaluate this prediction, we performed a detailed case study on Child H (2;1-3;0) from Demuth's (1989, 1992) longitudinal Sesotho corpora. Using COMBO, we extracted all verbal utterances whose morphological tier included a causative or applicative morpheme. Imitations and unclear utterances were excluded, as well as verb forms that were treated in (Demuth 1992) as lexicalized forms.

Our principal findings are as follows: Child H's first clear use of a causativized-intransitive occurred at 2;01, and he began to use applicative constructions at 2;02. Somewhat surprisingly, H's first clear use of a causativized-transitive did not occur until 2;04. A statistical analysis of the data, however, reveals that the gap between the applicative and the causativized-transitive, (comprising some 340 child utterances) is not significant. In a sample of ten later transcripts, H produced causativized transitives with a frequency of 2.86 per thousand utterances. The resulting binomial probability of the observed gap, if causativized-transitives were actually possible for H as early as applicatives, is (1-.00286)^340 = .376NS. Hence, our detailed case study, while not in it-self conclusive, lends acquisitional support to Baker's syntactic proposal.

The acquisition of the passive in Setswana-speaking children

Melissa Bortz, Maggie Tshule
[1]University of Stellenbosch, [2]University of Witwatersrand

Acquisition of the passive occurs earlier in Bantu languages than in English. The passive has been found to be used productively by age 2;8 in Sesotho and Zulu (Demuth,1987, 1989, 1990b, 1992: Suzan; 1987, 1990) while it is only fully acquired in English in middle to late childhood (Horgan, 1978). Thus, crosslinguistic research indicates a disparity in age of acquisition of the passive. Setswana is the fourth most commonly spoken language in South Africa, yet no acquisition studies have been performed in this language.

The aim of this study is to investigate the acquisition of the passive in 15 children. Children are divided into three groups aged 2.6 – 3.5 years, 3.6 – 4.5 years and 4.6 – 5.5 years. The passives that are tested include actional and non-actional passives, as well as verbal and adjectival passives, yielding a total of four conditions. (+/- actional, verbal/adjectival). In addition to Spontaneous speech samples from each subject, elicited production tasks (Thornton, 1996) are used to assess children's' expressive knowledge of the passive and act-out tasks (Goodluck, 1996) are used to evaluate the subjects' comprehension of the passive. Responses are analyzed using descriptive statistics and ANOVAS. An example of an elicited production test item is the tester acting out a sheep being stepped on by a goat. She asks the subject `What happened to the sheep?' The expected response would be `the sheep is stepped on by the goat'

Another aspect of passives that is examined is full and truncated passives. Full passives are devised using both 'regular/positive' and negatively affected patients or adversity passives. Demuth & Kline (2006) recently provided useful information on prevalence of passives used as questions by Sesotho-speaking parents. Passive questions are used frequently in Bantu languages because these languages do not allow wh-questions in subject position. Thus "topical information is mapped into subject position and new information into object position" (Demuth & Kline, 2006, p. 379), this new information exists in the by-phrase. A unique feature of this study will examine children's abilities to use these passive forms of questions.

This study will contribute language acquisition data on a relatively under-studied language for a structure that has garnered great attention over the last several decades. Importantly, it will provide further evidence of the developmental time course for the acquisition of the passive in a third Bantu language (Setswana), thus bolstering the claims of Demuth (1989), who argues that the passive is acquired before the age of 3yrs by children speaking some Bantu languages.

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00
Symposium Number – S3-3

Chair: Akira Takada, *Kyoto University*
Discussant: Akira Takada, *Kyoto University*

Pragmatic constraints and resource diversity in caregiver-infant interactions across cultures

Description:
Research efforts are shedding new light on the diversity of cultural resources that caregivers use while engaging in child rearing. For example, we have learned about the variability of the linguistic features of child-directed speech (Ochs, 1988; Fernald et al., 1989; Brown, 1998, 2002), parental ideologies (Konner, 1976; Bril et al., 1989; Takada, 2005) and the environmental setting for child care (Whiting & Whiting, 1975) across cultures. Conversely, less emphasis has been placed on how caregivers and children face largely common pragmatic constraints when they are involved in face-to-face communication in a variety of cultures? Most caregivers make an effort to sooth a fretful infant and attract the child's attention, and they gradually expand the range of responses in terms of time and space as the child grows. The pragmatic constraints provide the foundations for achieving mutual understanding in the course of interaction. Language is used to enormously amplify the potential of mutual understanding (Levinson, 2006).

This symposium discusses how caregivers and prelinguistic children collaborate to accomplish interactional "tasks" that are common requisites of face-to-face communication, while using divergent communicative resources across different cultures. We are interested in documenting the range of caregiver strategies used in different cultural contexts, and the range of variation that exists in how infants are drawn into social interaction before they produce their first words. The critical age is between about 9 and 18 months, when a child first comes to understand another's intentions, and subsequently, major social–cognitive abilities emerge (Tomasello, 1999).

At this age, Western infants progress from sharing attention (alternating gaze between an object and an adult's face) to following the adult's attention (looking at what the caregiver is looking at) to directing the attention of others (Carpenter et al., 1998). At around 12 months of age, an important developmental milestone occurs: babies look reliably where adults are looking, and using adults as social reference points, babies gaze at adults to check what to do in an uncertain situation. Moreover, babies act on objects in the same manner as adults, and they actively direct adult attention. All of these are putatively essential prerequisites for coordinated interaction, and subsequently for learning language. Yet, we have very little information about whether or to what extent these practices vary across cultures.

Each of the papers in this symposium examines a particular aspect of caregiver–infant interactions, for example, behaviours like turn-taking, pointing, referential alignment, joint attention over a third object or event and imitation, asking how these are shaped culturally by parental ideologies and practices. The speech communities investigated in these papers include the Tzotzil Maya society in Mexico, Rossel islanders in Papua New Guinea, the Kiranti Rai community in eastern Nepal, Germans and Japanese. The symposium deepens our understanding of the role of culture in children's social–cognitive development and the process by which infants come to be members of their speech community.

The integration of gaze and pointing in infant/caregiver interaction in two cultures

Penelope Brown
Max Planck Institute for Psycholinguistics

Are milestones of child development for interaction affected by cultural differences in interactional style with infants? Two presumptions in the literature suggest that different child-rearing practices might be expected to have such effects. These are (i) that the child's entry into social understanding is grounded in communication with others, and (ii) that the extent and nature of social interaction a child experiences will influence the development of their social understanding. A critical period for looking for such influences is around the end of the first year, when children begin to engage in episodes of joint attention with caregivers over a third object or event (the 'referential triangle', Tomasello 1999).This paper examines videotaped interactions between caregivers and 9-15-month-old infants in two societies, looking for evidence of the children's developing competence in engaging in joint attention episodes. One is a Mayan society in Mexico, where interaction with infants during their first year is relatively minimal; the other is on Rossel Island (Papua New Guinea), where intensive face-to-face communicative behaviors characterize interaction with infants from shortly after the child's birth. I examine interactions in both societies for episodes of gaze following, index finger point following and production, and the integration of gaze and vocalization with pointing. The purpose is to induce from these interactions when and how the infants come to have 'a representational understanding of the behavior of others', and to see whether there is any evidence that differential practices have differential consequences in the children's development of communicative understanding.

Comparing young children's communicative environments in two cultures

Sabine Stoll[1], Elena Lieven[1,2]
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The literature suggests that children raised in some cultures other than those of urban, technological societies receive a different language input, for instance they are spoken to less and spend more time with other children than with adults (see Lieven 1994 for an overview). There are obvious implications for theories of language development that depend on frequent and close dyadic interaction for children's early communicative and subsequent language development. However, almost all studies have been qualitative rather than attempting to get quantitative measures of childrens differing language environments.

In the present study, we compare the communicative and language development of 6 children growing up in a Kiranti Rai community of Eastern Nepal and learning Chintang, a Sino-Tibetan language, with that of six age- and gender-matched children growing up in a village in Germany. Videotapes of periods during the children's day were coded for the following: the amount of talk to the child; the number of different people interacting with the child; imitations of, and by the child as well as pointing, offers and other interactive activities. The results suggest, at least for these two cultures, that a much more nuanced view of children's communicative environments is necessary and that we need to think rather carefully about how we characterise the communicative environments of children in the more familiar cultures of urban technological societies as well as those of other cultures.

Socio-cultural and cognitive factors in the emergence of pointing

Ulf Liszkowski
Max Planck Institute for Psycholinguistics

Before communicating linguistically, infants communicate gesturally, in particular by pointing. Recent research has demonstrated that infants' prelinguistic pointing at 12 months, when it has just emerged, is already a fully communicative, cooperative act (Tomasello, Carpenter, & Liszkowski, 2007). Research has emphasized the role pointing plays in language acquisition, but extremely little is known about how pointing it-self emerges, and whether it does in the same way across different cultures. Whereas some researchers hypothesize a more individualistic route (e.g., through ritualized reaching or self-orienting), others emphasize its social origins (e.g., imitation and/or joint interaction). On a social account, one could imagine that the amount of modelled pointing, infants' comprehension of adults' pointing, and infants' imitation skills would relate to the emergence of pointing. In addition, cultural variation in caretaker-infant interactions could affect the emergence of pointing. The current paper spells out different emergence accounts and their predictions and presents new empirical studies based on correlational and cross-cultural approaches.

In one study German 12-month-olds (n=39; approximately half of whom already pointed and half of whom did not) were recruited and tested on several tasks. In the 'decorated room' -task, mothers and infants were brought into a room decorated with posters and toys. Mothers were instructed to 'have a look around together' with their children (5 minutes), with no mention of pointing or the purpose of the study. Spontaneous pointing by mothers and infants was recorded. Next, infants were tested on a standard object permanence task; on several point comprehension tasks (point-following to lateral targets, behind barriers, and occluded referents); and on several imitation tasks (goal-directed imitation, role reversal, and gesture mimicry). In addition, a free play situation between mother and infants with toys (5 minutes) was recorded.

It was found that mothers of pointers tended to point more than mothers of non-pointers, and pointers were overall better than non-pointers on the point comprehension tasks, but not on the imitation or object-permanence tasks. The overall pattern of results suggests that point comprehension and amount of maternal pointing influence point emergence, while simple gesture mimicry and general cognitive capacity (as measured here by object permanence) do not.

A further series of studies (completed and ongoing) have been conducted to administer the'decorated room' -task in different cultural settings in India and Mexico, in order to document and analyze caretaker-infant pointing. First results show that the same basic task elicited mothers'and infants'pointing in various settings despite cultural differences, with infants'age of pointing being roughly the same. Methodological and theoretical implications of these results are discussed with regard to the cultural study of the emergence of pointing in infancy.

The developmental trajectory of give-and-take activity in caregiver-infant interactions

Akira Takada
Kyoto University

Research on the development of social interaction has shown how caregivers and infants, from the moment of birth, reciprocally accommodate their patterns of behaviours (Kaye, 1982; Fogel, 2006). The interaction patterns are gradually shaped by the collaboration between caregivers and infants, with reference to the cultural norms of a given speech community (Ochs, 1988; Takada, 2005). What is emphasized less often, however, is that the interactants do not always take actions in accordance with cultural norms. The reactions to such "infelicitous" actions are important, particularly when discussing the practices of early cultural learning. Using videotaped interactions involving 9- to 15-month-old Japanese infants, who were selected from over 600 "baby researchers" registered in our child development research group, I investigated the development of communicative competence in caregiver-infant interactions, focusing on the interactions that occurred while infants were engaged in giving and taking things with another (give-and-take activity). The data showed that even young infants sometimes produced an action that achieved effective coordination of the interaction in situations where the caregiver had provided the infant with a framework of activity. This does not necessarily mean that infants can apply such an action straightforwardly in other situations. As the variety of psychological and behavioral operations increased, one of the infants became increasingly active in giving things to or taking things from another. However, the same infant often showed some difficulty receiving things from another, and the pattern of the interaction became rather disarrayed. In a later period, when the infant had learned how to read the intentions of others, the interaction pattern regained its orderliness. Thus, what Fogel (2006) calls a "bridging frame", which links historically formed frames of interactions to the emergence of a new frame that is contingent on the context of face-to-face interactions, occurs in interactions arising from give-and-take activity. The analysis suggests that infants at this age gradually begin to comprehend themselves through their reflection in others. Consequently, it would seem that infants can foresee and organize the framework of their activity, a framework that is formed socio-culturally.

Socializing attention to third referents: A look at Tzotzil (Mayan) caregiver-infant interactions in natural and created environments

Lourdes de León, Margarita Pérez
CIESAS

Literature about infant communicative development talks about the "nine-month revolution," a period when infants actively coordinate their interlocutor's visual attention to a third referent. This connection between speaker, addressee and referent has been referred to as the "referential triangle" (Tomasello, 1999). In this paper, we examine interactions between caregivers and young infants with ages

between 8 to 15 months old in two Tzotzil (Mayan) communities of Chiapas, Mexico (Zinacantán and Huixtan). We focus on processes of "referential alignment" which involve coordination of interlocutor's visual attention towards a third object or event.

We examine two kinds of caregiver-infant interaction data in two different contexts: (i) the natural everyday home environment and (ii) a "created" environment with specific stimuli (a "decorated room") (see Ulf Liszkowski in this symposium). In this task, mothers and infants were brought into a room decorated with posters and toys. Mothers were instructed to 'have a look around together' with their children (5 minutes), with no mention of pointing or the purpose of the study. Spontaneous pointing by mothers and infants was recorded.

We first analyze the natural environment data in terms of: (i) the relative frequency of "referential alignment" activities in relation to other interactional routines occurring between caregivers and infants, (ii) the nature of caregiver-children´s joint attention to third referents (e.g. face-to-face interaction vs. parallel aligned interaction, use or absence of demonstrative pronouns accompanied or not by a pointing gesture). The created environment data is then checked against natural environment data in terms of the nature of the "referential alignment" process: coordination of interlocutor´s visual attention, activities of demonstration involving demonstrative pronouns, accompanied or not by pointing gestures.

The "natural environment" data come four children between 7-15 months old with a total of 30 hours of videotaped interaction, and a large corpus of ethnographic data. The "created environment" pilot data come from three caregiver-infant dyads with children from 12 to 15 months old in the village of Huixtan, Chiapas.

The study aims to tease apart the cultural context of "referential alignment" events in connection to the management of attention in early children socialization.

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00
Symposium Number – S3-4

Chair: Mitsuhiko Ota, *University of Edinburgh*
Discussant: Mitsuhiko Ota, *University of Edinburgh*

Early representations of prosodic information

Description:
Research on the acquisition of prosodic properties such as stress, tone and pitch accent has shown that infants' ability to process prosodically relevant phonetic information develops rapidly in the first year. For instance, it has been demonstrated that 0- to 2-month-olds can discriminate prosodic differences in linguistic stimuli (Nazzi, Floccia & Bertoncini, 1998; Jusczyk & Thompson, 1978). Between 6 to 9 months of age, this sensitivity declines for suprasegmental differences that are not lexically employed in the ambient language (Mattock & Burnham, 2006), while at the same time it becomes more attuned to the predominant prosodic patterns evident in the native language (Jusczyk, Cutler & Redanz, 1993; Jusczyk, Houston, & Newsome, 1999). Recent studies also show that infants on the cusp of word learning store some prosodic information of the individual lexical items in the language (Vihman, Nakai, DePaolis, & Hallé, 2004; Curtin, Mintz, & Christiansen, 2005). However, our understanding of the developmental process towards adultlike prosodic representation still leaves many questions unanswered. Specifically:

1. How does exposure to a particular language shape infants' perceptual sensitivity and bias with respect to prosodic information?
2. When exactly do infants begin to encode and access prosodic information in their representations of lexical items? To what extent is this dependent on the relative functional load of prosodic information in the language?
3. How independent is prosodic information in early representations? How does it interact with segmental information?
4. What types of prosodic information do infants encode in their lexical representations? Does it contain only lexically critical information or also information whose source is outside the lexical item?

These are the central questions addressed in this symposium. We have adopted a crosslinguistic perspective, and assembled four papers that cover a range of typologically different prosodic systems in development: lexical tone, stress (with trochaic vs. iambic pattern), and lexical pitch accent.

Paper 1 shows that the perceptual reorganization of tone by learners of non-tone languages occurs independently of the perceptual reorganization of vowels, but the rhythmic properties of non-tone languages do not influence tonal perception. In contrast, Paper 2 presents evidence that the prosodic/rhythmic characteristics of the ambient language result in a bias in stress processing. Furthermore, the study examines how such prosodic differences may affect the prosodic processing of bilingual infants exposed to contrasting systems such as German and French. Processing biases emerging from the predominant native prosodic pattern are also investigated in Paper 3, which furnishes evidence that English infants use a stress-initial syllable strategy to parse words. The paper then examines the extent to which English infants store and access stress information in learned words. Finally, Paper 4 focuses on the nature of early prosodic representations in Japanese, in which pitch contours of words reflect both lexical and phrasal information. The paper examines whether the distinction between the two information types is taken into account in infants' lexical representations.

A general discussion will follow the presentations of these papers to consolidate the findings and discuss their implications for the questions stated above.

Segmental suprasegment or suprasegmental segment? Tone and its representation in infancy

Karen Mattock
Lancaster University

Lexical tone is present in over half of the world's languages and is characterized by variations in fundamental frequency (F0), perceived by the listener as pitch. Tone's status in linguistic systems is disputed – it is segmental/phonetic in function and suprasegmental/prosodic by nature. Like consonants and vowels it distinguishes word meaning; like intonation it has F0 as its primary acoustic correlate, it extends beyond a single unit of speech, and similar to lexical stress it is correlated with the expression of the vowel. Tone's place in phonological theory is also debated. Chomsky and Halle (1968) considered tone a feature of the vowel, but in autosegmental phonology (Goldsmith, 1976, 1990) tone is classed as an independent phonological element with independent phonological representation. These issues have implications for infant speech perception and the development of phonetic representations of tone, and will be discussed with reference to what is known about infants' tone perception.

Infants' phonetic (consonants, vowels) and suprasegmental (prosody, stress patterns) representation develops through a process of perceptual reorganization. Initial sensitivity to the 'universal' set of phonetic contrasts and prosodic patterns is refined with increasing language experience so that infants become less sensitive to nonnative features and more sensitive to native language features. This attunement occurs between approximately 6 and 9 months for suprasegmental features, 4 and 6 months for vowels, and 8 and 12 months for consonants. Recently, Mattock & Burnham (2006) found perceptual reorganization of tone in the form of maintained discrimination of tone contrasts between 6 and 9 months of age for Chinese (tone language) infants, and significant decline in

discrimination with age for English (non-tone language) infants. This study demonstrated that for infants learning a tone language, phonetic representations for tone are established from early infancy and maintained during the first year of life based on linguistic experience. It also raised a number of questions about non-tone language infants' perception: i) was tone perceived as intonation, akin to prosodic features? ii) given articulatory and structural correlations between tones and vowels, is tone reorganized earlier in development in concert with vowels? and iii) does suprasegmental language environment impact nonnative tone perception ?

Mattock et al. (in press) addressed these questions by investigating tone discrimination by 4, 6, and 9-month-old infants recruited from different suprasegmental language environments – stress-timed English and syllable-timed French. The timing of perceptual reorganization for tone was found between 6 and 9 months for both English and French infants, and not from 4 months as for vowels. These findings suggest that tones and vowels are not perceived in the same way, that they are processed independently, and that phonetic representations of tones and vowels emerge at different points in development. They also indicate that suprasegmental language environment has no influence on nonnative tone perception. The implication of these findings for the classification of tone and vowel as independent, and in turn, for the development of lexical representations of tone for infants learning a tone language, will be considered.

Monolingual and bilingual German/French learning infants' sensitivity to lexical stress

Barbara Hoehle[1], Ranka Bijeljac-Babic[2], Josette Serres[2], Birgit Herold[1], Thierry Nazzi[2]
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Infants are sensitive to prosodic information from birth, just as they are sensitive to phonetic contrasts. Young infants distinguish words that vary on a number of prosodic dimensions, even on dimensions not used in their native language, as shown by French newborns' discrimination of Japanese words contrasted on pitch contour (Nazzi, Floccia & Bertoncini, 1998). Infants can also discriminate from birth sentences from different languages by relying on prosodic/rhythmic information (Nazzi, Bertoncini & Mehler, 1998; Ramus, 2002).

Some studies have also started looking at the changes in prosodic perception over development. On the one hand, just like infants specialize into native language phonetic processing, a few studies have investigated infants' acquisition of the prosodic properties of their native language, focusing in particular on the perception of stress patterns. For example, English-learning infants start preferring trochaic over iambic words between 6 and 9 months of age (Jusczyk, Cutler & Redanz, 1993). On the other hand, one study suggests that as for phonetic development, the acquisition of native language prosodic properties is accompanied by a decrease in sensitivity to non-native prosodic properties. This is attested by the fact that English-learning (but not Chinese-learning) infants' sensitivity to tone contrasts declines between 6 and 9 months of age (Mattock & Burnham, 2006). How these developments would affect infants acquiring two languages with different prosodic properties has never been addressed so far, and is the focus of the present study. As has been found for bilingual phonetic development, the acquisition trajectory might not resemble that of monolingual infants (Bosch & Sebastian 2003).

In the present paper, we report data from a study of monolingual and bilingual German- and French-learning infants' perception of lexical stress. While German is a stress-based language with a dominance of trochaic units, French is considered as a syllable-based language without stress at the lexical level although the final syllable of a bisyllabic word is lengthened when the word appears in phrase final position. Using the headturn preference paradigm, infants were presented with sequences of trochaic and iambic bisyllables. The results first show that monolingual German infants develop a trochaic bias between 4 and 6 months of age, while monolingual French infants do not prefer either pattern at 6 months even though they can discriminate the stress pattern. Second, we will report ongoing research investigating how bilingual German/French infants perceive trochaic and iambic stress patterns. In the ongoing experiment, the 6-month-old bilingual infants (half of which are tested in Germany, while the other half are tested in France) are presented with the same trochaic and iambic stimuli as the monolingual infants to determine the extent to which the development of a trochaic bias is affected by the simultaneous exposure to two languages that are as different with respect to their rhythmic/prosodic properties as German and French.

Stress is encoded in early lexical representations

Suzanne Curtin
University of Calgary

Over the past couple of decades, researchers have established that infants are sensitive to the predominant stress pattern of their native language. This sensitivity is evident in infants as young as 1-month of age (Jusczyk & Thompson, 1978) and by nine-months English infants demonstrate a preference for the predominant stress pattern consisting of strong-weak syllable patterns (Echols, Crowhurst & Childers, 1997; Jusczyk, Cutler, Redanz, 1993). Sensitivity to the predominant stress pattern is helpful in a number of language learning tasks. Indeed, when infants first start segmenting words at seven and a half months, their language-specific rhythmic biases guide segmentation (Jusczyk, Houston, & Newsome, 1999; Polka, Sundara, & Blue, 2002).

Given infants' sensitivity to stress, we explored whether stress is merely a cue to help parse speech or whether it is also an important part of the representation of newly learned sequences. A series of experiments tested 9- and 7-month-old infants on their ability to use lexical stress to parse sequences from an artificial language. Our results support a stress-initial syllable strategy (Cutler & Norris, 1988) and demonstrate that infants encode stress information as part of their proto-lexical representations (Curtin, Mintz, & Christiansen, 2005). We are currently testing whether stress alone, in the absence of co-occurring distributional information, is used for segmentation. Our findings (N=32) demonstrate that English infants are aligning stress with word beginnings.

We further asked whether or not infants attend to and access stress information in the early stages of word learning. We habituated 12-month-olds to two new novel word-object associations using the Switch procedure (Werker et al., 1998). After habituation, we tested whether infants of this age notice a switch in a word-object association if the segmental information remains constant but the stress pattern is altered. We also examined whether at this age infants are only paying attention to the stress pattern and ignoring segmental information. Our findings reveal that infants as young as 12-months can learn two new word-object pairings. However, this pattern of results depends on the difficulty of the task and the infant's age. These findings suggest that cognitive demands and the saliency of the input – in this case the different stress patterns – are crucial factors in younger infants' ability to learn novel word-object associations. We are currently testing whether infants of this age are only attending to the stressed syllable. We are teaching infants novel three syllable words and then shifting the position of the stressed syllable in the word at test. The results of this study will help to elucidate the structure of the infant's representation and whether or not syllables are required to occur in fixed positions.

In summary, these experiments suggest that infants use stress to posit initial word boundaries and they encode the stress pattern in their representations of potential words. Thus, infants are building detailed representations of 'potential' words that include the stress pattern of the word, and infants make use of this information in early word learning tasks.

Lexical and phrasal pitch contours in early lexical representations

Mitsuhiko Ota[1], Naoto Yamane[2,3], Reiko Mazuka[2,4]
[1]University of Edinburgh, [2]RIKEN Brain Science Institute, Japan, [3]Tokyo Gakugei University, [4]Duke University

Infants display sensitivity to the global prosodic pattern of their native language from birth (Nazzi, Bertoncini & Mehler, 1998; Ramus, 2002), and begin to show preference for the predominant prosodic shapes of native words by nine month (Jusczyk, Cutler, Redanz, 1993). However, when and how these sensitivities are employed to encode specific prosodic information of individual lexical items is still poorly understood. A challenge the learner faces in this process is to tease apart the patterns that inherently belong to the lexical item (and therefore need to be part of the representation) from those that are due to non-lexical sources.

In this paper, we address this issue by examining how children learn and identify novel Japanese words with different pitch contours. Pitch contours of Tokyo Japanese words are largely determined by two factors: a lexically-assigned pitch fall (pitch accent) and a phrase-initial pitch rise. The interaction of the two gives rise to a variable contrast in minimal pairs such as /'ame/ ('rain') and /ame/ ('candy'). In phrase-initial position (including citation form), the initially-accented /'ame/ exhibits a characteristic pitch downfall toward the second syllable, while the unaccented /ame/ shows a pitch rise. However, in phrase-medial position, /ame/ becomes flat in pitch whereas /'ame/ retains the falling contour. Can Japanese-speaking infants learn novel words that differ by this contrast? And if so, are their lexical representations robust enough to cope with the variable pitch patterns exhibited by unaccented words? In other words, can they construct lexical representations of pitch contours that abstract away from non-lexical factors?

In our first experiment, we used the Switch task to habituate sixteen 17-month-olds to two pairs of word-object associations. The two words, played in isolation, were both disyllabic and segmentally identical (/mana/) but differed in their overall pitch contour (i.e., falling vs. rising). The infants showed longer looking times towards the visual stimulus when the object-word pairing was switched in the testing phase. Thus by 17 months, infants exposed to Tokyo Japanese are capable of mapping falling vs. rising contours onto different referents.

In a second experiment, we are using a visual fixation paradigm to test whether 17-month-olds can learn new word-object associations and recognize the mapping even when the contour patterns change due to phrasing differences. Infants (N=32) are trained with word-object pairings that feature an initially-accented /'mana/ and an unaccented /mana/ in citation form. In the test phase, the infants are presented with both objects shown on separate monitors and the accented or unaccented /mana/ played in a phrase-initial or phrase-medial position of the carrier sentence. If 17-month-olds are able to encode only the lexically relevant difference between the accented vs. unaccented words, they should show longer looking times towards the target object regardless of the contour variability across different phrase contexts. Results of these experiments and their implications for the nature of lexical prosodic representations in infancy will be discussed.

Symposium Session 3 - Tuesday 29 July 11.00 - 13.00
Symposium Number – S3-5

Chair: Wolfgang Dressler, *Austrian Academy of Sciences*
Discussant: Wolfgang Dressler, *Austrian Academy of Sciences*

Why are noun plurals hard to acquire? A multi-task approach

Description:
Noun plurals are an inflectional category which emerges early on, usually in the later part of the second year of life, in many languages -- given the primacy of the number category and the obligatoriness and general applicability of inflection. At the same time, gaining command of the full range of morpho-phonological properties of plural systems is a protracted developmental process that may take up to puberty if not later. In that respect, noun plurals provide a window on the emergence and consolidation of grammar. The aim of the current project is to examine the role of morphological complexity in learning to pluralize nouns across childhood in four languages – Danish, Dutch, (Austrian) German and Hebrew. The three Germanic languages under investigation vary along the clines of morphological richness and phonological transparency, and thus present hitherto unexplored challenges to children learning them. Hebrew, a Semitic language with a more complex plural system, offers yet another perspective on the interaction of gender and phonology in pluralizing nouns.

In order to permit a strict and systematic comparison of the developmental paths in acquiring the four systems under consideration, we have constructed a novel framework delineated in paper I (methodology), which highlights their similarities and differences.

The symposium is constructed as follows: After an introduction detailing the rationale and methodology of the project, we present four papers, as follows: (1) The Classical Task: An experimental cross-sectional study of plural production in children 3-10 in Danish, Dutch, (Austrian) German, and Hebrew; (2) The Lotto Game: a less rigid experimental task in a play context testing plural formation in children aged 5-10 in Dutch, German, and Hebrew; (3) Semi-structured and free elicitation of noun plurals in two cross-sectional naturalistic contexts from children aged 5-10 in Danish, German, and Hebrew; and (4) Analyses of noun plurals in longitudinal child speech and child directed speech of children aged 1;6-6 in the four languages. We conclude with a brief summary of findings and their implications for the acquisition of child morphology.

Methodology: Stem and suffix structure

Dorit Ravid
Tel Aviv University

In most languages, plural formation consists of two operations – plural affixation (e.g., *girl / girls*) and stem change (e.g., *foot / feet*), or their combination (e.g., *child / children*). Our model is thus constructed along two axes – one, plural suffix predictability and two, stem transparency. Suffix predictability is computed according to two criteria – degree of sonority of the stem-final phonological segment, and inherent noun gender; stem transparency refers to the set of possible phonological changes in the singular stem under plural formation. In order to reduce granularity and enhance the psychological reality of this model, we transformed two continuous into categorical variables, limiting the number of categories along each axis to three: Fully predictable, partially predictable and exceptional plural suffix choice; non-changing, slightly changing, and substantially changing stems. The full range of degrees of suffix predictability and stem change thus results in a 3 x 3 matrix which configures plural formation. Although particular languages, and especially child-directed or child-produced speech, may not fill all nine cells, this matrix logically defines the potential of a plural system. Moreover, it is applicable both to other languages and to other domains of morphology.

The complexity of the plural space as captured in our model motivates our choice of a multi-task approach to tracing the developmental paths of children learning the four systems under consideration. To explore this space to its fullest across acquisition, we conducted five different studies on both naturalistic and experimental data, encompassing both longitudinal and cross-sectional

methods. As we show in the individual paper presentations, not only is our model validated as a psychologically real construct across the four languages, it also predicts the course of development and the sites of difficulty in learning to pluralize nouns.

The classical task: From singular to plural form in Dutch, Danish, Austrian German, and Hebrew

Steven Gillis[1], Agnita Souman[1], Inge Molemans[1], Sim Dhollander[1], Katja Rehfeldt[2], Laila Kjaerbaek Hansen[2], Hans Basboell[2], Sabine Laaha[3], Johannes Bertl[3], Wolfgang Dressler[3], Naama Lavie[4], Ronit Levie[4], Dorit Ravid[4]
[1]Antwerp University, [2]University of Southern Denmark, [3]Austrian Academy of Sciences, [4]Tel Aviv University

Aims and background: The aim of the 'Classical Experiment' was to test children's knowledge of plural formation using a set of existing words, unlike a WUG test. Hence we will get a diagnostic view of their suffix selection as well as their knowledge of stem changes. In addition, the results of the experiment will give a picture of how children's knowledge develops over time and how well the dimensions 'suffix predictability' and 'stem transparency' are able to account for children's behavior.

Method

Subjects: For each of the four languages, 20 subjects were tested in 7 age groups, ranging from 3-year-olds to 9-year-olds. The experiment was also administered with a control group of adults.

Procedure: The procedure consists of a classical set-up in which the subjects are shown pictures of objects. On presenting each object, the test leader says: "Here is an X (name of the object)". The next picture shows two (or more) instances of X and the test leader says: "Here are two/a lot of ...." and the child is expected to provide the plural form of X.

Stimuli: The target words used in the experiment were easily picturable and judged to be known even by the youngest participants. Moreover, all the test words were found in child addressed speech, see the longitudinal data.

Predictions: Given that the model underlying the design of the experiment was identical for each language, we predicted that the outcome would be identical for each language. More specifically, the following predictions were articulated:

Prediction 1: a global analysis of the plural forms provided by the subjects is expected to show an increase of the correct responses as children grow older.

Prediction 2: As to suffix selection, we expect that the plural of nouns selecting a fully predictable suffix will be more readily mastered than the plural of nouns with a partially predictable suffix, and plurals that are exceptional as to their suffix selection will be most difficult and, hence mastered later.

Prediction 3: As to stem change, we expect that plurals with no stem change involved will be 'easier' in each age group, and hence also earlier acquired than plurals with a slight stem change, which in turn will be 'easier' than plurals involving a substantial change.

Taken together, these predictions amount to the following: given the matrix described in the "Methodology", stimuli in the upper left corner will, in general, be 'easier' (more correct scores) and will be earlier acquired. Stimuli in the right cell at the bottom will be the hardest in each age group, and will be acquired later than the stimuli in any other cell.

Results: On the whole the results are in agreement with the predictions, in that for each language the topology of the matrix accounts for (1) the relative amount of correct plurals in each age group; and (2) the relative order of acquisition when the data are analyzed longitudinally.

The lotto game: A cross-sectional experimental task in a play context testing plural formation in Austrian German, Dutch, and Hebrew

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Aims and background. Children's performance and the amount of knowledge that they demonstrate in a linguistic domain such as noun plurals is subject to changes in the context in which it is elicited. Classical structured experimental elicitation (as presented in the previous paper) is sure to focus on the desired linguistic phenomena, but may fail to truly reflect children's ability at a given time, due to the pressure and artefact of school-type testing. The aim of this study is to test children's knowledge of plural formation in Austrian German, Dutch, and Hebrew by using a less rigid experimental task in a play context (Lotto game) and to compare it with results obtained in a classical experimental design.

Predictions. As in the previous paper, we predicted 1. that plural words with non-changing stems should show a higher percentage of success than those with slightly and substantially changing stems; 2. that plural words with fully predictable suffixes should show a higher percentage of success than those with partially predictable and lexical exception suffixes. Specifically for this study we predicted that, due to the less "overt" testing procedure used, the percentage of success should be higher in the lotto game than in a classical experimental design.

Methodology.

Participants: In each language, 100 children were tested in five age groups, ranging from 5- to 9-year olds (20 children in each group).

Procedure: The Lotto game is a playful naming task in which the child to be tested is asked to instruct another child to complete a coloured board with picture cards depicting plural objects (e.g. *CHI: Put the tigers on the blue square!). This provided us with a structured way to assess the instructing child's knowledge of noun plurals without the pressure of an overt testing procedure.

Materials: The stimulus items were easily picturable, and were shown to occur in CDS addressed to young children. In each language, they were classified according to the 3 x 3 matrix (stem transparency, suffix predictability), see the "Methodology".

Comparison with a classical experimental design (Austrian German only): In order to allow a detailed comparison with children's performance in a classical experimental design, the same stimulus items were also presented in form of a classical experiment (e.g. *INV: This is a tiger. And what are these? These are three/many __), to the same children, after a time interval of 2 weeks.

Results. First results indicate that from age 5 onwards, stem transparency is no longer an important factor for German, but remains important for Hebrew, where differences in transparency are much more substantial than in the Germanic languages. As to suffix predictability, first results confirm our prediction. Our last prediction was also confirmed, as Austrian children produced significantly more correct responses in the lotto game than in the classical experimental design. Furthermore, we found that the percentage of success with lexical exception suffixes is higher in the lotto game.This indicates that the lotto game – as opposed to a classical experimental design – highlights morpho-lexical knowledge of the plural words.

Cross-sectional naturalistic elicitations: Scripts and conversations in Hebrew, Austrian German, and Danish

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Aims and background. The two elicitation measures presented here – Script elicitation and analysis of conversations aim to investigate patterns of distribution and acquisition of noun plurals occurring in the actual speech of preschool and gradeschool children in more

natural contexts than experimental contexts. These are investigated cross-sectionally in three languages: Austrian German, Danish, and Hebrew.

Predictions. Based on our published work on CDS addressed to young children (Ravid et al., in press), we predicted few noun plurals in early free play. We expected the Scripts study to yield more plural forms, due to its design which focused on plural entities. We also expected most plurals to have regular suffixes and non-changing stems in the speech of our younger age groups, with increased and more diversified plural forms with age, across the three languages.

Methodology. In both studies, only monolingual children from middle-high SES, with no developmental or linguistic disabilities were recorded.

Scripts: In each language, 80 children were tested in four age groups: 3-year-olds, 5-year-olds, 7-year-olds, and 9-year-olds, with (usually) boys and girls equally represented in each group. Each participant was shown five pictures of Bobo the bear in different contexts - the zoo, birthday party, supermarket and beach, which we thought were good triggers to elicit talk about plural items. In order to elicit as many nouns as possible, the experimenter accompanied each picture by pre-prepared questions. For example, what happens when you go to the zoo/when you go to the supermarket?

Conversations (German and Hebrew only). Here, the idea was to examine plurals occurring naturally in the speech of a group of children in each age slot rather than the speech of a single child. In each language, the sample consisted of 6 age groups (2-2;5-year-olds, 2;5-3-year-olds, 3-4-year-olds, 4-5-year-olds, 5-6-year-olds, and 7-8-year-olds) consisting of three playgroups each, each playgroup containing three children – altogether 54 participants. Each group was recorded for half an hour during a freeplay session at home or in the play center.

Results. *Scripts:* As predicted, across the three languages, the proportion of noun plurals out of total nouns across age-groups and languages was over 50% -- no doubt, due to the nature of the task. The proportion of noun plurals increased from about one third of the nouns to 50% with age and schooling. Our second prediction was confirmed, as noun plurals with regular suffixation and non-changing stems constitute the bulk of our sample (over 60%).

Conversations: In the two languages compared, results for the youngest age-group (2-2;5) confirm our longitudinal findings, with plurals taking up only around 10% of all nouns. A significant developmental change was found, with plurals reaching as high as 30% in the older groups. Noun plurals with regular suffixation remain predominant across age-groups (above 60%), but results show an increase in the use of nouns taking slight to substantial changes in stem as a function of age. Finally, few over-regularization errors were found across our database.

These results will be discussed in view of the general developmental model presented in the symposium.

Longitudinal child speech and child-directed speech: Distributional analyses of noun plurals in Danish, Dutch, Austrian German, and Hebrew

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[1]University of Southern Denmark, [2]Antwerp University, [3]Austrian Academy of Sciences, [4]Tel Aviv University

Aims and background: The aim of this study is to identify noun plurals and characterize the distribution of noun plural categories in Child Directed Speech (CDS) and Child Speech (CS) in the four languages: Austrian German, Danish, Dutch and Hebrew. The study investigates the distribution of noun plural categories in actual usage and how it changes through age. We use our model containing suffix predictability and stem transparency starting with original sound-based analyses of the linguistic systems.

Predictions: CDS has been shown to account for emerging lexical and morpho-syntactic features in child language. We expect to find similar distributional patterns of restrictions in CDS and CS in all four languages mediated by the typological differences between Germanic and Semitic languages, on the one hand, and by language-specific differences, on the other. We predict that the way the system is represented in CDS across the four languages provides the child with clear and consistent information regarding distributional aspects both concerning types of plural suffixes and token-frequency of unproductive plural patterns.

Methodology**:** Systematic longitudinal analysis of spontaneous speech data: a cross-linguistic comparison of noun plurals in the input to and output of young children (in three of our four languages taken from the same sessions, whereas for Dutch input and output are not the same). Data are transcribed and coded using CHILDES (except that for Danish our OLAM system is used for coding). *Austrian German*: Three Austrian children aged 1;6-3;0, 1;7-4;3, and 1;3-6;0 recorded in their homes in spontaneous interaction with their mothers at intervals between one week (in the beginning) and one month. *Danish*: Two twin pairs aged 1;1-2;5 -- supplemented by other infant twins and parts of Plunkett's CHILDES-corpus -- recorded in their homes in interaction with their parents or caretaker at one month intervals. *Dutch*: The Dutch corpora in the CHILDES database: ten children providing information on CDS in the age range 1;5-5;6. CS-data stem from the CHILDES' Dutch triplets corpora of six children and from the unpublished Jolien corpus (Gillis 1997). *Hebrew*: The study is based on the Berman Longitudinal corpus: spontaneous interactions between four children aged 1;7-3;3, 1;5-3;1, 1;9-3;0, 1;4-2;4 and their parents recorded in their homes, at about ten days intervals.

Results: Some preliminary results based upon smaller corpora and in a less developed framework (Ravid et al. forthcoming) are that quantitatively, children's plural output is closely paced by the input they receive. Across our four languages, between 20% and 24% of the noun types young children are exposed to are plurals, while plurals constitute only 10% to 15% of the noun tokens in their input. The cross-linguistic data indicate that young children start the route learning about noun plurals from a small set of noun types and tokens, and that plural suffixes directed to children are much more predictable and regular than what we find in the adult system. The results presented at the symposium are discussed within the framework of our general developmental model.

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30
Symposium Number – S4-1

Chair: Marilyn Nippold, *University of Oregon*
Discussant: Marilyn Nippold, *University of Oregon*

Lexical and grammatical complexity in typical and atypical school-age children and adolescents

Description:

For the past thirty-five years, we have known that by age 5, children have access to the majority of the morphosyntactic structures of their language. Theories of both language acquisition and of language impairment are based on this finding. However, conversations with a five year old are markedly different from those with a child of ten or an adolescent of fifteen. How do they differ? Whereas we assume a larger and more diverse vocabulary with older children, there are other differences as well. Language development from this point on entails refining particular components - e.g. complex auxiliary verb morphology in English, derivational morphology in Hebrew - and developing the knowledge and facility to use syntactic structures effectively in various discourse contexts, such as telling a story or giving a speech.

This symposium brings together an international group of contributors to address both typical and atypical language development in school age children and adolescents. The papers investigate an array of semantic, syntactic, and discursive aspects of later language development using a variety of methodologies including elicited production, picture choice tasks, interviews and spoken and written texts.

Levie, Ben Zvi and Ravid examine effects of language impairment and socio-economic status on expressive derivational morphology abilities, and present surprising information on the interconnected nature of these two factors. Crutchley focuses on comprehension of non-literal language, and suggests that children's interpretation of unknown particle verbs relies on syntactic structure rather than semantic information.

Nippold and Vanderbush, Scott, and Reilly, Tolchinsky and Wulfeck explore syntactic complexity in different spoken and written genres (e.g. conversation, expository discourse, narratives, speeches). Each paper focuses on a different aspect of complexity. Nippold and Vanderbush find increased linguistic complexity in expository discourse; Reilly et al. find effects of planning time on accuracy and complexity; and Scott makes the case for the sensitivity of specific, rather than global, measures of complexity.

Increasingly, it is recognised that young children with language impairments continue to experience difficulties throughout their school years and beyond. Three of the five papers present data from both typically developing and language-impaired populations and draw conclusions that are pertinent to both theories of language development and impairment as well as designing therapeutic interventions.

Later language development is still an under-researched area. This symposium aims to highlight the subtlety and complexity of language developments in this age range, and to provide a forum to discuss implications of these findings for general theories of language acquisition and language impairment.

Capturing sentential complexity in naturalistic discourse of children 9 to 12: Comparisons of fine-grained and global measures

Cheryl Scott
Rush University Medical Center

Sentential complexity is of interest to researchers interested in developmental change and language impairment, and as a theoretical construct underlying language treatments (Thompson, 2007). Thompson and Shapiro (2007) summarized the following consensus features of complex sentences as: (1) the number of propositions (verbs), (2) the number of embeddings, (3) canonical vs noncanonical order, and (4) the distance between crucial (dependent) syntactic features.

To date, these features have not been routinely measured in naturalistic language produced by school-age children and adolescents. Rather, syntactic complexity is more often characterized globally in measures such as mean length of sentence (words/sentences) and/or clause density (*clauses/sentences*) (Scott, 1988). Although both measures increase slowly throughout school years (Loban, 1976), questions of validity and sensitivity are common. Additionally, the measures vary considerably as a function of discourse genre and modality. Measurement issues are compounded because complexity features are optional rather than obligatory and speakers/writers have choices about how they code complex semantic relations.

Several studies have suggested that more sensitive measures of complexity include the ability of children to (1) combine several *different* types of clauses within one sentence, (2) embed clauses at multiple levels, and (3) vary canonical clause orders. In the present research, an archival database (Scott & Windsor, 2000) was re-examined for the presence of these features. Questions included:

1. Are there age or ability differences in specific sentence complexity measures (as opposed to global measures)?
2. Do these measures vary according to genre and modality?
3. How do these measures relate to more commonly used global measures of complexity?
4. How do these measures relate to norm-referenced measures of oral language and reading comprehension?

Method: Participants were 60 children: 20 with primary language impairments (LI, M=11;5 years), 20 matched for chronological age (CA, M=11;6), and 20 matched for language age (LA, M=8;11). Participants produced spoken and written summaries of narrative and expository videos, for a total of 4 samples each. The resulting 240 texts were transcribed into a computer database with coding on all verbs that allowed for computations of the following measures:

1. Overall complexity: an index that sums clauses per sentence and assigns weights for clause type, depth of embedding, and noncanonical clause position/order
2. Number of sentences with 2+ subordinate/coordinate clauses
3. Depth of embedding
4. Noncanonical clause position/order

Results and Discussion: There were significant main effects of group on all measures. Comparisons with more global complexity measures (mean length of sentence, clause density) led to the conclusion that specific complexity measures are more sensitive to both age and language ability differences. Modality interacted with group, revealing modality effects specific to the CA group. Overall, written expository text was most conducive to specific complexity measures singled out for this study, but only in the CA group. Associations between complexity measures and overall language ability, nonverbal cognition, and reading comprehension are discussed. The measures explored in this study have considerable potential in language assessment with older children and adolescents, and in studies evaluating the effects of various language intervention protocols.

Derivational morphology and lexical knowledge in the development of the literate Hebrew lexicon

Dorit Ravid, Ronit Levie, Galit Avivi Ben Zvi
Tel Aviv University

Derivational morphology, a key facet of lexical knowledge, plays a critical role in organizing the mental lexicon. Derivational morphology constructs the form-meaning inter-relations between open class lexical items and hence is the major means for new-word formation. Research shows that at school age, vocabulary knowledge increases exponentially along with growth in morphological skills; moreover, studies indicate that morphological awareness makes important contribution to reading and spelling abilities, and that this importance of morphological knowledge for reading increases throughout the school years side by side with the growth of the literate lexicon (Carlisle, 2000). Lexical size, density and diversity are affected by the development of derivational morphology, and those two systems bootstrap each other (Anglin, 1993). For children growing up in a synthetic language such as Hebrew, knowledge and use of derivational morphology are crucial for expanding the literate lexicon and for the acquisition and consolidation of literacy (Ravid, 2004).

The current study investigates lexical and morphological development in Hebrew-speaking children and adolescents from four different populations: Normal Language Acquiring (NLA) speakers from middle-high and low socio-economic status (SES), and Language-Learning Disabled (LLD) participants from both SES backgrounds. In all populations, participants were divided into four groups by age and school grade level (1st-2nd graders, 3rd-4th graders, 5th-6th graders and 7th-9th graders). Choice of these populations

was motivated by the postulate that for children to achieve age-appropriate mastery of linguistic knowledge, they need to have access to an adequate threshold of relevant input, which may be hindered by two major factors: *cognitive* factors internal to the individual, and *socially* determined factors deriving from the external environment.

The study was designed to assess participants' ability to produce Hebrew nouns, verbs and adjectives in a variety of morphological structures and categories. Participants were tested orally and individually. They were presented with sentences containing a target item, and were expected to change it into a word in a different lexical class. For example, deriving an adjective from a noun as in a country that has lots of 'mountain-s' (Hebrew *har-im*) is … [*hararit* 'mountainous'].

Three different scoring scales were created to analyze morphological and lexical knowledge. Results indicate that morpho-lexical knowledge, as measured by these scales, increases and diversifies with age and schooling in all research populations. Furthermore, findings reveal a hierarchy which remains constant across analyses: NLA-HSES with the highest scores, LLD-LSES with the lowest scores, and the two other groups lying in between. The resemblance between NLA L-SES and LLD H-SES groups highlights new facets of the debate regarding the impact of cognitive and environmental factors on the efficiency of the language learning system.

Explaining the game of chess: Does knowledge drive linguistic complexity?

Marilyn Nippold, Dean Vanderbush
University of Oregon

It has been hypothesized that language development beyond the preschool years is fueled primarily by the child's burgeoning knowledge base and the associated drive to communicate complex thoughts. Although this is a reasonable hypothesis, little evidence exists to support its validity. One way to test this hypothesis is to examine a child's knowledge of a given topic and the degree to which linguistic complexity is employed when the child is prompted to talk about it in an exacting and detailed manner. The purpose of this study was to examine the extent to which linguistic complexity in two discourse genres, conversational and expository, is associated with a child's knowledge of the topic. School-age children ages 7 to 12 years old (n = 22) were asked individually to discuss the game of chess, first in a conversational genre and then in an expository genre. Children had been recruited from a variety of local chess clubs and schools, and all had volunteered to participate in the study. Each interview was audio-recorded, transcribed, entered into SALT, and coded for lexical and syntactic complexity in both genres. Each speaker's knowledge of the game was evaluated using a questionnaire and by analyzing the content contained in the child's explanation of strategies that are unique to chess. Specific aspects of linguistic complexity were examined in relation to the speaker's knowledge of the game. The results indicated significantly greater complexity in expository discourse than in conversational, particularly when a speaker was asked to explain the rules of chess and how the various pieces can move (e.g., "You gotta remember like if they have a rook here, and your king is here and you've got a bishop in the way, you can't move the bishop out of the way because your king would be in check" (boy, age 11 years). For example, mean length of T-unit was 9.93 words in expository discourse but only 7.53 words in conversational discourse, a statistically significant difference ($t = 6.81$, $p < .0001$). Theoretical implications of the study will be discussed.

Language in older children and adolescents with Language Impairment

Judy Reilly[1,3], Liliana Tolchinsky[2], Beverly Wulfeck[1]
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Children with Specific Language Impairment (LI) are of great interest because they show significant language delays in the presence of apparently normal cognitive abilities. Studies with younger children with LI have noted difficulties with phonology, grammatical morphology and complex syntax. Explanations for such profiles range from inaccessibility to certain grammatical features to constraints on processing capacity. Here we examine later spoken language development and writing in English speaking children and adolescents with LI in the context of expository texts. Investigating spoken and written language in this age group permits us to test competing perspectives on the nature of LI. If adolescents show the same morphosyntactic difficulties as younger children with LI, this would support a grammatical/linguistic account. Since writing, in contrast to speaking, allows time for planning and revision, if LI problems are due to processing speed, we would expect better performance in writing than spoken texts.

To address these questions, we have collected data from 16 children with LI (ages 10;00-15;11) and their age and gender typically developing (TD) matched controls on two tasks: a spoken and a written expository text. Children were told, "Pretend you are the teacher and you are giving a speech to the students on conflicts and problems and how to resolve them". First children gave the speech and then they wrote it. After writing, they were given an opportunity to revise their composition with a green pen. Spoken texts were transcribed according to CHILDES and mirror transcripts were produced from written texts. Coding included: 1) measures of linguistic structure (length, morphological errors, types and frequency of complex syntax and for the written texts, spelling and punctuation as well) and 2) measures of discourse structure (opening, positioning or stance, number and types of moves within the discourse and overall text level). For structural measures, proportions were created (number of propositions as a denominator) to neutralize length differences. In both the spoken and written texts, the LI group made more morphological errors than controls. In the written text, they also made more spelling errors than the TD group. Although the LI group recruited fewer complex sentences than the TD group, in calculating the types of complex syntactic structures, we found no differences across groups in either spoken or written forms; moreover they made few syntactic errors; performance was comparable to the TD group. For the LI group, frequent use of complex subordinators explicitly signalled the relation between elements, providing a coherent organizational structure for their expository texts. Although the LI group lagged behind their TD peers in the complexity and sophistication of their written texts, a significant proportion of the LI written texts were more elaborate and coherent than their spoken texts. The combination of a significant number of spelling errors and overall text coherence demonstrate an interesting and uneven developmental profile in the LI group where auditory processing or phoneme-grapheme mapping may be impaired, but with time and the opportunity to plan, and revise, the written texts of the LI group show surprising coherence.

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30
Symposium Number – S4-2

Chair: Clifton Pye, *University of Kansas*
Discussant: Clifton Pye, *University of Kansas*

A comparative study of Mayan children's verb complement forms

Description:
The papers in this symposium employ the comparative method to examine the acquisition of complementation types in five Mayan languages. The Mayan verb complex reflects a four thousand year history of complementation. It straddles the boundary between word and complex sentence, and presents children with the problem of learning inflections that reflect clause status. The symposium will

examine how children acquire inflections that reflect the types of complementation found in five Mayan languages: Yucatec, Chol, Q'anjob'al, Mam and K'iche'.

The comparative method provides a new methodology for the study of language acquisition. It begins with the identification of cognate forms across genetically related languages. The functional contexts of the cognate forms are then identified, providing a clear picture of the ways in which morphosyntactic inflections extend to new contexts in some languages and become more restricted in other languages. The comparative method makes use of this historical background to examine the acquisition of language-specific constraints on forms. Universal Grammar is widely invoked to account for the acquisition of such constraints, but UG cannot explain the acquisition of constraints due to historical change since they vary continuously rather than parametrically from one language to the next. In the case of the Mayan languages, complementation types vary by aspectual and lexical category.

Verb complexes in Mayan languages share a common template that includes affixes for aspect, subject and object agreement and verb status:

Aspect + Absolutive1 = (Ergative) + Root + (Derivation) + (Status) + Absolutive2

The ergative prefix cross-references the subject of transitive verbs while the absolutive affix cross-references the subject of intransitive verbs (and the object of transitive verbs). The aspect, agreement and status inflections vary by the context of complementation. Over time individual Mayan languages have departed from this template. Ergative subject marking occurs in Yucatec and Chol for intransitive verbs in the incompletive aspect. Ergative subject marking occurs in Q'anjob'al following the progressive verb, while in Mam it occurs in the context of a focused adverb. In these contexts, K'iche' continues to use absolutive subject marking on intransitive verbs.

The presenters have recorded longitudinal acquisition data from children learning each of the five languages. We selected samples from two-year-old children for this presentation. At this point the children are reliably using the status suffixes in their utterances. Children acquiring different Mayan languages initially produce different parts of the adult verb complex. Children acquiring K'iche', Q'anjob'al and Yucatec sometimes produce just the final syllable of the verb or omit the entire verb in addition to producing verb tokens with the root or the root and status suffix combined. The core issues we will discuss include the following:

1. The language-specific constraints on complementation types
2. Children's production of the different complementation types
3. The productivity of the complementation types in the children's language
4. The acquisition of the language-specific constraints on complementation
5. Children's overgeneralizations of the verb inflections
6. The Implications for theories of language acquisition

Introduction to the Mayan verb complex

B. Flor Canche Teh
Universidad Nacional Autónoma de México

This paper will introduce the structure of the verb complex in Mayan languages, and the ethnographic context of the recordings of the children's language. Mayan verbs reflect a four thousand year history of complementation in their inflectional structure, which led Robertson (1992) to label them verb complexes. The Mayan verb complex straddles the boundary between word and complex clause, and presents children with the problem of learning inflections that reflect clause status.

Verb complexes in Mayan languages share a common template that includes affixes for aspect, subject and object agreement and verb status:

Aspect + Absolutive1 + (Ergative) + Root + (Derivation) + (Status) + Absolutive2

The ergative prefix cross-references the subject of transitive verbs while the absolutive affix cross-references the subject of intransitive verbs (and the object of transitive verbs). The aspect, agreement and status inflections vary by the context of complementation. The indicative status appears in root clauses while the dependent status occurs in dependent clauses as well as with directional verbs. Nominalized verbs are used in nonfinite complements. Over time individual Mayan languages have departed from this template. Ergative subject marking occurs in Yucatec and Chol for intransitive verbs in the incompletive aspect. Ergative subject marking occurs in Q'anjob'al following the progressive verb, while in Mam it occurs in the context of a focused adverb. In these contexts, K'iche' continues to use absolutive subject marking on intransitive verbs. The changes reflect the extension of nonfinite complementation forms to new contexts of use.

The papers in this symposium are based on three hour language samples of two-year-old children learning the languages: Yucatec, Chol, Q'anjob'al, Mam and K'iche'. These languages represent four of the five main branches in the Mayan language family. Data from three children in each language were analyzed. The recordings were made in the children's homes. The children were free to interact with other members of their family or the investigators. The recording contexts include free play with objects and animals, meal times and interaction with the investigators. The children's families have very low incomes and largely rely upon agriculture for subsistence. Mayan children have few toys and books, and Mayan parents commonly do not make a practice of eliciting language from their children. In many cases, interaction occurred more frequently with older siblings rather than with the children's parents, although each family presents its own individual dynamic. Over the course of the three-hour recording sessions, the children produced between 265 and 732 utterance, and between 9 and 145 verb types. The children's parents produced between 150 and 800 utterances in the same recordings.

The acquisition of Mayan aspect

Barbara Blaha Pfeiler
Universidad Nacional Autónoma de México

Verbs in finite, nonstative clauses in Mayan languages typically bear a prefix or proclitic that expresses an aspectual contrast. Most frequently, the contrast is between incompletive and completive aspects, but other aspectual and modal contrasts include the imperative, potential and perfect. The aspectual contrasts are most developed in Yucatec, which has 13 of these forms. Some of these aspect markers are historically verb roots and can be separated from the verb by adverbs, which suggests that such constructions can be analyzed diachronically as instances of complementation. Mam and Yucatec have also added tense distinctions to their aspectual paradigms in the form of recent and non-recent completive contrasts. The aspectual prefixes typically coordinate with the status suffixes.

In addition to acquiring the aspect forms, Mayan children must also acquire an understanding of their use. The contrast between root and dependent clauses creates one of the main distinctions in the contexts of use for the aspectual prefixes. The main verb in a root clause has a prefix for the incompletive and completive aspects while a verb in a dependent clause may lack such a prefix, or as in Mam, have a specific prefix marking the dependent context. The progressive creates a context for dependent clauses in K'iche', Q'anjob'al, Chol and Yucatec, but only K'iche' allows the use of the incompletive prefix in this context; Q'anjob'al, Chol and Yucatec

treat the progressive as a nonfinite context which lacks aspectual marking. Mam extended its incompletive to mark the progressive, and thus treats the progressive as a single clause.

Mayan children must learn to make the aspectual/modal contrasts that apply to their languages as well as the aspectual distinctions that are made in different types of complement clauses. The incompletive aspect triggers the use of nonfinite complement forms in Yucatec and Chol, while Q'anjob'al, Mam and K'iche' express incompletives with root clauses. This paper will present acquisition data from two-year-old children learning each language. We present data from three children for each language, recorded in the children's homes, and focus on the children's use of the aspect prefixes in root and complement clauses. We examine whether Mayan children are guided by form or function in their production of root and complement aspect marking.

The children frequently omit the aspectual prefixes from verbs in their early productions. They do not reliably produce the aspectual prefixes until they are three years old. The late production of the aspectual prefixes is in marked contrast to the early production of the status suffixes. We find evidence that Mayan children recognize the language-specific constraints on aspect prefixes. Specifically, the children show early evidence of marking the distinction between root and complement clause contrasts in their use of aspect. The children's omission of aspect prefixes on verbs that have finite status suffixes indicates that Mayan children do not substitute nonfinite verb forms in finite contexts.

The acquisition of Mayan agreement

Carlos Carrillo Carreón
Universidad Autónoma de Yucatán

Mayan languages generally have an ergative agreement system in which an ergative set of pronominal prefixes cross-references the subject of transitive verbs and an absolutive set of affixes cross-references the subject of intransitive verbs and the direct object of transitive verbs. The absolutive sets are suffixes in Yucatec and Chol, and prefixes in Q'anjob'al, Mam and K'iche'. Mam innovated a set of enclitic particles that coordinate with the ergative and absolutive prefixes to cross-reference person. Mam maintains the distinction between the ergative and absolutive sets, but uses the prefixes to mark the distinction between first and non-first person, and the enclitics to mark the distinction between third and non-third persons.

Most Mayan languages do not have a uniformly ergative morphology; the ergative set is extended to cross-reference the subjects of intransitive verbs in contexts of complementation in some Mayan languages, creating split ergative systems (Dixon 1979). The child's task in learning a Mayan language is to discover which complementation contexts induce the use of ergative prefixes on intransitive verb stems, or how far they can extend the use of absolutive cross-referencing. The ergative cross-referencing on intransitive verbs is prototypically associated with the absence of an aspect proclitic and the indicative status suffix. The progressive and incompletive auxiliaries have been reduced to the point where they resemble the aspect proclitics in Yucatec and Chol. Q'anjob'al retains the indicative status suffix in its split-ergative contexts. The following table shows how these contexts differ between our five languages.

	Yucatec	**Chol**	**Q'anjob'al**	**Mam**	**K'iche'**
completive	absolutive	absolutive	absolutive	absolutive	absolutive
incompletive	ergative	ergative	absolutive	absolutive	absolutive
progressive	ergative	ergative	ergative	absolutive	absolutive
desiderative	ergative	ergative	absolutive	ergative	absolutive
focus adverb	ergative	ergative	ergative	ergative	absolutive
inceptive	ergative	ergative	ergative	ergative	ergative

Subject cross-referencing on intransitive verbs

This paper will present acquisition data from two-year-old children learning each language. We present data from three children for each language, recorded in the children's homes, and focus on the children's use of absolutive and ergative cross-referencing on intransitive verbs in root and dependent clauses. We rely upon the linguistic and non-linguistic context as well as the children's production of the status suffixes to distinguish between the root and dependent contexts. The children generally produce verb suffixes more frequently than verb prefixes at two years, and thus children acquiring Yucatec and Chol produce the absolutive markers earlier than children learning Q'anjob'al, Mam and K'iche'. Mam is exceptional, however, in that children learning Mam produce the cross-referencing prefixes earlier than the enclitic particles. Our data show that children learning these languages recognize the language-specific constraints on ergative marking by the time they are two years old.

The acquisition of Mayan status

Pedro Mateo
University of Kansas

The verb complex in most Mayan languages requires a status suffix that encodes clause type, verb transitivity, and mood. A special feature of the status suffixes across the Mayan languages is that they are subject to prosodic licensing; they change form or are omitted if another word follows in the same clause. The indicative status suffix was lost in Mam and Tzotzil when these languages added inflectional suffixes. The indicative status suffix only occurs in finite clauses in K'iche', while it was extended to nonfinite clauses in Q'anjob'al. In Yucatec, the indicative status suffix is only found with the zero third person absolutive suffix in the completive aspect. Chol preserved the indicative status suffix by innovating an epenthetic glide between the status and absolutive suffixes. The indicative status suffix is replaced by dependent and nominalizing suffixes when the verb appears in non-finite dependent clauses.

In this paper we focus on how Mayan children acquire the distinctions between root clause and dependent clause status suffixes in Yucatec, Chol, Q'anjob'al, Mam and K'iche'. Mayan children must learn the language-specific contexts of complementation types in order to use the status suffixes correctly. The contexts for intransitive verbs are shown in the following table.

	Yucatec	**Chol**	**Q'anjob'al**	**Mam**	**K'iche'**
completive	indicative	indicative	indicative	none	indicative
incompletive	nominalized	nominalized	indicative	none	indicative
progressive	nominalized	nominalized	indicative	none	indicative
desiderative	nominalized	nominalized	indicative	nominalized	indicative
focus adverb			indicative	nominalized	indicative
potential	dependent	nominalized	dependent	potential	dependent
movement	nominalized	nominalized	dependent	potential	dependent
directional			dependent	none	dependent
dependent	dependent	dependent	dependent	nominalized	dependent
non-finite	nominalized	nominalized	indicative	nominalized	nominalized

This paper will present acquisition data from two-year-old children learning each language. We present data from three children for each language, recorded in the children's homes, and focus on the children's use of status suffixes on intransitive verbs in root and dependent clauses. We examine the productivity of the status suffixes on the children's verbs, and the children's acquisition of the language-specific constraints on the use of the status suffixes. We pay particular attention to the children's use of the dependent and nominalizing verb suffixes to examine when the children show evidence of complementation. The children supplied the correct status suffixes in over eighty percent of obligatory contexts. Mayan two-year-olds show an awareness of the language-specific constraints on status suffix use in their languages. Q'anjob'al and K'iche' children extend the indicative suffix to incompletive contexts while Yucatec and Chol children do not. The children rarely overgeneralize the status suffixes between root and dependent clauses. The most frequent overgeneralization occurs when Q'anjob'al and K'iche' children produce the status suffixes in clause medial position.

Summary and theoretical implications

Clifton Pye
University of Kansas

The Mayan verb complex reflects a history in which auxiliary verbs or adverbs are introduced to mark aspectual distinctions and are later grammaticalized as aspectual proclitics. Many features of the verb complex are tied to the complementation status of the complex. Comparative study of the verb complex reveals how the inflectional features of complementation reflect historical processes. The complementation features of the verb complex are subject to reanalysis in the synchronic grammar as the proclitics change from auxiliary verbs to proclitics and finally prefixes. Mayan language learners receive conflicting evidence about the complementation status of the verb complex from the input, and must decide whether the linguistic objects they confront are nouns or verbs, complements or independent clauses.

The studies presented in this symposium demonstrate that Mayan children quickly sort out the appropriate contexts of use for the inflectional categories in their language. Although the features are coordinated in the adult language, Mayan children typically begin to produce them in an uncoordinated fashion. Mayan children produce the verb suffixes early and gradually include more of the verb prefixes. Mam represents an exception to this pattern in that children acquiring Mam display inordinate delays in the use of the enclitics marking person. Despite the uncoordinated pattern of production, Mayan children produce few overgeneralizations between root and dependent clause inflections.

The papers in this symposium introduce the comparative method of language acquisition research. The chief advantage of this method is that it brings into sharp relief language-specific constraints on functional morphemes that reflect historical change. These constraints are too varied to be considered part of Universal Grammar, and yet pose the same learnability challenges that Universal Grammar is supposed to resolve. If children can acquire language-specific constraints at the periphery there is no need to invoke Universal Grammar to account for the acquisition of core constraints. The examples of core constraints presented in the linguistic literature are artefacts of large scale comparisons across unrelated languages rather than the micro-comparisons that comprise the comparative method.

Linguists demonstrated long ago that the comparative method can be usefully employed to analyze the history of unwritten, non-IndoEuropean languages. The same cannot be said of current acquisition theories. Formal linguistic theories assume artefacts of European languages such as infinitives and nominative subjects can be generalized to all languages. Construction theories assume children have a limited number of functional contexts to identify. Research on the acquisition of non-IndoEuropean language reveals untested assumptions in these theoretical approaches and demonstrates that we have barely scratched the surface of children's ability to learn language. The use of the comparative method in language acquisition research brings new urgency to the task of documenting the acquisition of endangered languages while there are still children acquiring them.

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30
Symposium Number – S4-3

Chair: Sarah Van Deusen Phillips, *University of Chicago*
Discussant: Marie Coppola, *University of Chicago*

Beyond input: What orally educated deaf children teach us about language development

Description:

On-going research by Goldin-Meadow and her colleagues illustrates that deaf children whose hearing losses are so severe that they cannot acquire spoken language develop gesture systems to communicate with the hearing world around them by creating homesign, or idiosyncratic gesture systems that take on many of the properties of natural language (Goldin-Meadow & Mylander, 1984; Goldin-Meadow, 2003). Such systems are remarkably similar cross- culturally, indicating that all children come to the language learning situation prepared to develop what Goldin-Meadow terms the "resilient properties of language:" a lexicon, a means of stringing lexical items into sentences, and an ability to use words and sentences to fulfill linguistic functions. Building on this argument, the three papers in this symposium add detail to our understanding of deaf children's creation and use of homesign to fulfill these properties by elaborating on Goldin-Meadow's original finding on two levels: Cross-culturally and within in the homesign system. Our Cross-cultural work illustrates that the quality of the linguistic model matters in homesign development such that, if a deaf child lacks access to a

usable model in gesture, she will create her own system based upon the resilient properties of language. Building on this argument, our first paper illustrates that Spanish deaf children's manual systems pattern more like their mothers than they do their deaf counterparts in the other cultures due to qualitative differences in how Spanish mothers communicate with their children. Specifically, due to differences in their context, compared to the contexts of previously studied children, the Spanish children find more raw materials to work with, underscoring the features of resiliency laid out by Goldin-Meadow. Thus, we see that children will acquire a model to the extent that one is available and then build upon that model to devise their own means of satisfying the resilient properties of language where the models fall short. For the structure of homesign itself, our second paper investigates how an American homesigner develops complex noun phrases by examining the kind of complexity he creates and what motivations his need for increased descriptive ability. She accomplishes this by probing the structure within noun phrases and how the child situates them both syntactically and semantically within homesign. Relatedly, our third paper investigates the development of negation (marked by head shakes) in American homesigners, finding that it moves to fall within arguments rather than at their boundaries. This pattern reveals a developmental trajectory in the ability to negate, as well as a potential limitation on that trajectory imposed by the nature of homesign as a system that is constructed in the absence of a model for language development. The latter two papers illustrate how the deaf children "go beyond the input" (Golidn-Meadow, 2003) to work within the structure of their own systems to use them to fulfill an increasing range of linguistic functions.

A mother's hand: Maternal gesture and lexical acquisition in Spanish deaf children

Sarah Van Deusen Phillips
University of Chicago

In continuing research into the development of homesign, Goldin-Meadow and her colleagues have illustrated that, cross-culturally, homesign systems are remarkably similar to each other despite the fact that deaf children are growing up in significantly different linguistic contexts. To date, we have found that American, Taiwanese (Goldin-Meadow & Mylander, 1998) and Turkish (Sancar et al. below) deaf children create homesign systems that are more similar to each other than they are to the gesture activitiy of their parents, suggesting that their parents' speech-accompanying gestures are not serving as useful linguistic models for them as they go through the early stages of language development. However, my own work with orally educated Spanish children produces a much different result: The children's manual communicative systems more closely resemble their mothers' gesture patterns than they do each other's or the homesign systems of American, Taiwanese and Turkish children. Though mothers in all three cultures gesture as they engage their deaf children in communication, the Spanish mothers show a qualitative difference in the number of lexicalized gestures that they produce as they communicate with their children. The result is that the Spanish children come to model their homesign lexicons on their mother's gestures and to use those gestures to fulfill the same discursive functions for which their mothers use gesture in interaction. In coming to this conclusion, I have taken an interaction-based approach to parents' gesture and children's manual communication. Specifically, my work focuses on how the manual modality shapes the discursive activities of four families of orally educated deaf children with cochlear implants in the Castilian speaking regions of Spain. In this approach, the children's communicative abilities in the manual modality are used as a recursive tool for analyzing the speech-accompanying gestures that parents use when engaging their deaf children in co-constructed discourse. This approach recognizes the parent's linguistic performace as both spoken and embodied, which has implications for understanding how all children might take advantage of gesture as they acquire language and enter into a community's meaning systems.

Descriptive hands: Noun phrase development in homesign

Dea Hunsicker
University of Chicago

Homesigners are the profoundly deaf children of hearing parents who are not exposed to any conventional language system. Without access to spoken language or exposure to sign language these children create their own gesture system to communicate with those around them. Prior research has shown that David, an American homesigner does make a distinction between nouns and verbs in his gesture system (Goldin-Meadow, Butcher, Mylander & Dodge 1994). This research investigates whether David develops complex noun phrases in his homesign system. We're interested in what kind of complexity he creates, and what motivates the development of more descriptive ways to refer to objects and people in addition to simple points. We examine structure within the noun phrases, and how he situates them within his homesign system both syntactically and semantically. Preliminary results suggest that complex phrases do develop over time, and that the order of gesture production may vary based on semantic function.

Negation in American homesign systems

Amy Franklin
Rice University

In this study, I further explore the language properties of home signs through an investigation of negation in an American deaf child's system. Side to side headshake as a negation marker is found in many sign languages including American Sign Language (Baker & Cokely, 1980; Liddell, 1980), British Sign Language (Lawson, 1983), Sign Language of the Netherlands (Coerts, 1992) and International Sign (Webb & Suppalla, 1994). This paper presents the expression of negation in American home sign. Negation in hearing English speaking children follows a developmental trajectory in which the negative element occurs first at the edges of the kernel sentence before becoming internal to the sentence string (Bellugi, 1967; Bloom, 1970). The current project maps the developmental trajectory of negation in children not exposed to a conventional language model. Our results indicate a developmental step in the inclusion of a negative headshake to a gesture string. Further, the children in our sample produce negative elements initially external to their gesture strings with only a subset of the children producing string-internal negative headshakes. These results suggest the resilience of negation's developmental trajectory, as well as its limitations. Negation may be initially produced externally by all children but may require a more advanced system (either provided or generated) to propel negative elements into a sentence. Additionally, negation meaning also changes over time from rejections and non-existence to denials. In order to determine whether these results can generalize to headshake use in the manual modality, or whether these results reflect language creation within home signing systems, headshake use and patterning are explored in English speaking children.

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30
Symposium Number – S4-4

Chair: James Scobbie, *Queen Margaret University*
Discussant: Fransisco Lacerda, *Stockholm University*

Instrumental analysis of child speech

Description:
This symposium is directed towards the conference theme of "New methods in child language research". The study of speech articulation in children is a particularly challenging methodological area, which is unfortunate, given the valuable information that can be gained from it about the intended output of the child speaker. Instrumental articulatory phonetics laboratories tend to be rather uncommon, and thus research in this area tends to be unfamiliar on a first-hand basis, even to those experienced in quantitative analysis of acoustics. And, on the other hand, instrumental methods available tend to be invasive and aimed at adults and experimental, laboratory-based study. Initial successes in using articulatory techniques with children arose from the pressing need to understand (and treat) development and non-developmental child speech disorders. The papers to be presented in this symposium highlight both innovative methods (such as ultrasound tongue imaging); longer-established ones (such as electropalatography, and electroglottography) which have rarely been used before with typically-developing children; and acoustic analysis used for fine-grained phenomena relevant to the emerging phonological system.

Though innovation is more clearly demonstrable in the papers using articulatory techniques, acoustic analysis is not underestimated or absent from the research presented. Articulatory methodology partners the objective and quantitative approach to the study of child speech production pioneered in acoustic analysis. Articulatory data is at its most obviously valuable for theoretical phonology when it provides information on what cannot be heard, and acoustic data has a particular power when it analyses in children's audible output what cannot easily be categorised in the adult system.

We envisage 4-6 papers with their own individual approach, exploring a variety of different phenomena in developmental speech production and phonology, with a discussant able to summarise the production themes and reflect on them from a perceptual perspective as well. Common theoretical themes will be individual and social variation, the relationship of articulation to acoustics, and that of phonetics to phonology, as well of course as important methodological issues. Papers will demonstrate the application of familiar techniques in innovative ways as well as introducing unfamiliar ones. We aim to include presentations using

• Ultrasound Tongue Imaging, which can instantly provide qualitative information on large numbers of participants or be used quantitatively to provide information on articulatory development, such as /r/ acquisition.

• Electopalatography, which is ideal for quantitative analysis of tongue-to-hard palate contact patterns in stops and fricatives and has largely been used developmentally in clinical research hitherto.

• Electroglottograhy, which enables more a direct and direct analysis of pitch for intonational analysis than an acoustic signal, and avoids interference from background noise, e.g. in a nursery.

• Acoustic analysis, which is ideal for relating articulatory to acoustic events and augmenting subjective auditory transcription, e.g. to probe subtle aspects of phonology and phonetic development on the interface of these domains in the difficult areas of formant analysis and phonatory quality/frication.

Acquisition and loss: An articulatory sociophonetic investigation of postvocalic /r/ in young Scottish speakers

James Scobbie[1], Eleanor Lawson[1], Jane Stuart-Smith[2]
[1]*Queen Margaret University,* [2]*Glasgow University*

Scottish English is often cited as a phonologically rhotic dialect of English. However, in the 70s and 80s, researchers first noticed that postvocalic /r/ was in attrition in Glasgow (Macafee, 1983) and Edinburgh (Romaine, 1978; Speitel and Johnston, 1983) among older children and adults. This was confirmed by Stuart-Smith (2003), who clearly showed that postvocalic /r/ as a canonical phonetically rhotic consonant is being lost in working-class Glaswegian speech. It is also well known that /r/ is among the last of the English consonants to be acquired, especially in postvocalic position (Scobbie, Gordeeva and Matthews, 2006). This raises interesting questions about the interplay between language acquisition on the one hand, and variation and change on the other. For example, it may be that late acquisition and diachronic loss are related.

However, standard methodologies are not sufficient for exploring these relationships in the case of Scottish /r/. First, Stuart-Smith (2003) showed from auditory and acoustic analysis that the situation is more complicated than simple between /r/ vs. zero. The derhoticized quality of /r/ was gradient and it is this which varies socially. While middle class and older speakers were clearly rhotic, young male working class speakers in particular often produced sounds for /r/ that were difficult to identify or classify. Second, articulatory research with adults using Ultrasound Tongue Imaging (Scobbie and Stuart-Smith, 2005) revealed something more unexpected: in pre-pausal position, some weakly rhotic speakers made a clear and strong articulatory retroflex tongue motion, but one which was so timed as to generate little or no acoustic rhoticity.

Thus, while a traditional analysis of the acquisition of /r/ would be revealing, two other factors have to be taken into account. First, the social variation of the speakers is crucial, and second, direct articulatory study is essential. There is, however, no prior study of which we are aware which attempts to investigate these various factors.

In this talk, we report preliminary methodological and descriptive results which support the use of ultrasound as an instrumental method capable of studying aspects of both socially stratified articulatory variation and the articulation of children and teenagers, groups for whom more invasive methods may not be motivated or successful. However, the technique requires technical refinement for effective use in recording locations outside the laboratory (e.g. in school, at home). Moreover, the potential impact of using the equipment on very young children's speech and speech style is not yet known.

We will present results from three studies, then discuss their relevant to issues of acquisition and language change, and specifically, patterns of /r/ production will be summarised. The first two studies have subjects aged 12-13. The design of the first study has allowed the effects of Ultrasound Tongue Imaging on vernacular speech variables (such as glottalling) to be quantified in wordlist speech, and we will present new results from spontaneous speech. The second study is the first socially-stratified corpus of spontaneous and wordlist speech incorporating articulatory data, which we will illustrate. The third study will be undertaken in 2008, we will present preliminary results. It will examine /r/ production in much younger Scottish children.

Aspiration or breathy voice? – Speech development beyond adult perceptual boundaries

Fredrik Karlsson
Umea University

The study of child speech entails an increased level of difficulty compared to investigations of normal adult speech due to the immature nature of the output form. As discussed by Oller (2000), a transcription-based approach to child speech studies offer enormous

challenges to the adult observer as the resulting transcription of an utterance made by a child at the early stages of development may be very different from the original utterance when read aloud by an adult (Oller, 2000).

In addition, the risk of a bias towards the native language of the observer is always present. Early productions made by children may often have acoustic properties that do not clearly uphold the distinctions in the ambient language. Thus, immature productions may result in two observers with conflicting perceptual categories producing differing representations. Transcription may therefore in these cases be viewed as not having necessary properties to afford an accurate analysis of child speech development.

A fine grained instrument for child speech study is, however, offered by acoustic analysis. Numerous investigations (e.g. Eguchi and Hirsh, 1969; Kewley-Port and Preston, 1974; Catts and Kamhi, 1984) have used acoustic methods in order to provide a detailed description of child speech maturation judged to be within a specific phonetic category, from the time when the phonetic property is perceived as being attempted.

However, acoustic analysis may also afford the investigation of productions from a viewpoint that decreases the necessity of a perceptual judgement by the adult perceiver. In a case study based on a single child, Karlsson et al. (2003) were able to show that the observed instances of breathy voice productions occurred significantly more often and were significantly longer in duration when the target plosive was aspirated compared to when it was unaspirated. Thus, although the intensity of the fricative noise following the release burst was not strong enough to be perceived as an attempted aspiration, the acoustic analysis revealed a distinct pattern of usage by that single child.

In this presentation, an analysis of the attempted manifestations of aspiration by 22 children acquiring Swedish, aged 1;8 – 4;6, will be presented and the results discussed.

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Articulatory variability in typically developing (TD) children: EPG analysis of fricatives

Claire Timmins[1], Joanne McCann[1], William Hardcastle[1], Sara Wood[1], Jennifer Wishart[2]
[1]Queen Margaret University, [2]Edinburgh University

Speech production variability has been noted to differ between children and adults when performing repetition tasks. Children are found to be much more variable than adults when measuring temporal and acoustic variability of consonant productions (Lee et al, 1999).

Most research on variability in children's consonantal productions focuses on temporal and acoustic variability in TD children (Smith et al, 1996; Munson, 2004) but recent use of EPG (Electropalatography) in speech analysis can provide more information on variability, in particular, spatial variability in consonant production.

EPG is a computer-based analysis tool that records the timing and location of tongue contact with the hard palate during speech articulation (Hardcastle & Gibbon 1997).

Using Articulate Assistant software, EPG allows the calculation of a spatial variability index, based on tongue-palate contact patterns.

There have been a few studies of variability using EPG. Cheng et al (2007) found increasing stability of tongue-palate contact in /t/, /l/, /s/ and /k/ from young speakers to adults using the spatial variability index (though not significant). Tabain (2001) studied fricative production in adults and found differences depending on place of articulation and context. Timmins et al (2007) noted similar results (higher spatial variability for /ʃ/ compared with /s/) in a group of TD children.

This paper aims to provide a more detailed analysis of spatial variability (along with temporal variability) in the production of /s/ and /ʃ/ in 8 TD children aged 4 to 7 years (mean = 5;11). The variability measures of ten repetitions of /s/ in 'sun' and /ʃ/ in 'sheep' from these speakers will be compared with productions of the same dataset from 8 adults.

The results confirm findings from studies indicating spatial variability differences between adults and children. We also find that fricative variability is dependant on place of articulation for both groups of speakers.

References:

Cheng, H. Y. et al (2007) Electropalatographic Assessment of Tongue-to-Palate Contact Patterns and Variability in Children, Adolescents, and Adults. Journal of Speech, Language and Hearing Research, 50, 375-392

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Development of a language-specific vowel quality: Evidence from Swedish

Felix Schaeffler
Queen Margaret University

This study investigates the development of the Swedish long a-vowel quality in two children between the age of 19 to 31 and 16 to 26 months, respectively. The Swedish long /a/ has a characteristic low back quality. Low back vowels are not part of the earliest vowel productions of infants, presumably because they require independent movement of the mandibula and the tongue. Vowels of this type are therefore ideal objects of study for the onset of language specificity, as long as children are recorded continuously over a critical period of time.

The study is based on a combination of acoustic and auditory measurement techniques and aims at describing the time course and characteristics of the development towards this specific vowel quality.

Both children were recorded in a sound protected room at the Department of Linguistics at the University of Umeå, Sweden. The utterances were elicited by showing pictures to the children, with drawings referring to the target words. Usually the parents participated in the recordings and interacted with the child. The material contained several target words, but for the current study only seven words containing a long /a/ in Standard Swedish were used. All words had a CVC or CVCC structure. Acoustic analyses of formant values were carried out with various techniques as the determination of formant values in child speech is notoriously difficult.

The results suggest a three-partitioning of the course of development for one child, and a two-partitioning for the other child. None of the children shows low back targets in the initial stages of recording. Words with these vowels are mainly uttered with low front vowels, indicating that the children had better command on the high-low dimension than on the front-back dimension. Following this

stage, one child shows varied productions of low-back together with low-front or mid vowels.The third stage for this child was a consistent production of the Swedish target vowel, approximately from month 28-29. The second child showed a more or less direct transition to target-like productions without an intermediate varied stage. Correlation with syllable structure development suggested that target-like vowel productions roughly coincided with the emergence of consonant codas, but clearly preceded onset cluster development.

Symposium Session 4 - Tuesday 29 July 16.30 - 18.30
Symposium Number – S4-5

Chair: Gert Westermann, *Oxford Brookes University*
Discussant: Andrea Krott, *University of Birmingham*

Statistical approaches to the development of inflectional morphology

Description:
The mechanisms underlying the processing of inflectional morphology are subject to intense debate. One view holds that regular and irregular forms are generated by two qualitatively distinct mechanisms - rule application for regulars and memory storage for irregulars. Another view claims that a single, associative mechanism suffices to produce all forms. This symposium presents four papers that provide evidence for an associative view by investigating in detail inflection error patterns and reaction times in children of different age groups and language backgrounds. From these papers a view emerges in which the production of inflections is governed by the interactions of multiple soft constraints arising from intrinsic (e.g., phonological form) and extrinsic (e.g., relationship to other words) properties of the inflected words.

Paper 1 investigates error patterns in 2- to 4-year-old children producing the English past tense. Acquisition is described as achieving a balance between source-oriented and product-oriented schemas. The authors argue that source-oriented schemas ('add –ed to a stem') lead to overgeneralizations, and product-oriented schemas ('past tenses end in –ed') to errors of omission when the stem of a verb already sounds like a past tense form. Analysis of error data from a large corpus of 2-4 year old children suggests that early past tense production is based on product-oriented schemas before the onset of source-oriented generalizations.

Paper 2 investigates errors and reaction times in an English past tense production task with 11-year-old children and adults. Based on the associative view that processing differences occur according to how 'easy' or 'hard' a verb is to process, stimulus verbs are classified as easy or hard based on a number of statistical features (frequency, phonological complexity, phonological neighbourhood etc). Results show that easiness predicts reaction times in 11-year olds and adults, but regularity does not, providing strong evidence for the associative view of inflection learning.

Paper 3 investigates the effect of bilingualism on error patterns in the English past tense in 5-11-year-old Chinese-English bilinguals and French-English bilinguals. It is shown that the bilingual child's other language affects the type of errors made in English. Chinese speakers produce more root verbs and irregularizations, whereas French speakers display more overregularizations. These errors correspond to the tense marking in the other language (none in Chinese and added morphemes in French), supporting the view of inflection development as an outcome of statistical constraints.

Paper 4 discusses two inflection systems with markedly different distributional properties from the English past tense: the German participle and noun plural. Error patterns from an extensive corpus of spontaneous speech from 1;4-3;8-year-old children suggest a system of multiple, mostly probabilistic regularities that are based on the phonological form of the verbs and nouns. The authors argue that these results are incompatible with dual-mechanism accounts.

The symposium will end with a discussant and a general discussion.

Discovering morphology: The inflection of verbs between two and four years

Anna Theakston, Danielle Matthews
University of Manchester

Few areas of child language have been better studied than inflectional morphology, particularly the acquisition of the English past tense. However, although a lot is known about what affects children's over-regularization errors (e.g. "He goed to the shops"), we know very little about how children first discover morphological patterns, for example the past tense –ed, in order to over-use them. Children's knowledge of the past tense may be based on a number of interweaving generalizations. Thus Bybee & Slobin (1982) proposed that children generalize both product-oriented and source-oriented schemas when learning about inflectional morphology. Product-oriented schemas are generalizations about the properties of inflected forms (e.g., "past tenses tend to end with /t/ or /d/"). Source-oriented schemas are generalizations about how an inflected form is composed of a stem and an inflection (e.g., "to make a past tense, take a verb stem and add *-ed*"). Adult-like mastery is proposed to be achieved by balancing product-oriented schemas and source-oriented generalizations with knowledge of irregular idiosyncrasies. That children have something like product-oriented schemas is perhaps best evidenced in the distribution of errors of omission which occur when children produce a stem in place of its inflected counterpart (e.g., saying "*Yesterday he mend the bike*" instead of "*mended*"). These errors occur more with verbs whose stems already end in d/t and thus sound like past tense forms – i.e. the stem maps on to product-oriented schema for past tense forms. Evidence of source-oriented schemas is seen in over-regularizations. While both types of errors are well documented in children over the age of four (e.g. Marchman, 1997; Matthews & Theakston, 2006), very little is known about when generalizations of different types are first discovered. The current study seeks to address this developmental question by eliciting a large data set of inflected verbs from children in the first few years of combinatorial speech (two to four-year-olds). By measuring the rates of correct production, errors of omission, over-regularizations, irregularizations and double marking errors (e.g. 'camed') we can chart when evidence of a variety of generalizations first appears.

We are currently collecting a database of elicited past tense forms for the 300 most frequent verbs in child directed British English. 400 two- three- and four-year-olds will take part in the study. Preliminary results from 52 children indicate a significant increase in the rate of both correct and over-regularized responses over the 2 to 4-year age range and a significant decrease in the rate of errors of omission. Two-year-olds made a large number of errors of omission (45% of responses), especially with verbs whose stems already end in d/t (65% of responses). Children this young rarely over-regularized verbs (< 20% responses), whereas over-generalizations were the predominant response type for older children. We take this to suggest that children first form generalizations of the product-oriented type before becoming able to productively use the past-tense. With data for the full set of 300 verbs we will also present analyses of how the frequency and phonological properties of verbs affect correct and erroneous production.

Dissociating easy and hard verbs in the development of the English past tense

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[1]Oxford Brookes University, [2]Oxford University

For over 20 years the mechanisms underlying the processing of verb inflections have been subject to intense debate. The dual-mechanism theory holds that regular and irregular forms are generated by two qualitatively distinct mechanisms, namely rule application for regulars and memory storage for irregulars. Single-mechanism views claim that a single, associative mechanism is sufficient for producing all forms. Whereas dual-mechanism approaches explain processing dissociations between verbs by the different underlying mechanisms, single-mechanism views explain them by statistical and distributional factors. Combinations of these factors make verbs 'easier' or 'harder', with harder verbs being more error prone and slower to process.

Here we directly compared both approaches by investigating the precise nature of dissociations between verbs in a speeded elicitation task.

We annotated a large corpus of English verbs from the CELEX database along a number of factors (stem and past tense frequency, length, phonological complexity, phonological friends and enemies, age of acquisition, imageability, familiarity, stem-final d/t) and used these to classify each verb as 'easy', 'intermediate' or 'hard'. We used a stimulus set of easy, intermediate and hard regular and irregular verbs in a past tense speeded elicitation task with 16 11-year old children and 18 adults. This task allowed for direct comparison between dual- and single-mechanism approaches: a dual-mechanism account predicts dissociations between regulars and irregulars irrespective of easiness, and a single mechanism account predicts dissociations between easy and hard verbs irrespective of regularity.

Results showed a significant effect of easiness on reaction times in 11-year olds and adults. Regularity had a marginal effect in 11-year olds but no effect in adults. These results indicate that verb inflection is best explained by a single associative mechanism that is sensitive to the statistical and distributional factors of verbs, but not to the grammatical class of verbs. The marginal effect for regularity in 11-year olds indicates that 11-year olds may have extracted the '–ed' rule and used it in the elicitation task. Processing in adults, by contrast, was not based on this rule. This was also evident in the error patterns of the two groups: 11-year olds produced more overregularization errors (21.4%) than irregularizations (1.6%). Adults showed low rates both for overregularizations (3.0%) and irregularizations (1.6%).

Together these results point towards the gradual learning of verb inflection in a single, associative system on the basis of statistical and distributional factors.

Knowing two languages affects children's past-tense production

Jianhui Song, Elena Nicoladis
University of Alberta

Children's accurate and productive acquisition of morphology is highly dependent on input frequency (e.g., Clark, 2001). Bybee (1995) has argued that type and token frequency affect acquisition differently. High token frequency leads to entrenchment and high accuracy of a form. High type frequency leads to productivity.

The effects of frequency are striking in the acquisition of the English past tense. Most verbs form the past tense with the addition of –ed to the root (i.e., regular verbs) while some verbs do not (e.g., *rang*; i.e., irregular verbs). Many irregular verbs are high in token frequency while regular verbs are less so. English-speaking children are generally more accurate with the regular than the irregular past tense (e.g., Kuczaj, 1977).

Bilingual children hear less of either language than monolinguals, a fact that should particularly affect token frequency. Nicoladis, Palmer, and Marentette (2007) found that French-English bilingual children produced fewer correct past tense forms of irregular verbs in English than monolinguals. The same result held for regular verbs, suggesting that a certain level of token frequency of regular verbs is necessary for children to discover the regularity.

In this study, we test the generalizability of those findings by including bilinguals who speak different language combinations. In addition to speaking English, the bilinguals in the present study spoke either Mandarin Chinese (a language that does not mark verbs for tense) or French (a language with a different pattern from English of frequency relative to regularity in the past tense).

Fourteen Chinese-English bilinguals, between 5 and 11 years, participated in this study, along with fourteen French-English bilinguals, matched on age. Most of the children had grown up learning both languages simultaneously, although some had learned English after either Chinese or French. The children watched a cartoon and told the story back, once in each language. We measured the number of word types in the children's retellings as an estimate of vocabulary (bilingual children's vocabulary is correlated with exposure time). There was no difference between the two bilingual groups on numbers of word types used.

In English, the French speakers were more accurate with regular verbs than irregular verbs while the Chinese speakers showed a slight tendency to be more accurate with irregular verbs than regular verbs. When the children made errors, the Chinese speakers produced many root verbs and more irregularizations (e.g., *rung*) than overregularizations. The French speakers often produced the present tense and produced some overregularizations but no irregularizations.

These results show that the other language spoken by a bilingual child affects English past tense production. The Chinese children tended to produce a past tense verb as a single morpheme, either the root or an irregularization. In contrast, the French children marked the verbs for tense, even when they were not accurate with the tense or the irregularity of the target verb. The children's experience with tense-marking morphemes in their other language, affect their English production. These results are discussed in light of previous explanations of children's acquisition of past tense inflections.

Acquiring German inflections: Not dual but multiple mechanisms

Barbara Stumper, Gisela Szagun
University of Oldenburg

The dual mechanism model of inflectional learning assumes a symbolic rule which handles regular inflection and storage in associative memory for irregular forms. The regular/irregular dualism has been applied to the German plural and participle systems (Clahsen, 1999; Clahsen et al., 2007). However, the empirical evidence presented in its favour makes use of error data which do not occur in children's speech. Thus, its relevance for acquisition is unclear.

It is argued here that inflectional learning in German consists of the construction of systems with multiple regularities. The acquisition of noun plurals and participles is studied using the most comprehensive empirical evidence available so far (Szagun

corpora, 2004) which consists of the spontaneous speech samples of 22 children between 1;4 and 3;8, six of whom were recorded every 5-6 weeks and 15 every 20 weeks.

a) Plural: German noun plurals display multiple regularities which are based on the co-occurrence of gender and/or phonological patterns in word endings. Most regularities are of a probabilistic nature, some deterministic. There are five suffixes: *-n*, *-s*, *-e*, *-er*, *-Ø*. The latter three can combine with *Umlaut*. Growth of type frequencies in the different plural classes in child speech corresponds to input frequencies per class. Errors adding *–s* and *–n* and partial marking errors do not differ in frequency. The *–n* error occurs after plural *–e* (*Tier-e-n*) reflecting the rule that nouns ending in *–e* in the singular take an *–n* plural. The *–s* error occurs most frequently for words ending in *–er* which is pronounced [a], reflecting the rule that words ending in an unstressed vowel have an *–s* plural. Partial marking, i.e. either suffix or *Umlaut*, occurs most frequently for the *–e* + *Umlaut* plural class in which *Umlaut* is least predictable. Children's error patterns thus reflect the regularities of plural formation. The data do not confirm the prevalence of the *–s* error and its indiscriminate use as predicted by dual mechanism theory. Errors, including the *–s* error, occur in analogy to the multiple regularities of plural formation (Szagun, 2001).

b) Participle: German participles are formed by an *–n* or *–t* suffix, *-t* suffix being classed as regular. Vowel change is also possible. Most participles also have a prefix ge-. For separable verbs, *ge-* is in second position (*auf-ge-standen*). Children's errors in descending frequency consist of: 1) omission of prefix *ge-*, 2) omission of a suffix, 3) incorrect suffix, mostly *–t* instead of *–n*, but occasionally *–n* instead of *–t*, 4) incorrect position of *ge-*, 5) incorrect vowel (Szagun, in preparation). Dual mechanism predicts only error 3) as *–t* instead of *–n*, arguing that children regularize irregular forms. Children, however, commit a variety of errors.

It is concluded that the dual mechanism model is inadequate to explain the acquisition of plural and insufficient to explain the acquisition of participles. German inflectional systems consist of multiple regularities which are constructed by generalisation based on analogy and us of input frequency.

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00
Symposium Number – S5-1

Chair: Sarah Haywood, *University of Edinburgh*
Discussant: Melissa Preissler, *University of Lancaster*

Language processing and linguistic abilities in Autistic Spectrum Disorder

Description:
Recent estimates suggest that Autistic Spectrum Disorder (ASD) affects as many as 1 in 100 people (Baird et al., 2006, The Lancet). Alongside social difficulties and restricted interests, delayed or impaired language is one of the hallmarks of ASD. This symposium aims to showcase state-of-the-art research related to language processing in this pervasive developmental disorder.

Much research in ASD has focussed on the impact of language impairment on other aspects of development, or on the consequences of social difficulties for language outcomes. Less is known about language mechanisms themselves in ASD: What are the features of acquisition and processing for children with this diagnosis, and how do they differ from those of typically developing children? Which aspects of processing help to compensate for other difficulties? What are the different profiles of language ability within the ASD population, and how common are these patterns of strength and impairment? Answers to these questions are important in designing effective interventions for ASD, and in understanding the architecture of the language system that underlies social, communication and behavioural difficulties associated with the diagnosis.

This symposium examines the full spectrum of language processing, including phonological skills, word learning, syntactic processing, semantics, and pragmatic inferences. Experimental findings will be set against the backdrop of data from a large-scale epidemiological study that examines the prevalence of different profiles of language (dis)ability in ASD.

Two papers examine processes of word learning in early development, and ask whether children with ASD are sensitive to the same kinds of cues as typically developing children of the same age. Two further papers discuss sentence-level processes, in production (expressive language) versus comprehension (receptive language). The first discusses the tendency to imitate a conversational partner's use of syntactic form, which is pervasive in "normal" language processing. The second focuses on children's use of syntactic and semantic context during on-line comprehension.

All four papers suggest that children with ASD perform similarly to (or even out-perform) typically developing children under some circumstances, which would not be predicted on a simple "disability" model of the disorder. Developing this theme, a fifth paper reports prevalence data for language impairment in ASD, and suggests that children with language impairments may represent a particular subtype within a broader spectrum. The symposium will highlight the complex relationship between language difficulties and other autistic symptoms, and we hope that it will offer an exciting opportunity to discuss the relative linguistic strengths and weaknesses in children with ASD.

Language abilities in ASD: Evidence from an epidemiological sample

Tom Loucas[1], Gillian Baird[6], Tony Charman[2], Andrew Pickles[3], Emily Simonoff[4], Susie Chandler[2], David Meldrum[5]
[1]University of Reading, [2]University College London, Institute of Child Health, [3]University of Manchester, [4]Kings College London, [5]Chatswood Assessment Centre, [6]Guy's Hospital, United Kingdom

Language impairments (LI) are a hallmark of autism spectrum disorders (ASD). The broad language characteristics, specific pattern of LI, and the association between LI and other aspects of autistic presentation remain open questions in part because many past studies have relied on clinically referred samples with their attendant biases. This presentation will offer new epidemiological data from the Special Needs and Autism Project (Baird et al., 2006) about language abilities in children with ASD. These data add to existing empirical evidence and provide the opportunity to further develop the theoretical accounts of association between ASD and LI. Language presentation in ASD is heterogeneous. Early literature suggested that 50% of children with autism were nonverbal, although more recent estimates suggest a lower figure. In contrast some show language skills in the average range, including children with no history of language delay (those with Asperger's syndrome). A significant minority of children show early language regression and subsequent poorer outcomes. Perhaps the majority of individuals with ASD have a language skills associated with more general intellectual disabilities. However, another group, those with ASD and LI (ALI) have nonverbal abilities in the average range but poor language, showing a cognitive profile similar to children with specific language impairment (SLI). The epidemiological data presented will address how common these different broad language subtypes are. In addition the characteristics of one subtype, children with ALI will be reported, as this group offers the opportunity to investigate the specific impact of LI on autistic symptomatology and conversely the impact of ASD on language abilities.

Methods: Participants were a stratified sample (N=255) of a total population cohort of 56,946 seen as part of study to ascertain the prevalence of ASD, aged 9 to 14 years. All children received an ICD-10 clinical diagnosis of ASD or No ASD following an extensive diagnostic, language and cognitive assessment. The association between ASD and LI in high-functioning children (nonverbal IQ $\geq$ 80)

was further investigated in a subsample (N=97) who were divided into those with LI (language score of 77 or less) and those without, creating three groups: children with ASD and LI (ALI; N = 38), those with ASD and but no LI (ANL; N = 34) and those with LI but no ASD (SLI; N = 25).

Results: Results in preparation will address the following questions: How many children show delayed language milestones and how many show early language regression? How many children do not acquire functional language? What language level do verbal children achieve and how do their receptive and expressive abilities compare? How many children achieve language skills in the average range? How many children present with an SLI profile? Results will also be presented that compare ALI, SLI and ANL groups. Children with ALI do not show more autistic symptoms than those with ANL. In ALI the combination of ASD and language impairment is associated with weaker functional communication and more severe receptive language difficulties than those found in SLI. Receptive and expressive language, are equally impaired in ALI, whereas in SLI receptive language is relatively spared.

Conclusions: Results will be discussed in terms of different possible models of the association between ASD and LI.

Cues to word learning in Autistic Spectrum Disorders

Courtenay Frazier Norbury[1,2], Helen Griffiths[1], Kate Nation[1], Sara Hansford[2]
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Cognitive theories of autism predict difficulties in acquiring new words either because of (a) deficits in attending and/or processing social cues, or (b) deficits in using linguistic context to infer word meaning. We contrasted these two hypotheses in 13 children with autistic spectrum disorders, 13 children with language delay and 13 typically developing children (all aged seven years). Children saw three novel objects on a computer screen and were asked to click the photo that matched a spoken sentence. In the social cue condition, a woman standing behind the objects gazed at the target item. In the linguistic cue condition, information in the sentence biased a particular interpretation (i.e. stirred cues the only liquid item in the display). Immediately after the experiment and approximately four weeks later, we assessed word learning via word recognition, naming and definition tasks. In the recognition task, there was a significant interaction between cue type and group; typically developing controls were much more reliant on social cues to word learning than either of the other groups. With respect to naming, children with ASD recalled more phonological information about the new words than the other two groups regardless of cue type. All groups found it easier to encode semantic information in the social condition relative to the linguistic condition, even though semantic information was explicitly stated in the latter. Immediately following exposure, phonological short-term memory was a significant predictor of word learning across the groups, whereas the quality of semantic information encoded during that initial exposure was the best predictor of longer term learning. These findings highlight the complex relationships between social, conceptual and phonological skills as young children learn new words. Furthermore, they suggest that children with ASD might succeed in acquiring vocabulary by relying on intact phonological skills.

The use of linguistic context in autism

Kate Plaisted
University of Cambridge

People with autism show a wide range of linguistic difficulties, across the IQ range. A common difficulty is with the pragmatics of language (i.e. the intended meaning of an utterance which is not explicitly stated in the words). For example, children and adults with autism often show literal interpretations of others' speech and have difficulties in understanding jokes and metaphors. The difficulty with pragmatics may stem from a reduced sensitivity to linguistic context. Many contextual effects have been reported in the literature. For example, individuals with autism have been reported to have difficulty identifying the correct bridging inference when given two sentences in the form of a scenario and an outcome. Several studies have reported that individuals with autism tend to read homographs with their common pronunciation, regardless of preceding sentence context. It has been shown that adults with autism have difficulty interpreting ambiguous sentences compared to typical adults: when given a choice of between a common but incorrect interpretation and a rare but correct interpretation, individuals with autism were more likely to select the former. It has also been reported that children with autism show a tendency to complete sentence fragments inappropriately. For example, given the sentence fragment "The sea tasted of salt and …" children with autism tended to provide the common associate "pepper" rather than a word associated with the subject "sea".

However, there are other studies that show good use of contextual information, such as good use of preceding visual and verbal context information to facilitate object identification. These findings raise the possibility that other abnormalities besides poor processing of linguistic context may be responsible for some of the findings reported above. For example, individuals with autism may select common but incorrect interpretations as a consequence of an executive deficit in the inhibition of highly salient information. It is therefore important to establish whether individuals with autism do have deficits in processing sentence context in tasks that minimise task-specific demands, such as high executive load. Furthermore, it is also important to establish whether individuals with autism show contextual deficits in tasks that more closely resemble real-life demands of linguistic processing.

Two experiments will be presented to examine these issues. Both assess the use of context during on-line language processing in autism, using a word-monitoring procedure. The first experiment compares the use of semantic and syntactic context and found reduced facilitation by both in children with autism compared to typical children. The second experiment indicates that this was not simply due to general difficulties in word monitoring. The experiment assessed the impact of the relevance of preceding sentence context on word monitoring. Children with autism performed better than control children when preceding context was irrelevant and worse when relevant. The data from both experiments can be explained in several ways and suggest a number of avenues for further research concerning pragmatic deficits in autism.

Syntactic priming in children with ASD

Melissa Allen Preissler[1], Sarah Haywood[2], Holly Branigan[2], Gnanathusharan Rajendran[3]
[1]University of Lancaster [2]University of Edinburgh, [3]University of Strathclyde

Conversationalists often imitate each other's choice of syntactic structure. For example, hearing "the ball that is red" increases the likelihood that a speaker will choose "the monkey that is brown" over "the brown monkey" (Cleland & Pickering, 2003). Such syntactic priming effects are thought to be largely non-conscious, and tend to be stronger in children than adults (Branigan, McLean, & Jones, 2005). This has been taken as evidence that priming is a mechanism by which abstract syntax is acquired during normal language development, as well as "oiling the wheels" of successful conversation in older children and adults (Garrod & Pickering, 2004).

Children with Autism Spectrum Disorder (ASD) have difficulty with language acquisition and usage, and also with imitation. One possibility is that general imitation difficulties extend to the linguistic domain, and hence contribute to the language delays and difficulties characteristic of ASD. According to this hypothesis, children with ASD will not show a syntactic priming effect, which may help to explain later difficulty with reciprocal dialogue. If children with ASD *do* syntactically align themselves with others, this might represent a preserved ability to mirror sentence form that could be used therapeutically. A syntactic priming effect might also suggest that children with ASD have intact imitation abilities in a non-conscious domain.

Thirteen children diagnosed with ASD according to DSM-IV criteria were included in the study (mean CA: 10.4). Participants with ASD were matched to typically developing (TD) children on the basis of verbal mental age as assessed by the BPVS (mean VMA: 7.4); control data is still being collected.

The experimenter invited the participant to play a modified version of the card game 'Snap!' Players took turns describing picture cards that depict animals and characters involved in various transitive actions. If the cards matched, the first person to shout 'Snap!' won the round. Unknown to participants, the experimenter's card descriptions were scripted to include 12 active primes (e.g. 'the frog is tickling the fairy") and 12 passive primes (e.g. "the robber is being washed by the elephant"). The children's card descriptions were tape-recorded, transcribed verbatim, and coded as active, passive, or "other" (other responses were excluded from our analyses).

Children with ASD showed a reliable priming effect ($t1(12) = 3.53$, $p = .004$; $t2(23) = 5.21$, $p < .001$), producing more passive descriptions after hearing passive primes (27%) than after active primes (6%). The magnitude of this effect is consistent with results obtained from TD children. There was a negative correlation between verbal mental age and individual priming rates in the ASD group ($r=-.33$), suggesting that younger individuals tend to prime more than older ones, again concordant with results obtained with TD children. Our findings suggest that children with ASD are able to mimic the form of a sentence, and have abstract representations for a syntactic structure (the passive) that they may not spontaneously produce. Results will be discussed with respect to implications for language learning and dialogue processing in ASD.

The shape bias: Investigations of word learning with children with autism

Saime Tek, Gul Jaffery, Deborah Fein, Letitia Naigles
University of Connecticut

Research on the language outcomes of children with autism spectrum disorder (ASD), it has revealed that vocabulary growth is a strength (Tager-Flusberg, 1985; Fein et al., 1996); however, their lexical organization seems more impaired (Dunn et al., 1996, Kelley et al., 2006). How early in development is this division evident? In this study, we investigate the shape bias, which facilitates rapid word learning in young typically developing children. The shape bias is demonstrated when children map the referent of a novel word onto the shape of a novel object rather than its texture, color, or size (Smith, 2000). Because the emergence of the shape bias is proposed to rely on children's off-line lexical processes (Smith, 2000), we hypothesized that children with ASD might show some difficulty with this word learning bias.

In a longitudinal design, we tested 15 typically developing toddlers and 14 children with autism, at three time points (TYP: 20, 24, and 28 months; ASD: 33, 37, and 41 months). The groups had similar CDI production scores at Time 1 ($M = 66$ count nouns). The shape bias was tested via intermodal preferential looking (IPL): Five novel objects were presented, then each was followed by two alternatives; one alternative matched the original in shape while the other matched the original in color. During the first (No Name) presentation of each set, the baseline audio asked "which one looks the same?" During the second (Name) presentation, the original object was given a label (e.g., "dax") and the test audio asked "Find another dax." Children who looked longer at the shape match during the Name trials than during the NoName trials demonstrated a shape bias. Children's visual fixations were recorded and coded off-line; the dependent variable was the percent of looking to the matching object. Both groups were also given an analogous pointing task with the same (3-dimensional) stimuli.

No evidence of a shape bias emerged in either group at Time 1. The TYP children showed a shape bias at Time 2 ($F(1, 14) = 6.22$, $p < .05$, $?2 = .308$) and at Time 3 ($F(1, 14) = 15.28$, $p < .01$, $?2 = .522$) in the IPL task, and their performance reached significance at Time 3 for the pointing task ($t(14) = 2.14$, $p = .05$). The ASD children did not show a shape bias at any Time, despite a reported mean vocabulary of 120-150 count nouns at Times 2 and 3, respectively, and showing novel word learning abilities with other stimuli (Swensen et al., 2007).

Children's gaze shifts (the number of times they looked back and forth at the side-by-side stimuli) were also tabulated. Both groups tended to shift gaze more often during the NoName trials than the Name trials ($p<.08$). Thus, it appears that the ASD children were treating the visual stimuli similarly to the TYP children. However, our results revealed that children with autism had difficulty using the shape bias to learn new words. This difficulty may be an early indicator of their subsequent lexical/categorical difficulties.

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00
Symposium Number – S5-2

Chair: Geraldine Legendre, *Johns Hopkins University*
Discussant: Letitia Naigles, *University of Connecticut*

Early abstract knowledge of verbs and their morphosyntax

Description:
This symposium presents experimental evidence gathered from preferential tasks (Intermodal Preferential Looking Paradigm -IPLP, Hirsh-Pasek & Golinkoff, 1996- and Headturn Preference Procedure -HPP, Jusczyk & Aslin, 1995- with and without eye-tracking) probing children's sensitivity to grammatical syntactic patterns in their native language and their comprehension of morphosyntax. The results of these independent, cross-linguistic studies (English, French, and German) attest to the early abstract nature of the prerequisites for the acquisition of syntax. In addition, they reveal a pattern of acquisition of subject-verb number agreement which holds for both French and German whereby children demonstrate a sensitivity to discontinuous agreement dependencies significantly ahead of their comprehension of verbal inflection alone. The English dependency study in a domain other than subject-verb number agreement confirms that discontinuous dependencies are mastered at a very young age.

More specifically, the following evidence will be presented: (i) 15-month-olds also prefer matching a visually presented scene onto a grammatical dependency involving an auxiliary rather than an ungrammatical one involving a determiner despite equal overall lexical frequency of the auxiliary and the determiner in the language ('Bunny is eating' vs. '*Bunny the eating', see IPLP study); (ii) 24-month-old children acquiring French are sensitive to the dependency that is characteristic of subject-verb agreement in number with irregular verbs [ləgarsõdɔr]' 'the boy sleeps' vs. [legarsõdɔrm] 'the boys sleep'). However, contrary to 30-month olds, they cannot yet match visually presented scenes with sentences involving regular verbs that are solely distinguishable in terms of the distinct coda consonant of a clitic or prefix-like element, as in [ilariv] 'he arrives' vs. [izariv] 'they arrive' (see HPP study in comparison with earlier IPLP study); and (iii) 3-year-old children acquiring subject-verb agreement in German are able to match visually presented scenes with sentences that are solely distinguishable in terms of the verbal inflection consisting of a single final consonant [zifytərt] 'she feeds' vs. [zifytərn] einen Hund 'they feed a dog' (see study combining IPL with eye-tracking); in contrast, 18-to-24-month-olds show a sensitivity to grammatical discontinuous dependencies in the German agreement system.

The theoretical implications of these results will be discussed.

Toddlers' understanding of English discontinuous verbal dependencies

Sarah Pope, Amanda Seidl, George Hollich, Lisa Goffman, Rob Kail, Larry Leonard
Purdue University

Previous research has established that even very young infants are sensitive to both the segmental and suprasegmental acoustic properties of function morphemes (Gerken, Landau & Remez, 1990; Shi, Werker & Cutler, 2006) as well as their placement in sentences (Shady, 1996). In addition to this sensitivity to placement and the acoustic properties of function morphology, there is also some evidence from preferential looking studies that suggests function morphemes contained in sentences convey meaning to infants. For example, Hirsh-Pasek and Golinkoff (1996) showed that 17-month-olds can use word order to comprehend reversible sentences with familiar verbs and nouns while Seidl, Hollich & Jusczyk (2003) showed that 20-month-olds understand a variety of *wh*-questions also involving checking relations. In these studies, toddlers display an ability to comprehend complex grammar long before they can produce it, providing reason to expect that despite the syntactic complexity of discontinuous dependencies, it will be in place for the infant by 24 months and perhaps even at 15 months.

In this experiment we looked at the discontinuous encoding of imperfective aspect in English (is V-ing) in a preferential looking task to measure whether toddlers' processing of sentences was impeded by an ungrammatical dependency and aided by a grammatical one. The visual stimuli consisted of side-by-side videos of animal puppets performing two distinct actions. We used auditory stimuli with stressed target function words so that infants could not rely on purely acoustic information and could not easily ignore ungrammatical patterns. Specifically, we presented toddlers with grammatical sentences like "Bunny is eating" recorded using the tensed verb *get* for all sentences, e.g., "Bunny gets eating". We chose to use the verb *get* in this position so that formant transitions would not bias this listener towards hearing either *is* or *the* in this position. The function words '*is'* and '*the'* were recorded in isolation (and thus with word stress) with identical falling pitch contours and durations. The word *gets* was then spliced out of the carrier sentences and '*is'* and '*the'* were spliced in its place. We used *the,* for the ungrammatical dependency instead of another function word or a made-up word because *the,* like *is,* is an extremely high frequency word with which infants are familiar. By using these stimuli, we can draw conclusions based purely on toddler' sensitivity to grammaticality of a presentation sentence, rather than on effects of lexical familiarity.

Our findings indicate that both 15- and 24-month-olds successfully differentiated between sentences that used function words correctly and those that contained an incorrect word inserted in the same position. Specifically, when toddlers heard a correct sentence such as "Bunny is eating", they looked significantly longer at the video of the bunny eating than when they heard "Bunny the eating." This indicates that infants as early as 15 months are sensitive to the grammatical formation of sentences, and the absence of age differences suggests that 15-month-olds are as advanced in this sensitivity as older toddlers. This finding advances our knowledge of the extent of this sensitivity and expands the existing evidence of early use of morpho-syntactic structure in language comprehension.

The nature of first word combinations: Evidence from the sensitivity to subject-verb agreement in 24-month-olds acquiring French

Geraldine Legendre[1], Isabelle Barriere[2], Louise Goyet[3], Thierry Nazzi[3]
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Background and Aims: Previous studies on the acquisition of French have shown that: a) Clitic pronouns are best analyzed as subject-verb agreement markers (e.g. Pierce 1992); b) The productive use of non-3rd singular clitic pronouns emerges around 31 months of age, based on a longitudinal and a cross-sectional study of spontaneous production (Legendre et al 2002, Legendre 2006); c) 30-month-old children understand but do not produce all subject pronouns, according to parental reports (Legendre et al 2007); and d) The same 30-month-old children do match appropriate verbal and visual stimuli in both singular and plural conditions, according to the results of a study on regular verbs using the Intermodal Preferential Looking Paradigm IPLP (Legendre et al 2007). While these verbs are characterized by non-distinct 3rd person endings they undergo a morpho-phonological process (liaison) when their initial segment is a vowel with the consequence that number is registered on the coda of a prefix-like element (e.g. *il arrive* [ilariv] vs. *ils arrivent* [i(l)zariv] 'he vs. they arrive). Results obtained on 24-month-old children do not show evidence of their ability to match verbal stimuli to appropriate visual stimuli. Therefore, the abstract feature of number marking instantiated by prefix-like elements attached to regular verbs is in place in 30-month-old but possibly not in 24-month-old native French-speaking children. However, an analysis of child-directed speech reveals that children are rarely exposed to the singular/plural contrasts of vowel-initial verbs. Thus, to establish a) whether sensitivity to subject-verb agreement dependencies emerges before or at the same time as the comprehension of the abstract feature of 3rd person singular versus plural marking, and b) whether children pay differential attention to number contrasts marked by verb ending rather than a prefix-like contrast between two adjacent words- the clitic pronoun and the verb, it is necessary to compare the above results with those on subject-verb agreement with irregular French verbs relying on copying features of a DP onto the verb as in *le* [lə] *garçon dort* [dɔr]' 'the boy sleeps' vs. *les* [le] *garçons dorment* [dɔrm] 'the boys sleep'.

Methods: Data were obtained on sixteen 24-month-old children using the Headturn Preference Procedure (HPP). The stimuli consisted of 4 types of lists of 6 sentences: grammatical lists (noun-verb 3rd person agreement: 2 singular list vs. 2 plural list) and ungrammatical lists (non-verb 3rd person disagreement: 2 singular subjects/plural verbs vs. 2 plural subjects/singular verbs). All 12 verbs were frequent irregular verbs known to the children (according to parental reports) for which agreement is expressed with endings. Each child heard 4 lists including a grammatical set with singular DP subjects and an ungrammatical set with singular DP subjects involving the same verbs, a grammatical set with plural DP subjects involving different verbs and an ungrammatical set with plural subjects involving the same verbs. The order of presentation of the lists was randomized for each participant.

Results: A significant difference was obtained for the grammatical and ungrammatical lists, $t(15) = 2.40$, $p = .015$, children having longer orientation times to the grammatical lists (8.28 s) than to the ungrammatical lists (6.97 s). The occurrence of the same singular/plural contrasts in the input will be discussed.

Conclusions: The results of the HPP experiment support the conclusion that at an age when they tend not to productively use subject-verb agreement (24 months), children exposed to French are sensitive to the subject-verb agreement relation between the number of the DP marked on the definite article and the verb ending (ongoing experiments are evaluating 18-month-old children). Although our results suggest that sensitivity to subject-verb agreement seems to emerge earlier than comprehension of the same relation, it is unclear whether this order of acquisition is due to the different task demands or to the degree of difficulty inherent to the distinct sub-patterns of agreement marking in French. Theoretical implications of our experimental results and those of analyses of typical child-directed speech will be discussed focusing on the extent to which they provide evidence for an early abstract representation of subject-verb agreement.

Sensitivity to verb morphology by German toddlers: Evidence from eye-tracking

Oda-Christina Brandt, Barbara Hoehle
University of Potsdam

Backround and Aims: The acquisition of subject-verb-agreement and accordingly verb morphology is a fundamental aspect of the acquisition of German. German learners start to use finite verb forms within their 3rd year of life with almost errorless production from the outset. This leaves open the question of how and when children start to recognize the structural configuration necessary for correct subject-verb-agreement and the inflectional forms that mark this relation. To address this question we conducted a series of studies using the Headturn Preference Procedure (HPP). We tested German infants' (18–24 month) sensitivity to number agreement between subject and verb by presenting sentences with correct subject verb agreement and with agreement violations. In the agreeing passages, subject and verb were both marked for the same number, i.e. either singular or plural, whereas in the agreement violating passages, number forms of subject and verb were conflicting. Our experiments showed that children exhibit a clear preference for the agreeing passages only when the verb was marked for 3rd Person Singular. Thus it is unclear whether they actually prefer the passages because of agreement between the number of subject and verb or because of favoring the verbal singular ending '–t'. As these HPP-results cannot be considered conclusive, we conducted a new experiment combining the Intermodal Preferential Looking (IPL) Paradigm with the technique of automatic eye-tracking to test the children's ability to infer the correct number of the sentence subject from verb morphology alone. Applying the technique of automatic eye-tracking allows for very fine-grained spatial and temporal analyses of the children's eye gaze and was primarily chosen for technical reasons.

Method: In the experiment 18 German-speaking children (mean age: 3;9, age range: 3;2 – 4;2) were tested on 16 trials each. In each trial two pictures of scenes with either one or two girls performing an action were presented side by side on a monitor. The scenes were first presented in silence for 3 seconds (baseline phase), then a blank screen appeared while the children heard the auditory stimulus. Afterwards the pictures reappeared for 3 seconds (test phase). As auditory stimuli we used simple sentences. Each sentence consisted of a pronoun subject, a transitive verb (which was bi-syllabic in both number conditions) and an object. Using pronoun subjects, which are syncretic for the 3rd Person Singular female (*sie* 'she') and the 3rd Person Plural form (*sie* 'they'), allowed us to leave the verbal inflectional ending ('-t' for singular and '-n' for plural) as the only disambiguating cue between the sentences, e.g. *Sie füttert / füttern einen Hund* 'She is / they are feeding a dog'. The side of presentation of the correct picture was counterbalanced across trials and across children. Eye gaze was tracked and recorded with a Tobii eye-tracker (T1750).

Results: A significant interaction between phase (baseline vs. test), sentence condition (singular vs. plural-verb) and picture (singular vs. plural) was obtained, which reflects the fact that the children directed their eye gaze on the picture corresponding to the presented sentence. In the baseline phase, the children generally showed greater interest for the picture showing an action performed by two girls (plural picture). When a sentence containing a singular verb form was presented, they shifted their gaze towards the picture showing only one girl performing the same action (singular picture). This shift was not present when a sentence containing a plural verb form was presented.

Conclusions: Our results indicate that 3-year old German children are able to match sentences differing solely in the verbal inflection to a corresponding picture, i.e. that they parse the inflectional ending of the verb for the identification of the number of the sentence subject. This may be interpreted as evidence that German children employ the subject-verb-agreement relation for correct sentence interpretation. Having shown that our eye-tracking paradigm is feasible to investigate sentence comprehension in young children we are currently testing two-year-old children with the same experiment.

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00
Symposium Number – S5-3

Chair: Amanda Owen, *University of Iowa*
Discussant: Amanda Owen, *University of Iowa*

The role of input variability on language acquisition and use

Description:
Within the literature on category formation, the degree of variability present in stimuli has been shown to influence what individuals will accept as category members. Critical factors include the range of category members presented (Younger, 1985, 1990), the number of dimensions that must be represented (Bomba & Siqueland, 1983) and the number of times an individual item is shown (Quinn 1987). The distribution of the input also appears to influence factors that are relevant for language learning, at least for novel phoneme categories (Maye et al., 2002) and morphological relationships (Gomez, 2002). More recent experimental work in the area of lexical and syntactic development has shown that input that contains a mix of repeated and novel items (Casenhiser & Goldberg, 2005) and the order in which these various exemplars are presented (Gentner & Namy, 2006; Goldberg et al., 2007; Gentner et al., in press) influences the strength of initial acquisition and later extension of the category to new instances.

More limited work is available on how an individual's experiences interact with the input. However, there is some evidence available that individuals with language impairment are have a greater difficulty identifying patterns in visual learning tasks (Tomblin et al., submitted) and are more input dependant within verb learning tasks (Riches et al., 2006).

This symposium will examine the contributions of both the learner and the input structure to acquisition of various language domains. The first presentation will examine how the distribution of phonetic cues during familiarization influences the ability of infants to acquire lexical neighbors. The second presentation examines the way in which learner characteristics (high/low vocabulary) and training input influences immediate and later vocabulary acquisition. The third and fourth presentations also focus on learner characteristics, from the perspective of comparing typical individuals to individuals with language impairment. In one case, children are asked to learn a novel form-meaning pairing (novel construction) taught using 4 different verb type-token ratios. In the other case, adolescents participated in an artificial grammar learning task in which variability of the exemplars as manipulated.

In both studies, typical participants demonstrate the best learning in the high variability conditions, but the participants with language impairment have the weakest performance under the same conditions. The final paper proposes a method for examining acquisition of morpho-syntactic relationships through online measures. Computational modeling of acquisition of non-adjacent dependencies aligned well with adult RT performance on a comparable task, leading to an opportunity to further examine the role of variability in typical and language impaired populations.

Following the presentations, we will invite discussion on the interaction between the learner and the input and the role that different types of input structures might play on the acquisition process. Special emphasis will be placed on the way that learners might extract regularities from the input and means of facilitating that process for different populations of language learners.

Phonological variability and word learning: Infants can learn lexical neighbors

Gwyneth Rost[1], Bob McMurray[2,3]
[1]*University of Iowa,* [2] *Iowa Center for Development & Learning Sciences*

A central problem in speech perception is the challenge of identifying consistent abstract units like words across highly variable acoustic streams. This variability arises from different speakers and speaking rates, and even different instantiations of the same word. The infant must cut through this variability to acquire phonological contrasts – the speech cues that discriminate words.

Work on this presents a mystery. While infants can discriminate many contrasts by 12 months (Werker & Tees, 1984) they do not easily learn phonologically similar words such as "bih" and "dih" (Stager & Werker, 1997). Explanations for this focus on top-down factors such as task demands (Werker, Lloyd, Cohen, Casasola, & Stager, 1998) and lexical interference (Swingley & Aslin, 2004).

However, these studies do not address how infants come to learn such pairs. Bottom-up processing may be important, as infants use systematic variability in the speech signal to learn phoneme categories (e.g. Maye, Werker, & Gerken, 2002). Thus, we hypothesized that infants do not ignore phonetic variability when learning words but use it to define the acoustic characteristics of the words in a way that may augment learning.

We evaluated the use of acoustic variability in learning phonologically similar words in a series of experiments using the switch task (see Werker et al., 1998), a habituation-based measure. Results from sixteen 14 month-olds are reported for each experiment.

Experiment 1 replicated Werker et al. (1998) using a single exemplar of the words /buk/ ("buke") and /puk/ ("pook"). As expected, infants failed to learn the words ($p=.84$).

Experiment 2 used a multiple-exemplar habituation in which infants heard up to 54 different exemplars (three each from 18 different speakers) of each word. Infants in this experiment learned the words ($p=.01$). Thus, acoustic, rather than lexical, factors may explain prior failures to learn words: in particular, the lack of variability in prior experiments.

The set of exemplars in Experiment 2 contained multiple sources of variability, both criterial (i.e. voicing, the acoustic dimension on which /b/ and /p/ vary) and non-criterial (speaker, pitch). Experiment 3 examined the role of criterial variability – the phonetic cue of voice-onset time (VOT) – using a /buk/-/puk/ continuum that varied only in VOT (from -40 to 100 ms). During habituation, words were presented in a bimodal frequency distribution (Maye, et al., 2002) to provide appropriate variability. Infants did not demonstrate learning ($p=.98$). A follow-up experiment manipulated two additional phonetic cues to voicing, yet still yielded no learning ($p=.43$). Thus, variation in criterial cues alone is not sufficient for word learning. Ongoing work is testing this specifically, using words that vary in non-criterial features (pitch, speaker) but not on the phonetic cue (VOT).

Infants learn lexical neighbors given a variable set of exemplars. Since variation adds task demands (e.g. speaker normalization) without altering top-down factors, phonological development must contribute to word learning. However, these results demonstrate that phonetic variation (in this case VOT) is not sufficient for learning phonologically similar words, suggesting a new role for non-criterial acoustic variation in phonological development.

Input variability and the Shape Bias: It matters what statistics you get and when you get them

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A young child shown a novel solid object and told a novel name will most likely say that only other things that are the same shape as the named exemplar can be called by the same name. This "shape bias" would be useful for learning many of the nouns in the early noun vocabulary; Samuelson and Smith (1999) found that the set of 312 English nouns children learn first is dominated by names for solid objects and names for categories organized by similarity in shape. Further, there is a tight correlation between these sets such that the majority of nouns learned early name solid things in shape-based categories. Previous research suggests that the development of the shape bias may be the result of learning this kind of vocabulary. This finding fits with cross-linguistic research suggests that children learning languages with other correspondences between category organization and nominal categories develop biases that fit the specific relationships found in the language they are learning. The current work seeks further insight into the relationship between the statistics of the early noun vocabulary and the development of the shape bias by examining the role of variability in the statistics and timing of input on children's developing biases.

Forty-two 15- 21-month-old children were tested in a longitudinal noun training study. One group of children was taught a set of names dominated by solid objects and categories organized by similarity in shape, but in which these groups were not correlated (Shape Dominated condition). A second group of children was taught a vocabulary that contained equal numbers of names for solid and nonsolid things and categories organized by shape and material, but also contained a tight correlation between solidity and category organization (Shape Correlated condition). A third group of children was taught a vocabulary in which all the names were for nonsolid things in categories organized by similarity in material substance (Material Control). We examined variability in the timing of the input by including children with a range of starting vocabularies, thus allowing us to probe the influence of the new vocabulary statistics at different points in vocabulary development.

The data replicate prior findings by demonstrating the development of a precocious shape bias with solid stimuli in both the shape dominated and shape correlated conditions. The data also suggest that variability in the specifics of the input statistics as well as variability in the timing of the introduction of those statistics are critical to the development of the shape bias. In particular, children who started with a smaller vocabulary and were taught statistics that fit the bias towards shape in the developing vocabulary (Shape Dominated or Shape Correlated conditions) demonstrated a precocious shape bias and showed an acceleration in subsequent vocabulary development. In contrast, children with larger starting vocabularies who were taught statistics that did not fit those in the developing vocabulary (Material Control) did not demonstrate a precocious bias or show an acceleration in vocabulary development.

The role of input frequency on children's acquisition of a novel construction: Differences between typically developing children and children with language impairment

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Children with specific language impairment (SLI) have difficulty acquiring language in the absence of obvious causal factors (Tomblin, Records, Buckwalter, Zhang, & O'Brien, 1997). These children exhibit a general language delay, with particular impairment in the area of grammar, and show subtle signs of other cognitive difficulties (Leonard, 1998). We explored these deficits in the context of the usage-based account, which relies on general cognitive mechanisms to explain language acquisition (Tomasello, 2003). Specifically, it claims that word order, morphemes, and lexical items independently contribute meaning to a proposition, and are learned through the processes of mapping, schematization and analogical reasoning (Tomasello, 2003; Goldberg 1995, 2006). Children first map meaning onto a particular construction, and later generalize these meanings to new instances. Both observational and experimental work has shown that typically developing children learn syntactic constructions better when trained with a prototype verb and a few extension examples. (Casenhiser & Goldberg, 2005; Goldberg, Casenhiser, & Sethuraman, 2004).

We hypothesized that children with SLI might have difficulty either with the initial mapping of the construction or with generalization of the construction to new instances. To test this hypothesis we examined the role of input frequency on children's acquisition of syntax in a novel construction learning task (Casenhiser & Goldberg, 2005). Eight children with SLI and 14 typically developing (TD) children, (ages 5-9) were taught 4 novel grammatical constructions (V-O-S [Verb Object Subject]; V-S-O; S-O-V; O-S-V), each associated with a novel meaning (e.g. *sudden appearance, tight fit*). Critically, the nonsense verbs used in the constructions were presented in one of four token ratios: balanced (4-4-4-4), unbalanced (10-2-2-2) , extreme skew (13-1-1-1), and generalized (6-2-2-2-2-2). The word orders, meanings and input structures were counterbalanced, ensuring that effects are attributable to input structure alone. On each visit, the child took a 9 item pretest (presented with speech filtered to be unintelligible), watched 2 rounds of 16 training videos in which a meaning and construction were paired, and then took a 9 item posttest (6 previously unheard novel verbs; 3 filler items).

Within this data set, we found that TD children performed better than children with SLI ($p<.001$). A main effect for skew type ($p<.05$), was mitigated by a group by skew interaction. Posthoc testing showed that TD children benefited most from the generalization condition ($p<.05$), whereas children with SLI showed little (or even negative) learning. Our results for TD children are consistent with previous findings, in that a prototypical verb helped children map a meaning onto a form and then generalize that mapping to novel verbs. Greater variability in the verb exemplars that the child heard facilitated learning. Further investigation is necessary to determine what information the children with SLI were extracting from the training sessions. Although it is clear that these children did not extend the construction to new meanings, we cannot determine if they mapped the construction containing the trained verbs. The results will be discussed with regard to the degree and type of variability that facilitates learning for each group of children.

The effect of variability in learning nonadjacent dependencies in typically-developing individuals and individuals with language impairments

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Nonadjacent dependencies characterize several aspects of English grammar, including subject-verb agreement and certain verb tense structures. Recent studies using artificial grammar have shown that high variability of intervening elements would facilitate learning of dependent relationship of nonadjacent linguistic items (Gómez, 2002; Onnis, Christiansen, and Chater, 2004). In English, children with language impairment have particular difficulty in learning grammatical morphology (Leonard, 1998). One interpretation of the language learning problem is difficulty in statistical learning of nonadjacent dependencies. Specifically, we were were interested in examining whether high variability would facilitate learning these relationships in these children as in typically-developing individuals.

Participants & Methods: Sixty 14-year-old adolescents with language impairments (LI) and 60 age-matched adolescents with normal language (NL) were recruited from a larger cohort of individuals participating in a longitudinal study of SLI (Tomblin et al., 1997). The task developed by Gómez (2002) was used in this study. Participants listened to auditory strings consisting of three sets of nonadjacent dependencies (*aXd, bXe, and cXf*) under one of three conditions: low variability (*X*= 2 different words), mid variability (*X*= 12 different words), and high variability (*X* =24 different words). Following the exposure phase, participants judged the grammaticality of 12 test strings, 6 of which were grammatical (e.g., a*X*d) and the other 6 were not (e.g., a*X*f).

Results: The mean accuracy was entered into a 2 (Group) x 3 (Variability) ANOVA. The main effect of variability conditions did not reach significance, partially due to a trend of opposite learning patterns between the LI and the NL groups across the three conditions. A significant main effect of group, F (1,114) = 6.35, p = .01, η^2 = .05, favoring the NL group was found, indicating overall better performance of the participants in the NL group. The Group x Variability interaction did not reach significance. Because interactions require large sample sizes, this interaction was tested using three planned comparisons between the two groups at each of the three variability conditions. These contrasts showed that the groups were not significantly different in the variability 2 and 12 conditions. A significant difference, $t_{(25)}$ = 2.55, p < .05, favoring the NL group was obtained at the 24 word variability condition. The results suggest facilitation effects of high variability in detecting and learning structural dependencies of nonadjacent relationship for learners with normal language ability but less of an effect of variability for the SLI learners.

Individual's performance was further compared against a chance level rate. The NL group showed significantly above chance level learning in all three conditions. For the LI group, however, only performance in the low variability condition exceeded chance level. Together, the findings indicate a possibility that the participants in the LI group might have primarily relied on token frequency such that learning effects were shown when token frequency was relatively high (X = 2). In contrast, when token frequency decreased as a results of increasing number of different intervening tokens (X = 24), token frequency alone was not sufficiently efficient cue for learning nonadjacent dependencies.

Clicking a high-variability path to language learning: Tracing the trajectory of nonadjacent dependency learning

Jennifer Misyak, Morten Christiansen
Cornell University

Nonadjacent dependencies are abundant in language, e.g., in English subject-noun/verb agreement. High variability of intervening items has been shown to be important for learning such nonadjacencies in artificial language learning studies with both adults and infants (Gómez, 2002). Children with specific language impairment appear to be unable to use variability for learning nonadjacencies (Shu et al., 2006). While these studies suggest that variability may be crucial for learning nonadjacent dependencies in natural language, the temporal dynamics and precise mechanisms underlying learning are yet unknown. We therefore introduce a novel paradigm for the study of nonadjacency learning as it unfolds over time, along with simulations from a connectionist model capturing key aspects of the human data.

We incorporated Gómez's (2002) artificial nonadjacency language within a two-choice serial reaction-time task, resulting in continuous, indirect performance measures throughout participants' training. Thirty adults heard strings from the language while watching a grid display containing "targets" (written nonwords corresponding to those composing the auditory string for a trial) and "foils" (distractor nonwords used in other trial strings). Participants used a computer mouse to click on targets as soon as each was heard/anticipated. Participants received seven blocks of grammatical trials, with one ungrammatical block interposed before the last block. Finally, a prediction task was administered wherein trials proceeded as before, but with sounds corresponding to string-final (grammatically predictive) nonwords suppressed as participants selected endings from among two choices (i.e., target and foil). Reaction times (RTs) for predictive string-final nonwords were subtracted from RTs for nonpredictive string-initial nonwords on each trial to yield a mean RT difference score per block. Mean RT differences across blocks suggested an emerging sensitivity to the grammar, with notable performance decrements in the ungrammatical block relative to both preceding and succeeding grammatical blocks (p=.04; p=.003). The average accuracy score for completing string-endings in the prediction task was significantly above chance and indicative of learning (M=61.1%, p=.008) with considerable interindividual variation (SD=21.4%).

We conducted computational simulations using thirty simple recurrent networks (SRNs) trained on the same randomly-presented stimuli as humans, with the same progression of grammatical-ungrammatical blocks and prediction task, and with exactly equivalent exposure to the language. We assessed networks' performances in a qualitatively similar manner to humans, mapping SRN output onto the experimentally observed RT differences. Similar to the human results, the networks' performance in the ungrammatical block

dipped relative to the surrounding grammatical blocks (p=.0001; p<.0001). Mean SRN accuracy on the prediction task was significantly above chance (M=56.4%, p=.014), with an identical range (25-100%) to humans and a distribution not statistically different from humans' (p>.30).

Both human and SRN performance indicates that, on average, sensitivity to nonadjacent dependencies does not emerge until the fourth training block, with different nonadjacency types learned at different times. The close correspondence in human-model performance supports the efficacy of simple associative learning mechanisms for tracking nonadjacent, high-variability structure. Moreover, as task demands are modest, the paradigm may be extended to uncover the fine-grained, on-line nonadjacent dependency learning in children and language-impaired populations.

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00
Symposium Number – S5-4

Chair: Jean-Pierre Chevrot, *Laboratoire Lidilem*
Discussant: Elsa Spinelli, *UMR Psychologie et NeuroCognition*

Liaison acquisition and construction in French: Empirical tests for a usage-based model

Description:
The liaison in French is one of the sandhi phenomena that are present in many languages. In the field of linguistics, liaison is an unavoidable test for theories of adult phonology. More precisely, it is interpreted as an indicator of interactions between the various levels of language organization (phonology, morphology, syntax, lexicon, sociolinguistic variation). Our work examines the same issue while adopting a developmental perspective within the framework of the usage-based theories (UBT) (Bybee, 2001; Tomasello, 2003).

Several experiments and corpus studies involving children aged 2-6 years have provided evidence for a developmental scenario which interrelates a number of different issues: the acquisition of phonological alternations, the segmentation of new words, the formation of item-based constructions. According to this scenario, children favour the presence of initial CV syllables when segmenting stored chunks of speech of the type word1-liaison-word2 (les arbres 'the trees' is segmented as /le/ + /zarbr/). They cope with the variation of the liaison in the input by memorizing multiple exemplars of the same word2 (/zarbr/, /narbr/). They learn the correct relations between the word1s and the word2 exemplars through exposure to the well-formed sequence (un + /narbr/, deux + /zarbr/). They generalize the relation between a word1 and a class of word2 exemplars beginning with a specific liaison consonant by integrating this information into a specific item-based schema (e.g. un + /nX/, deux + /zX/). This model is based on three assumptions: (1) the segmentation of new words and the development of syntactic schemas are two aspects of the same process; (2) children generalize schemas and segment lexical items on the basis of memorized word1-word2 sequences (3) the more one type of sequence is encountered, the more opportunity children have to generalize the corresponding schemata.

The proposed symposium is structured in four parts.
- In the introductory speech, we highlight the heuristic qualities of liaison for the study of language acquisition. We explain why these qualities are favourable for the test of the UBT assumptions: (1) Liaison is frequent in the input (one liaison every 16 words) and it acts as a strong indicator of the frequency effect. (2) The functioning of liaison implies several levels of language organization and the notion of construction (Golberg, 2003) is favourable to this integration. (3) Liaison errors are frequent in French-speaking children and they act as an indicator of children's attempts to segment chunks of speech.
- The first paper has two objectives: (1) to present the model of pronominal liaison acquisition that we have developed within the UBT framework; (2) to summarize the data supporting this model.
- The second paper tests whether the usage-based model can account for the acquisition of obligatory liaisons as well as the acquisition of optional liaison which is a sociolinguistic variable in a Labovian sense. This issue raises the question of how UBT can act as a bridge between psycholinguistics and sociolinguistics.
- Given that the model is exclusively founded on experiments inducing the production of liaisons in determiner-noun sequences, the third paper test its ability to account for the acquisition of the second main type of obligatory liaison: the liaison between clitic and verb. The central hypothesis is that the statistical and distributional properties of these sequences leave the frequent clitic-verb sequences unsegmented.

Acquisition of liaison between determiner and noun: A usage-based model
Céline Dugua
Laboratoire CORAL

This paper has two objectives: (1) to present the model of prenominal liaison acquisition that we have developed within the framework of the usage-based theories; (2) to summarize the data supporting this model.

As a reminder, a liaison involves the presence of two words (Word1 and Word2) linked by a consonant (liaison consonant: LC), the phonetic nature of which depends on the Word1: /n/ after *un* ('a/one'), /z/ after *les* ('the' + plural), etc. Moreover, in a liaison context, the syllabic boundary no longer corresponds to the lexical boundary (the syllabification of *petit âne* ('little donkey') is /pti.tan/). In line with the usage-based theories, we assume that children memorize chunks of speech (Tomasello, 2003) some of which contain determiner-noun sequences including a liaison. The segmentation of such chunks forms the object of the two-stage model that we propose.

In the first stage, children segment lexical exemplars of each Word2. Given that they favour initial CV syllables, they attach the LC's to the Words2, thus resulting in several exemplars of each word: /nurs/, /turs/, /zurs/ for *ours* 'bear'. The segmentation of the Word2 is correlative with the segmentation of the Word1 which constitutes the stable lexical item in a large number of chunks. The determiner could therefore become the concrete element in schemata taking the form *un* + X, *les* + X, etc. The formation of these schemata results from the connection between chunks containing the Word1 (the determiner). In the slot X, children insert segmented variants of the Word2s. A summary of the evidence for this stage drawn from two experiments will be presented: a priming experiment inducing liaison errors and an "imperative task" experiment designed to prompt the production of Words2 without a Word1.

The second stage is characterized by a more abstract structure which generalizes the relation between a specific Word1 and a class of variants of the Word2s. From determiner + noun sequences including a liaison (/lezurs/, /lezan/, /lezami/, 'the bears', 'the donkeys', 'the friends'), children generalize specific schemata (*les* + /zX/) that include information about the liaison. More precisely, these schemata specify the nature of the lexical variant which should include the slot following a specific Word1 (in the case of *les* + /zX/: an exemplar starting with /z/ should follow the Word1 *les*). These schemata enable children to produce correct liaisons which they have never heard. However, these schemata cause regularization errors on words starting with a consonant (*un nèbre* instead of the expected *un zèbre* 'a zebra', *deux zuages* instead of *deux nuages* 'two clouds'). We will summarize the results of three experiments supporting this view. These involve a production task, a judgement of acceptability task designed to explore the regularization errors and the way they change with age, and a pseudonoun segmentation task involving determiner-noun liaisons which was designed to explore the segmentation process from 2;0 to 6;0.

In the case of the pronominal liaisons, the various schemata prefigure the internal structure of the noun phrase and would seem to belong to the general class of item-based constructions which are characteristic of early syntactic development.

Can the usage-based model of liaison acquisition account for the social differences which appear (and sometimes disappear) between 2 and 6 years of age? The case of obligatory and optional liaisons

Aurélie Nardy, Stéphanie Barbu
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Our aim was to test whether the usage-based model of liaison acquisition can account for the acquisition of categorical phonological alternation (through obligatory liaisons) as well as the acquisition of sociolinguistic variables (through optional liaisons). Optional liaison is a sociolinguistic variable in a Labovian sense: it is produced more frequently by educated adults. The obligatory liaison is not affected by such characteristics: all adult speakers realize it categorically (100 %) in the contexts where it appears.

One hundred and eighty-five native French children (93 girls and 92 boys), aged between 2;3 and 6;0 and divided into four age ranges, participated in the experiment. They were chosen on the basis of both parents' occupations in order to place them on a binary social scale: upper-class *versus* lower-class. To get the children to produce obligatory and optional liaisons in word1-word2 sequences, a picture naming task was designed. For each type of liaison, we examined the evolution of the three kinds of productions: the correctly produced liaisons (liaison produced with the appropriate liaison consonant (*des ours* produced [dezurs]), the non-production of the liaison (*des ours* produced [deurs] without [z]) and the replacement errors (liaison produced with an inappropriate consonant, e.g. *des ours* produced [denurs]).

For the obligatory liaisons, we observed numerous replacement errors in the younger children's productions. This result is congruent with the first stage of the usage-based model in which the production schemata of the type *des* + X do not specify which variant is entered in slot X. During the course of development, these errors tend to disappear to be replaced by correctly produced liaisons because of their reinforcement in the input. The disappearance of the errors corresponds to the second stage of the model in which the emergent schemata specify the exemplar's word form following the determiner (*des* + /*zX*/). We also observed early social differences in the children's liaison performances which we attribute to differences in the quantity of the input (Hoff, 2002, 2003). The lower-class children therefore catch up during the course of development as a result of the cumulative effect of the input.

In the case of optional liaisons, two variants are heard in the input: realized and non-realized liaisons. In line with the corpus studies of optional liaisons in adult, we assume that the lower-class children hear non-realized liaisons more frequently. The results show that all the children, whatever their social background, produce a majority of replacement errors at an early age and that these errors gradually disappear. The non-realizations increase more sharply in the lower-class children. Early social differences are observed in correctly realized liaison and – unlike the obligatory liaisons – this difference increases during development. Thus, all the variants which are present in the input increase but the rate of the increase depends on their frequency of use in the different social groups, whereas variants which are not present in the input tend to disappear in all children.

This pattern of results will be interpreted in the framework of the usage-based model which assumes that: (1) children generalize schemas on the basis of memorized word1-word2 sequences which they encounter in the input and (2) the more one type of sequence (with or without liaison) is encountered, the more opportunity children have to generalize their production schemata in order to produce the corresponding variants.

Acquisition of liaison: The test of the clitic-verb sequences

Sophie Gallot[1,2], Elsa Spinelli[1], Jean-Pierre Chevrot[2]
[1]*UMR Psychologie et NeuroCognition,* [2]*Laboratoire Lidilem*

Young French children often make liaison errors such as "des nanes" [denan] 'donkeys': the /n/ liaison is incorrectly inserted between the right-hand word (word1) and the left-hand word (word2) instead of the expected /z/ liaison. Replacement errors such as [denan] are accounted for in terms of the insertion of the exemplar /nan/ in the first-stage schema "des+X" of the usage-based model of liaison acquisition proposed by Chevrot, Dugua & Fayol (submitted).

Evidence for this model has been gathered from experiments based exclusively on the production of noun phrases including an obligatory liaison following a determiner. However, corpus studies (Chevrot, Chabanal & Dugua, 2007) show that children more frequently accomplish the obligatory liaisons between clitic and verb (e.g., the /z/ liaison in *ils ont*, 'they have') correctly than they do the liaisons between determiner and noun. Moreover, a correlation has been observed between the rate of correct liaisons after words1 and the restriction of the distributional possibilities to the right of them. Given that clitics are less numerous than determiners and more constrained as for word2s' inventory, it is possible that clitic-verb sequences form more cohesive units than determiner-noun sequences. As a consequence, frequent clitic-verb sequences should be unsegmented with the result that fewer omission and replacement errors should be made on the liaisons in these sequences than in determiner-noun sequences.

In order to examine this hypothesis, we designed an elicitation task in which 126 children (aged from1;9 to 6;11) were prompted to produce two types of sequences: (1) clitic-verb sequences requiring an obligatory liaison (e.g. *ils arrivent* /ilzariv/ 'they are coming'; (2) NP-verb sequences, where no liaison is required (e.g. *Les garçons arrivent*, 'the boys are coming'). Our predictions were the following: (1) we expected higher rates of correct liaisons (and thus lower rates of errors) in clitic-verb sequences than in the determiner-noun sequences observed by Dugua (2006) in an elicitation task involving 200 children aged from 2;0 to 6;0; (2) If the frequent clitic-verb sequences form unsegmented chunks, we expected to observe frequent inclusion of these chunks in the NP-verb condition, thus leading to the left-hand detachment of the subject ("les garcons ils arrosent" (the boys, they are watering); (3) we expected liaison adjunction errors in the NP-verb sequences (*Les garçons z-arrivent*, [legarsɔ̃zariv]). In effect, in order to produce such sequences without left-hand detachment of the subject, children have to retrieve the verb form from the memorized clitic-verb sequences. Given that they favour CV-initial syllables (Chevrot, Fayol & Dugua, submitted), they should insert the verb form [zariv] after the NP.

These results will be interpreted in the light of a statistical analysis of the distributional properties of clitics and determiners in French. Consequences will be adduced concerning the ability of the usage-based model to account for the acquisition of different types of obligatory liaison.

Symposium Session 5 - Wednesday 30 July 09.00 - 11.00
Symposium Number – S5-5

Chair: Anna Theakston, *University of Manchester*
Discussant: Elena Lieven, *Max Planck Institute for Evolutionary Anthropology*

Constructivist approaches to children's errors

Description:
A key test for any theory of language acquisition is whether it can successfully predict the error patterns found in children's production data. This symposium explores a number of well attested errors in children's language from a constructivist perspective. The papers

investigate whether this approach can account for children's errors in a principled way, by assuming that acquisition is driven by probabilistic learning from the input, with respect to patterns of omission error, and in the extraction of individual exemplars, productive frames, and phonological schemas. However, they also highlight important limitations in our understanding of exactly how children acquire more abstract linguistic representations.

The first paper investigates why children omit utterance-internal elements in their early multiword utterances. Using a computational model of language learning, they show that it is possible to produce output that closely resembles the patterning of omission errors in children's utterances, through the interaction between a distributional analyser that learns from input in the form of syllabified child-directed-speech and a trochaic bias in production.

The second paper explores an input-driven explanation for children's accusative-for-nominative case errors (me do it). In two studies they show that children are more likely to make errors with verbs they have heard modelled in complex sentences (Let me do it). However, some children generalise beyond the verbs modelled in this form in the input suggesting that a process of abstraction is involved, resulting in productive exemplar-based frames (Me+V).

The third paper focuses on children's errors in wh-questions, arguing that the frequency of particular lexical frames in the input should determine which questions will be error-prone. In three studies, they demonstrate that English- and German-speaking children are more likely to produce correct questions when they can base their questions around high frequency frames. However, negative questions are particularly problematic, and there is evidence that some children possess the ability to generalise knowledge between constructions by age 3.

The fourth paper explores the role of lexical frames in the acquisition of wh-questions with long-distance-dependencies (LDDs). Traditionally LDDs were thought to require complex and highly abstract knowledge for correct production. The presenter demonstrates that children's ability to produce complex questions correctly is affected by their prototypicality, even when other complexity factors are controlled. These data suggest that exemplar-based learning can explain the acquisition of both simple and complex sentences.

The final paper investigates which factors affect children's production of past-tense overregularization (OR) errors (comed). They test the claim that girls produce more OR errors than boys, due to differences in declarative vs. procedural memory systems. Their data provide no support for differences in OR rates based on sex or declarative memory abilities. Instead, the phonological properties of the verbs concerned determine OR rates, consistent with a constructivist schema-based approach.

The discussant, will consider these results with respect to constructivist theories of language acquisition.

Simulating sentence-internal omission errors in MOSAIC using a syllable-based representation

Daniel Freudenthal[1], Julian Pine[1], Fernand Gobet[2]
[1]University of Liverpool, [2]Brunel University

MOSAIC (Model of Syntax Acquisition in Children) is a computational model of language learning that takes child-directed speech as input and produces as output progressively longer utterances that can be compared with those of children at particular points in development. As a result of these characteristics MOSAIC can be used to simulate both the kind of errors that children make in their early multi-word speech and developmental changes in the patterning of these errors.

Previous work with MOSAIC has shown that it is possible to closely simulate developmental changes in the rate at which children make optional infinitive errors in four different languages (English, Dutch, German and Spanish) through learning anchored at the right edge of the utterance. However, MOSAIC currently learns from utterances represented as strings of words and this places limits on the kind of errors and the kind of languages that the model is able to simulate. Thus MOSAIC is currently unable to simulate child utterances with multiple sentence-internal omissions or to simulate patterns of error in highly agglutinative languages.

One way of moving below the level of the word is to use a syllabified dictionary to convert orthographically transcribed language into sequences of stressed and unstressed syllables. This kind of approach has the advantage that it allows one to use prosodic information to simulate the pattern of omission errors in children's speech. For example, Gerken (1991) shows that English-speaking children's omission errors tend to reflect the dropping of unstressed syllables, particularly when these syllables do not belong to a trochaic foot.

In this talk we present simulations of English that use a syllabified dictionary to convert orthographically transcribed language into sequences of stressed and unstressed syllables. The prosodic information in these sequences is used to implement Gerken's (1991) metrical account of the omission of function words in child speech. In the simulations the prosodic contour (in terms of metrical feet) of utterances produced by MOSAIC is estimated by replacing words with their prosodic patterns as defined in their dictionary entry. Next, unstressed elements are probabilistically omitted from the utterance with the omission probability being determined by whether or not the element is footed. It is shown that this prosody-based omission mechanism is successful in increasing the child-likeness of MOSAIC's output in that it allows MOSAIC to produce utterances with multiple sentence-internal omissions. It also brings the pattern of determiner omission that MOSAIC displays more in line with that evident in children. These results show that information represented at the syllable level can be a valuable addition to models that use whole word representation. Future work will investigate the potential of using a syllable-based representation to extend the range of languages that MOSAIC can simulate.

The role of the input in explaining English-speaking children's pronominal case errors

Minna Kirjavainen, Anna Theakston
University of Manchester

It is well known that many English-speaking two- to three-year-old children make pronoun case errors producing utterances such as *me do it, her going*, *him was crying* where accusative (ACC) pronouns are used in nominative (NOM) contexts (Rispoli, 1998; Budwig, 1989, Schütze & Wexler, 1996, Pine, Rowland, Lieven & Theakston, 2005). Explanations for the pattern of case errors observed in children's speech have been suggested by researchers from a range of theoretical perspectives. According to the Agreement-Tense Omission Model (ATOM, Wexler, 1998), case errors occur when children fail to check both tense (TNS) and agreement (AGR) in their utterances. In contrast, Rispoli's (1994; 1998; 1999; 2005) *paradigm building* model attempts to explain children's pronoun case errors in terms of the relative ease of retrieval of the various case forms.

In the current paper, we report two studies that investigate a third possible explanation for children's ACC-for-NOM pronoun case errors; the presence of complex sentences (*Let me do it, Watch him jumping*) in the input. In study 1, longitudinal naturalistic data from 17 English-speaking two-to-four-year-olds was searched for first person singular (1psg) ACC-for-NOM case errors and for all 1psg preverbal pronominal contexts. Their caregivers' data was also searched for 1psg pronominal contexts. The data show that the children's proportional use of me-for-I errors correlated with their caregivers' proportional use of *me* in 1psg preverbal contexts. Furthermore, the verbs that children produced in me-error utterances appeared in complex sentences containing *me* in the input significantly more often than verbs that did not appear in me-for-I errors in the children's speech.

In study 2, 20 2-yr-olds and 20 3-yr-olds took part in a repetition study. Children were exposed to sentences containing low frequency transitive verbs corresponding to pictures. Some verbs were modelled with pronominal complement-clause subjects and NP objects in the frame *Watch me/him/her V Bear*, others with NP complement-clause subjects and pronominal objects, e.g. *Watch Dog V me/him/her*. A toy animal then guessed what was happening in a new set of pictures, but produced case errors in his guesses, for example, *Um, now me V Duck*. Children had to tell E what the toy had said so she could write it down. The proportion of case errors in

the children's repetitions was calculated, comparing verbs which were modelled in complex sentences with pronominal subjects with those that took NP subjects. Preliminary results indicate that the children were more likely to produce case errors with verbs that were modelled in *watch-me/him/her-V-NP* constructions, and that there may be interesting differences in error rates between 1psg, 3psg masculine and 3psg feminine forms.

These findings will be discussed in the context of theories of early language development.

Testing an exemplar-based theory of question acquisition

Sarah Fletcher, Caroline Rowland, Ben Ambridge
University of Liverpool

A key aspect of successful theories of language acquisition is an ability to predict why errors occur in child speech and why some utterances seem to be protected from error. A recent exemplar-based theory (e.g. Rowland; 2007; Dabrowska, 2000) addresses this problem in question acquisition by proposing that children produce correct questions by learning and applying productive item-based frames (e.g. *what does* + X; where X represents variable subject and non-finite verb forms), with errors occurring only when they have yet to acquire the appropriate frame.

We present three studies that test whether we can attribute item-based frames to children in a principled way and then use these frames to predict error. The first study investigated the effects of adult modelling of particular wh-word+ auxiliary frames on children's production of grammatically correct wh-questions. Sixty 3-year old children were told a story and then requested to ask a toy talking dog questions about the story. The children were assigned to one of four conditions; two where the auxiliary (either is or should) was modelled in inverted form by the experimenter (is Wug and should Wug) and two with declarative models with embedded wh-question prompts, Wug is and Wug should. The results demonstrated that 3-year-old children were able to produce correct "what is" questions even in the absence of modelling, but could not formulate correct "what should" unless they had previously heard them modelled in wh-question form. These results suggest that the children may have construction-specific knowledge for some auxiliaries (e.g. should) but construction-general knowledge for others (is).

The second study investigated the effect of a child's prior knowledge of particular wh-word+auxiliary frames on doubling errors in wh-questions. Using a similar method to study 1, positive and negative wh-questions were elicited from 34 3-year old children. The results showed that the frames that we could attribute to children on the basis of their positive questions predicted the patterning of doubling errors (e.g. *what can he can't do?*) with negative questions. However, negative questions attracted a greater number of doubling errors than we would predict on the basis of frame frequency alone, contrary to the exemplar-based theory's strongest predictions.

In the third study we present results from a study on German wh-questions, which tests whether German children make more errors on low frequency frames than high frequency frames, as predicted by the exemplar-based theory. Preliminary results show that German children may show more ability to generalise than English children. Overall the results of the three studies provide good support for the idea that many of children's early questions are based on lexical frames. However, they also suggest that by age 3 years, children show some ability to generalise across different question types. This suggests a more sophisticated knowledge of question formation than can be captured by positing just the use of lexical frames.

Errors in questions with long-distance dependencies

Ewa Dabrowska
University of Sheffield

The ability to produce and understand WH questions with long distance dependencies (henceforth LDD questions), which involve a dependency between a WH word in the main clause and a gap in a subordinate clause (e.g. *What$_i$ do you think you are doing __$_i$?*), is generally thought to require access to complex and highly abstract syntactic representations. Research in the generative tradition (e.g. Thornton and Crain, 1994) suggests that LDD questions are acquired relatively early in development, and this finding has been used to argue that children as young as four or even three have access to such representations. However, a closer analysis of children's LDD questions reveals that they are extremely stereotypical: they nearly always have the form *WH do you think* + subordinate clause or *WH did you say* + subordinate clause. LDD questions involving these particular combinations of words are also relatively frequent in the input, so it is possible that children acquire lexically specific templates rather than abstract representations of the kind postulated in mainstream syntactic theories.

In this paper, we report on an elicited imitation study testing this hypothesis. 37 five- and six-year-old children and nine adult controls were asked to repeat prototypical and unprototypical questions with LDD dependencies and the corresponding declaratives. The prototypical and unprototypical variants were matched for length and contained the same lexical items, the only difference being that the words which occurred in the main clause in the prototypical variant were found in the subordinate clause in the unprototypical variant and viceversa:

Prototypical question:	What do you think the funny old man really hopes?
Unprototypical question:	What does the funny old man really hope you think?
Prototopical declarative:	I think the funny old man will really hope so.
Unprototypical declarative:	The funny old man really hopes I will think so.

As predicted, children made significantly more errors in the unprototypical variants of both constructions which supports the view that they are relying on lexically specific templates. A more detailed analysis of the errors provides further support for this claim. First, incorrect imitations often involved transforming the sentence so that it matched one of the templates, even if this resulted in a meaning change. For instance, children sometimes replaced the main clause verb in the unprototypical conditions with a 'prototypical' verb (i.e. *think* or *say*) or reversed the verbs in the main and subordinate clauses so that they ended up with a 'prototypical' verb in the main clause (e.g. *What does the tall young woman probably expect you think?* became *What does the tall young woman think you expect?*). Secondly, non-adult variants such as 'medial' WH questions (*What does the tall young woman probably expect what you think?*) were produced exclusively when attempting to imitate unprototypical questions. Finally, responses which suggest difficulties with understanding the stimulus sentence, such as amalgams of the main and subordinate clause (e.g. *What does the funny old man think?* for *What does the funny old man really hope you think?*) also occur overwhelmingly with unprototypical questions.

Sex differences in past tense overregularization errors

Evan Kidd, Jarrad Lum
[1]*University of Manchester,* [2]*Deakin University*

Hartshorne and Ullman (Hartshorne, J. K., & Ullman, M. T. 2006. Why girls say 'holded' more than boys. *Developmental Science, 9,* 21 – 32.) presented naturalistic language data from 25 children (15 boys, 10 girls) and showed that the girls produced more past tense

overregularization errors than did boys. In particular, girls were more likely to overregularize irregular verbs whose stems share phonological similarities with regular verbs. The result was argued to support the Declarative/Procedural model of language, a neuropsychological analogue of the dual-route approach to language. They argued that since girls are more likely to have better declarative memory systems than boys, they are also more likely to make overregularization errors via analogies made from similar sounding regulars. However, this explanation was only speculative; the authors had no independent measure of their children's declarative memory abilities, and based their conclusion on past research that showed only minor sex differences in declarative memory ability (Kramer, Delis, Kaplan, O'Donnell, & Prifitera, 1997). In the current study we present experimental data that are inconsistent with Hartshorne and Ullman's findings. Eighty children (40 males, 40 females) aged 5;0 – 6;9 completed a past tense elicitation task, a test of declarative memory, and a test of non-verbal intelligence. The children did not differ in their past tense overregularization rates, and nor did they differ in their performance on the test of declarative memory. In order to further test Hartshorne and Ullman's claim, we compared 20 boys with the lowest declarative memory scores to 20 girls with the highest declarative memory scores, matching for age and non-verbal intelligence. Although these two groups now differed in their declarative memory abilities ($t(28) = 7.92$, $p < .001$), they did not differ in their overregularization rates.

The results therefore revealed no sex differences in past tense overregularization. Instead, the best predictors of overregularization rates were item-level features of the test verbs: children were more likely to make overregularization errors on verbs that had low frequency past tense forms, and when they were from phonological neighbourhoods that included a large number of regular verbs. These results are consistent with past findings reported by Marchman, Wulfeck and Eliis Weismer's (1999). We discuss the results within the context of dual versus single route debate on past tense acquisition.

References:

Hartshorne, J. K., & Ullman, M. T. (2006). Why girls say 'holded' more than boys. *Developmental Science, 9,* 21 – 32.

Kramer, J.H., Delis, D.C., Kaplan, E., O'Donnell, L., & Prifitera, A. (1997). Developmental sex differences in verbal learning. *Neuropsychology*, *11*, 577–584.

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Symposium Session 6 - Wednesday 30 July 11.30 - 13.30
Symposium Number – S6-1

Chair: Stefano Vicari, *Ospedale Pediatrico Bambino Gesù*
Discussant: Jarrad Lum, *Deakin University*

Understanding linguistic and cognitive deficits in SLI: Insights from neuropsychological research into the impairment

Description:
There has been a wealth of proposals forwarded to account for the dissociation between language and intellectual functioning in Specific Language Impairment (SLI). Cognitive descriptions of SLI have made reference to impairments with memory, auditory processing, processing speed and computations involved with marking tense and agreement. Much less is known about brain-behaviour relationships in SLI. In this symposium recent research examining the neurological correlates of linguistic and cognitive deficits in SLI is presented. The papers describe research which have examined the functioning of specific neural structures and as well as their connectivity. The discussion centres on whether the relationship between neurological and behavioural impairments should be best understood in terms of a specific neurological loci or more diffuse pathology. The implications this has for our understanding of the underlying nature of SLI is also considered.

Interhemispheric interaction in children with SLI: The role of the corpus callosum in generalised processing deficits

Jarrad Lum
Deakin University

A number of studies have indicated generalised processing deficits in specific language impairment (SLI). In general terms it is thought that children with SLI have fewer cognitive resources to process information. In the current study we present neuropsychological evidence which considers the role of the corpus callosum in relation to processing deficits in this population.

In general terms the processing of computationally simple verbal and spatial information is undertaken by the left and right hemispheres respectively. However, as task complexity increases, both hemispheres become involved. This is achieved, in part, through the corpus callosum which connects the two hemispheres. In this study tests of interhemispheric interactions were presented to 20 children with and without SLI. The results indicated that children with SLI were less efficient at integrating information between two hemispheres. These results were found for both visual and auditory information. It was suggest the neural connectivity may contribute to some of the cognitive deficits reported in SLI.

Are SLI children at risk of literacy problems in a language with transparent orthography? A study on Italian SLI in adolescence

Daniela Brizzolara[1], Anna Maria Chilosi[2], Filippo Gasperini[1,2], Pierluigi Zoccolotti[3,4]
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Italian SLI children can show varying degrees of written language difficulties in the first two years of primary school (Brizzolara et al 1999, 2007), depending on the nature, severity and persistence of language problems. Long- term outcome of literacy problems of these children has however been scarcely explored. 16 adolescents and young adults diagnosed in our tertiary care University Research Hospital as SLI in pre-school years and 32 controls matched for age, gender , PIQ and scholastic curriculum were administered a battery of reading, writing, phonological working memory (non word repetition) and oral language tests. As a group, the subjects with pre-school SLI had significantly lower scores, compared to controls, in all measures of oral and written language; at an individual level, 50% of pre-school SLI met the diagnostic criterion for dyslexia (reading speed and accuracy greater than -2 s.d. from the mean). The results of the present study will be discussed in the framework of the complex co-morbidity of SLI and dyslexia (Bishop and Snowling, 2004; Catts et al., 2005).

How specific is SLI?: New neuropsychological data

Stefano Vicari, Deny Menghini, Francesca Addona
[1]*Ospedale Pediatrico Bambino Gesù,* [2]*LUMSA*

Specific Language Impairment (SLI) is usually defined as one or more deficit in linguistic functioning but "normal" cognitive development. Nevertheless, associated impairments in extra-linguistic neuropsychological competencies have been described. Namely, deficits in visual spatial processing, long term memory and in executive functions have been reported. Consequently, the term "specific" is under review.

In the present paper we report neuropsychological data from children with SLI (N=17) as compared with those of typically developing children matched for chronological age (N=17) and for linguistic age (N=17).

Results confirm deficits in the SLI group in metaphonological competencies but also impairment in visuospatial processing, long-term memory and attention.

The implications this has for our understanding of the underlying nature of SLI and brain regions may be involved in the disorder will be considered.

Memory and the English past tense: One or two mechanisms?

Evan Kidd
University of Manchester

Ullman (2004) has proposed that the procedural and declartive memory systems play separate roles in the acquisition of regular and irregulars forms of the English past tense. Procedural memory is implicated in the learning and processing of the regular pattern (e.g., walk => walked). Declarative memory is required for learning and storing irregular forms as whole lexical items (e.g., go => went). The present study investigated these claims in 100 children aged between 4 – 6 years.

The children were tested on a battery of tests asessing memory, vocabulary, non-verbal intelligence, and past tense formation. The results did not show associations between measures of declarative and procedural memory and irregular and regular past tense formation. However, a series of path analyses indicated that the children's knowledge of regular and irregular past forms could be predicted from vocabulary, which, in turn, was predicted from the measure of declarative memory.

The results were interpreted to suggest that there is not a one-to-one mapping between long-term memory systems and grammatical phenomena. Instead, the results support the view that grammar can be considered to be a property of children's lexical knowledge, which in turn is supported by the declarative memory system.

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30
Symposium Number – S6-2

Chair: Tanja Kupisch, McGill University
Discussant: Cécile de Cat, University of Leeds

How do pragmatics and semantics relate to the emergence of articles and pronouns?

Description:

This symposium relates recent findings on the acquisition of articles and pronouns across languages. The use of both forms depends on semantic and pragmatic factors: (i) specificity of the referent, (ii) physical presence of the referent, (iii) givenness in discourse and (iv) the listener's familiarity with the discourse referent. These distinctions overlap to some extent, and some language-specific patterns of article choice can be found to express more fine-grained semantic distinctions. In general, however, the following form-function combinations can be distinguished:

(i) Specificity: A noun phrase is specific if the speaker wants to refer to a unique individual in the set denoted by the NP (Fodor & Sag 1982). Specific reference can be expressed by definite or indefinite marked noun phrases as well as by pronouns.

(ii,iii) Physical presence of the referent and givenness in discourse: A referent that is physically present or given in discourse is normally referred to by a pronoun or by a definite marked NP.

(iv) Familiarity: A referent that is not familiar to the listener must be introduced by an indefinite marked NP. It cannot be referred to by a pronoun or a definite NP (Heim 1991).This symposium shall focus on how these semantic-pragmatic factors influence both the omission and production of articles and (object) pronouns.

More specifically, the following questions are addressed:

1) Can the omission of determiners and objects be attributed to cognitive deficits, more specifically, to the lack of semantic knowledge (the specific-nonspecific distinction) and pragmatic knowledge (the familiar/non-familiar distinction)? (See e.g. De Villiers & Roeper 1995, Schafer & De Villiers 2000, Matthewson & Schaeffer 2000, Matthewson et al. 2003)

If so, and all else being equal, this makes the following predictions. First, omissions should occur in certain semantic and pragmatic contexts. Second, (object) pronouns and definite marked NPs should be acquired simultaneously. That is, once children use articles correctly, they should also have the cognitive prerequisites for producing pronouns. Third, there should be no variation across languages. Last, once children use these forms, they should also use them correctly. The issues will be addressed in all three contributions.

2) Can determiner and object omissions be explained by morphological or phonological complexity? (see Kupisch et al. 2007)

If so, this predicts cross-linguistic differences, shown to be borne out by a comparison of each individual contribution to our symposium. In addition, 2) predicts differences between the acquisition of pronouns and articles in languages where these have different forms, but similarities in languages these forms overlap (e.g. French and Italian). The latter will be addressed especially in the first two contributions.Our colloquium provides case studies from the languages French, Italian, Spanish, German, and Norwegian, showing that the appearance of articles and (object) pronouns is subject to considerable variation across and within languages. Furthermore, articles and (object) pronouns are not acquired simultaneously. We argue that cognitive factors cannot be crucial for omissions.

The role of phonological and morphological factors in the acquisition of articles and pronouns in a north Norwegian dialect

Merete Anderssen
University of Tromsø

Reseach into the acquisition of determiners and pronouns has to a great extent focused on the question of what factors determine acquisition. One proposal maintains that omission and production of determiners and pronouns are influenced by semantic pragmatic factors, while another attributes these aspects to morphological and phonological complexity. On the, perhaps unlikely, assumption that acquisition cannot be influenced by both, these two views make different predictions regarding the acquisition of pronouns and

determiners; the former predicts little or no cross-linguistic variation in the acquisition of these elements, while the latter does, as acquisition is dependent on the form that they take in individual languages.

This paper discusses the extent to which phonological and morphological factors play a role in the acquisition of articles and pronouns in a Norwegian dialect, the Tromsø dialect. This dialect represents a good test case of the extent to which the form of lexical items determine acquisition because in addition to third person pronouns and a suffixal definite article which is very different from them, this dialect also makes use of an article (referred to as a proprial article) with kinship tems and proper nouns, which is homophonous with masculine and feminine pronouns. An example of the suffixal article is given in (1), a proper name with a proprial article is found in (2) while an example of the masculine pronoun is seen in (3).

(1) **Gutt-n** spiste et eple
Boy -the ate an apple
(2) **Han Peter** spiste et eple
He Peter ate an apple
(3) **Han** spiste et eple
He ate an apple

The present paper examines the acquisition of the definite suffix, the proprial article and the masculine and feminine third person singular pronoun in a child acquiring the Tromsø dialect, and compares these according to time and rate of acquisition. A purely semantic/pragmatic based approach would predict that the suffixal article in (1) and the pronoun in (3) should be acquired at a similar age (and possibly also the proprial article in (2) dependent on what kind of semantic contribution it is assumed to make), while the morphological/phonological model predicts that the proprial article in (2) and the pronoun in (3) should be developmentally similar.

Articles and clitic pronouns in the acquisition of Italian and Spanish

Neal Snape[1], Tanja Kupisch[2]
[1]Hokkaido University, [2]McGill University

The paper is concerned with the acquisition of articles and clitic object pronouns in the speech of two Italian-speaking children and two Spanish-speaking children between the ages of 1;8 and 2;6. Most definite article forms in these languages are homophonous with the third person clitic forms, as the following examples show.

(1) It. le ragazze, le ho viste
The girls them have–I seen
"The girls, I have seen them. "
Sp. la chica, no la voy a dar el arróz
The girl not her I'm going to give - the rice
"The girl, I'm not going to give her the rice. "

In addition, object clitics and articles have been assigned the same syntactic structure. Both are supposed to fill the head position of the DP, the difference being that the article takes a noun as its complement, while the complement of a clitic pronoun is a phonetically empty N (Uriagereka 1995).

(2)

It.		Sp.	
D		D	
/ \		/ \	
D N		D N	
le ragazze		la chica	
le Ø	(ho viste)	la Ø	(voy a dar el arróz)

Object clitics and articles are also parallel in terms of the pragmatic conditions of use. Both may be used with reference to objects or things that are familiar to the addressee of an utterance, while they may not be used with reference to things, persons, objects that are not identifiable for the hearer.

All of this suggests that determiners should be acquired simultaneously with definite articles. However, our preliminary results suggest the contrary. Articles are produced to a greater extent in obligatory positions than object clitics. Phonological complexity, morphological complexity and cognitive load do not provide satisfying explanations for our findings. We follow Pérez-Leroux et al. (2006) relating our findings to semantic learning. Both articles use and clitic object use involve the mapping of semantic properties onto syntax. The count/mass property results in contrastive use of different article types (definite vs. indefinite/zero), but the count/mass property can, to a great extent, be inferred from the shape of the referent (substance vs. objects) in the extra-linguistic context. As for object clitics, the question whether they may be used or not depends on the argument structure of the verb, which cannot be inferred from the extra-linguistic context.

French children's sensitivity to pragmatic aspects in article and pronoun use

Anne Baker, Margot Rozendaal
University of Amsterdam

The use of morphosyntactic forms depends on various pragmatic aspects, amongst other things on whether the referent is (1) is new versus given to discourse, (2) familiar to the listener on the basis of shared (world) knowledge or (3) familiar to the listener on the basis of perceptual availability, which makes deixis possible (e.g. Clark & Marshall 1981, Ariel 1993). In adult French, these pragmatic aspects influence both articles use (indefinite versus definite) and also the use of pronouns versus nouns. In general, indefinite articles indicate newness and are therefore appropriate to refer to new, unfamiliar entities. In contrast, the more given or familiar a referent is, the more appropriate the use of a pronoun will be. In language acquisition, therefore, children are faced with learning diverse skills: they have to acquire the relevant morpho-syntactic forms (e.g. articles, pronouns etc) and learn the pragmatics of language.

The acquisition of morphosyntactic forms takes place fairly early in French (at 1-3 years). The acquisition of pragmatic skills however takes some time: even at 8 years children are still over-estimating the listener's knowledge in telling narratives (Hickmann 2003). However, in English, 2-year-olds have been shown to be sensitive to more subtle pragmatic distinctions: they adjust their communicative attempts according to whether a referent is new or given for the interlocutor (O'Neill 2005) and drop pronouns for referents that were previously mentioned in the discourse (Serratrice et al. 2004).

The developmental course of French children's pragmatic sensitivity is not clear: it is unclear which pragmatic aspects children apply in their use of morphosyntactic forms and also if they apply the same pragmatic aspect to the use of both articles and pronouns. This study aims to fill these gaps.

Longitudinal conversational data from four French children (2;0 to 3;3) were taken from CHILDES. Person and object reference is analyzed every three months (av. 400 references per age point per child). The focus lies on the use of nouns with indefinite versus definite articles and pronouns versus nouns for (1) givenness in discourse, (2) shared knowledge and (3) perceptual availability of the referent.

For new/given in discourse, the results show that from 2;0 onwards indefinite articles are correctly applied to new referents only (low error rate <10%). The use of pronouns for given referents is developing between 2;0 and 3;3 (from 30% to 80%.). The children are not sensitive to the presence/absence of mutual knowledge in article choice: they incorrectly use definite articles to introduce referents when there is no shared knowledge (error rate 50%). In contrast, pronouns are hardly used to introduce a referent to discourse that is not mutually known and not perceptually available (low error rate: <10%). This however, can be related to the deictic properties of pronouns

To conclude the morphosyntax-pragmatics interface is present from the start of language use. It is acquired on a form-by-form basis and different aspects of this interface are acquired at different rates.

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30
Symposium Number – S6-3

Chair: Johanne Paradis, *University of Alberta*
Discussant: Elena Nicoladis, *University of Alberta*

Input factors in bilingual acquisition

Description:

Children acquiring two languages, either simultaneously or sequentially, have more variable input in each language than monolinguals. Variability can be quantitative or qualitative. By dint of their dual language experience, bilinguals receive less exposure to each of their languages than same-aged monolinguals, and that exposure time is seldom perfectly balanced between their languages. Bilingual children can have their exposure to each language confined to certain contexts, i.e., home or school, hear more dialect and register diversity in one versus the other language, and experience shifts in the amount of each language spoken in the home over time. Their two languages could vary in minority-majority status, affecting both quantity and quality of input, as well as attitudes toward each language. These sources of input variability for bilinguals are additional to the sources of variability present in all children's input, e.g., maternal education levels or birth order, which have been documented to influence language acquisition (Fenson et al., 1994; Hoff, 2003).

The impact of input variability on bilingual patterns and rates of development has attracted recent attention from researchers working in both generativist and constructivist theoretical frameworks (Gathercole, 2007; Nicoladis et al., 2007; Paradis et al., 2007; Sorace, 2005; Perez-Leroux et al., 2006). Each theoretical framework makes different predictions about the interaction between input and child-internal mechanisms in the acquisition process, and bilingual development can offer important insights into the nature of this interaction (cf. Gathercole & Hoff, 2007). The purpose of this symposium is to bring together researchers who have been studying bilingual acquisition within different social contexts in order to explore the impact of dual language input on children's developmental patterns and rates. Our goal is to contribute to theoretical debates on the role of input in acquisition, as well as to provide a strong empirical base for understanding bilingual development that is relevant to the needs of research end-users, such as educators and speech-language pathologists.

Research will be presented on Spanish-English children from Miami in the United States, Welsh-English children in Wales, United Kingdom, and French-English children in Canada, ranging in age from preschool until the end of primary school. Comparing across this set of contexts allows for contrasts along the continua of minority versus majority language status, and long-standing versus new-arrival populations. Thus, these presentations will provide a broader view of the role of sociolinguistic and sociopolitical context on bilingual development than would be available from studies focused within a single context. Studies to be presented examine bilingual children's lexical, semantic, and morphosytntactic acquisition, and their sensitivity to quantitative and qualitative input factors. Systematic comparisons are made between bilinguals and monolinguals, as well as between the two languages of the bilinguals. Together these presentations point to a nuanced view on the relationship between input and bilingual acquisition that challenges the assumption of a global "bilingual deficit". This collection of research reveals a complex picture of how the course of child language development is both sensitive and robust in the face of dual language input.

Relationship between amount of language exposure and language scores in older preschool children acquiring French and English simultaneously

Elin Thordardottir
McGill University

The identification of language impairment in bilingual children is complicated by the lack of a normative database to which their performance can be meaningfully compared. Although it is recognized that evaluation of bilingual children's language must include both languages, it is not clear how results of such an evaluation should be interpreted. Young bilingual children are generally expected to score lower than monolingual peers when evaluated in each language separately, but it is not clear how wide this gap typically is, nor how its size is related to factors such as the age of the child and the child's amount of exposure to each language. In a recent study, Elin Thordardottir et al. (2006) documented the performance of normally developing bilingual toddlers (age 2:6 to 3:0 years) acquiring French and English simultaneously with equal exposure to both. The bilingual children scored below the normal monolingual range in each language in comprehension and production, and in both vocabulary and grammar.

The present study extends this investigation to older preschool children to ask whether at age 4;6 to 5;0, right before the children enter school, the gap in language test scores between bilingual and monolingual children has diminished compared to younger children, and whether the language scores of bilingual children in this age range are systematically related to their amount of exposure to each language. Participants were 38 children, mean age 59 months (SD 4.5), including monolingual speakers of English and French respectively, and children acquiring English and French simultaneously, with a wide range of patterns of relative amounts of exposure to each language, documented through parent report. Monolingual children were tested once; bilingual children were tested in each language in separate sessions, with the order of sessions counterbalanced. Children were administered tests of nonverbal cognition, language, and working memory. Language tests focused on vocabulary (PPVT-EVIP and Boehm Test of Basic Concepts) and grammatical development (subtests of CELF-4 and NEEL) as well as spontaneous language. Correlational analysis revealed a significant, and for several tests, strong relationship between amount of language exposure and language scores, including scores on standardized tests of vocabulary and syntactic ability, and verbal processing (Nonword repetition and sentence imitation). However, mean length of utterance (MLU) from spontaneous language samples, was not significantly correlated with exposure pattern. ANOVA analysis comparing groups of monolingual children and children with mostly English or mostly French exposure revealed significant differences as well. Significant findings were not uniform, however: The bilingual children's scores in English showed a stronger

association with exposure pattern than did their French scores, with several tests showing a significant correlation only in English. This finding may be related to the sample size of children tested to date, and/or to properties of the tests used. Alternatively, it may point to cultural and motivational factors that affect bilingual language development in addition to amount of exposure.

How input factors differentially influence bilingual lexical and grammatical acquisition

Johanne Paradis[1], Antoine Tremblay[1], Martha Crago[2]
[1]University of Alberta, [2]Université de Montréal

This talk is focused on examining the relative influence of input factors on different domains of language in a context highly favourable to successful bilingual development. Language(s) spoken in the home and parental education have been documented to influence school-aged bilingual children's rates of development and the extent of differences from their monolingual peers. This has been found across different social contexts, such as Miami, USA and Wales, UK, and across different linguistic and literacy skills (e.g., Gathercole, 2007; Oller & Eilers, 2002). The research to be presented investigates the impact of these input factors on Canadian French-English bilingual children. Canada differs from the other social contexts studied because French and English are both currently and historically high status languages, receiving full legal and institutional support nationwide, and French-English bilingualism is regarded as prestigious. Research questions were (1) How do language(s) in the home and maternal education influence bilingual children's linguistic abilities? (2) Are bilingual children's lexical and grammatical skills equally affected by these input factors? (3) How do bilingual children compare in linguistic attainment with monolingual age-mates in each language? We hypothesized that language(s) in the home and maternal education would affect both children's lexical and grammatical abilities in their languages, but differentially, such that that these input variables would exert a stronger influence on lexical development. This is because vocabulary growth is open-ended with diverse individual outcomes, while morphology is a finite system with relatively uniform individual outcomes. In addition, acquisition of the target morphology examined in this study is possibly constrained by internal linguistic maturation (Rice, 2003; Wexler, 2003). We also hypothesized that French-English bilingual children in Canada would approach monolingual levels of linguistic attainment more rapidly than bilingual children in the other social contexts examined.

Data to be presented come from 81 children in 1st and 6th grade at French mother tongue schools in an English majority Canadian city. Tasks included both standardized tests and experimenter-made procedures measuring children's receptive vocabulary, morphological production, and ability to detect errors in the use of morphology. Detailed parental questionnaires were used to gather information about input factors. Tense-marking inflections and auxiliaries in English and direct object clitics in French were the target morphological structures.

ANOVA and multiple regression procedures revealed the following: Language(s) in the home was more predictive of children's linguistic development than maternal education, although the effect of language(s) in the home nearly disappeared by 6th grade for most measures. Both variables were more predictive of children's lexical than grammatical acquisition, and furthermore, age explained more variance in the morphological tasks than language(s) in the home. First grade children came close to achieving monolingual age-expected norms for vocabulary size, but not for morphology. Sixth grade children showed no differences with monolinguals in either vocabulary or morphology. These bilingual-monolingual comparisons reveal a narrower gap between these two groups than has been documented elsewhere.

These results point to the differential influence of external versus internal factors on lexical and grammatical acquisition. These results also point to an interaction between familial input factors, such as language(s) in the home and parental education, with the broader sociolinguistic context in their determination of bilingual acquisition outcomes and how they compare to those of monolinguals.

Input, linguistic complexity and cognition: An interactive model of bilingual development

Virginia Mueller Gathercole
University of Wales

This talk proposes an interactive model for bilingual development in simultaneous and early bilinguals. It draws on data from two bilingual populations, Spanish-English bilinguals in Miami and Welsh-English bilinguals in North Wales, to examine the roles of exposure/input, linguistic complexity, and cognition in determining the course and timing of development, on the one hand, and the nature of interactions between the bilingual's two languages, on the other.

Data come from a variety of studies on morpho-syntactic and semantic processing in bilingual (and monolingual) children and adults. These include the acquisition and processing of grammatical gender, of participant roles and word order in sentences, of lexical development, and of semantic and ontological categories. With regard to course and timing of development, the data point in general to parallel developments in bilinguals and monolinguals for most structures. However, due to less frequent exposure in each of their languages, bilinguals require more time to acquire the critical mass of input needed to construct the abstract structures governing the constructs in each language.

At the same time, the data point to important differences regarding possible interactions between the bilingual's two languages. In some areas of language, relatively little interaction is observed: in particular, in relation to "local" or lexically specific morpho-syntactic structures in each language. In other areas, greater interaction is observed: this appears particularly to be the case either where broad patterns govern the expression of "abstract" meaning components--e.g., participant roles, topic/focus, illocutionary force--or where semantic elements are intertwined with cognition--e.g., in the establishment of language-specific categories, especially where these differ across the two languages.

The model proposed aims to explain and make predictions regarding a variety of phenomena in bilingual language development and processing. These phenomena include: differential timing of acquisition in monolinguals versus bilinguals, the importance of linguistic complexity in development, differential interaction patterns across distinct sub-structures of language, and potential differences in bilinguals' ultimate attainment in majority versus minority languages.

Qualitative issues in bilingual children's minority language input

Barbara Zurer Pearson[1], D. Kimborough Oller[2], Todd Gibson[2], Rosanna Resende[3]
[1]University of Massachusetts, [2]University of Memphis, [3]University of Miami

This talk shifts our focus to the quality and sources of children's language models and to alternative hypotheses about the extent to which non-native language models give rise to non-native patterns in learners. Investigations of bilingual acquisition have been instrumental in highlighting the role of input for language acquisition more generally (Gathercole & Hoff, 2007). Quantitative differences measured in hours per week over a period of years have been shown to make relatively precise predictions about how quickly or how well groups of bilingual children will learn one or the other of their languages (PFLO, 1997). However, differing outcomes for a majority versus a minority language (Vihman et al. 2006; Allen, 2007) indicate that other factors beyond simple quantity influence bilingual proficiency and language choice. Children's incomplete acquisition of a language has been attributed to insufficient exposure, but the quality of the child's language models as a source of non-native proficiency has been less investigated. Jacobson (in progress) provides some evidence to suggest that childcare workers (and English language models) in Hispanic communities in New York were

the probable source of children's difficulty learning irregular versus regular past tense forms, especially in the absence of other native-speaker models. We apply this perspective to the minority language.

Data are presented from a survey of Spanish-English bilingual adults from many different Central and South American countries living in Miami. The items on the survey were questionable usages in Spanish found in a corpus of children's narratives collected from bilingual children at ages 7 and 10 (Pearson, 2002). Participants completed a detailed language questionnaire describing country of origin, years of education in Spanish, age of acquisition of English, etc. They then gave acceptability judgments about the constructions taken from the children's stories and indicated whether they used the constructions themselves. Regardless of educational level, participants from Central America and the Caribbean were more accepting in general than their more prescriptive compatriots from South American countries, suggesting that some of the children's errors derived from an unstable adult target, owing perhaps to the diverse sources of the Spanish dialect spoken in Miami and the preponderance of Central Americans there.

Other data suggest that in determining children's language choice—and subsequent proficiency in the minority language—not all sources of input are equal. Who speaks the minority language may be as important as how much it is spoken in determining how well it will be learned. The deep description data in Oller & Eilers (2002, chapter 3) shows that the children who had been exposed primarily to Spanish for most of their lives showed a strong preference to speak English to classmates even in schools where Spanish was used by teachers nearly half of each school day. Likewise, Hakuta & D'Andrea (1992), and Luo & Wiseman (2000) show that for older children peer factors are more crucial than adult attitudes and use.

Group socialization theories from sociology, such as Harris (1995), may help explain the patterns observed in minority language acquisition. According to Harris, transmission of culture filtered through the peer group has a more lasting effect than cultural inheritance from the family. This theoretical posture is consonant with the claim that language selection is primarily determined by the language of peers (Bickerton, 1983).

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30
Symposium Number – S6-4

Chair: B May Bernhardt, *University of British Columbia*
Discussant: B May Bernhardt, *University of British Columbia*

Vowel development in non-Indo-European languages

Description:
Acquisition of vowels by children is an understudied area of research, especially for non-Indo-European languages. The purpose of the current symposium is to discuss vowel acquisition in three unrelated non-Indo-European languages: Hungarian (a Uralic language), Korean (an isolate) and Zapotec (an Otomanguean language from Mexico). These widely diverse languages provide a forum for discussion of vowels with contrastive voice qualities (modal, breathy, creaky) that can appear singly or in combination within a single vowel nucleus (Zapotec), for diphthongs that are less common in Indo-European languages (Korean and Zapotec), for contrastive vowel length (all three languages), for tone (Zapotec, but with a complex relation between tone and voice quality), and front rounded vowels (Hungarian). Counting length contrasts and diphthongs, all three languages have fairly large vowel inventories. The papers on Korean and Zapotec focus on children's vowel acquisition, whereas the Hungarian paper focuses on parental input to children, showing modifications in the parents' vowels as the child develops.

The limited amount of research on vowel development in non-Indo-European languages reflects the small number of studies of acquisition in non-Indo-European languages and methodological challenges in the study of vowels. Vowels have less precise articulatory configurations than consonants and thus determination of prototypical vowel articulations within and across speakers is challenging. Characterization of children's vowels is even more challenging, because of the children's developmental changes in vocal tract size and configuration. Children's vowels are also less amenable to typical acoustic analyses than adult vowels because of their higher formant frequencies and wider vowel space. In spite of the methodological challenges, new data on non-Indo-European languages and alternative acoustic analyses support renewed initiatives in vowel research. Acoustically, measurement can be enhanced by band-filtering analysis that minimizes the dependence of the results on F0 to measure the spectral envelopes in children's utterances and by computerized Principal Component analysis, which allows many more vowel tokens to be analysed than by typical acoustic analysis. (Previous research by Pols, 1977, suggests that the first two principal components of the spectra are related to the F1 and F2 values of vowels.) The symposium will provide data and insights regarding monolingual vowel acquisition through individual presentations that: (1) discuss three insufficiently studied languages with diverse and complex vowel systems, including one language (Zapotec) that has uncommon contrastive voice qualities, (2) utilize different methodologies in vowel analysis (both more traditional perceptual and acoustic analyses and less common principal component analysis), and (3) address changing productions over time both for children (Korean, Zapotec) and their caregivers (Hungarian, Korean). Cross-linguistic comparisons between the languages and with English highlight the need for studies of a variety of languages to elucidate what is common across languages and what is more language-specific. Furthermore, the longitudinal data from the children and adults provide a window into the timing of language-specific development and the changing role of input in the acquisition process.

Modelling vowels to young children: Data from Hungarian-speaking dyads

Krisztina Zajdo
University of Wyoming

Caregiverese addressed to young infants uses hyper-articulated vowels cross-linguistically. Sundberg (1998) hypothesized that the acoustic/phonetic properties of caregiverese change with the child's increased speech performance. Mothers may model vowels that provide the child with input about different aspects of vowel production as the child's level of speech performance increases. To test this hypothesis, the production of Hungarian vowels in eight boys each at ages 2;0, 2;6, 3;0, 3;6 and 4;0 years and their mothers were examined. Mothers modelled pV(:)1p1V(:)1 structured tokens to elicit their children's production in conversation. A band-filtering analysis method was used that minimizes the dependence of the results on F0. Data reduction was achieved via Principal Component analysis; using the first 2 eigenvectors of the vowel spectra, reference planes were created. To compare the vowels of children and their mothers, all data were projected onto a reference plane defined by the pc1-pc2 vowel measurement points from C1V(:)1C1V(:)1 structured tokens embedding all Hungarian vowels produced by the mothers of 4;0 year olds. One hundred randomly selected measurement points in each vowel category identified the vowel triangle space. Mapping vowel qualities onto the reference planes suggested that children organize the acoustic space differently at different ages. While the positioning of some vowels (e.g., /a:/, /o/) remains relatively constant, other vowels are positioned in different areas of the vowel space at different ages, e.g., /u:/ is positioned as an increasingly higher back vowel, being fronted significantly in 4-year-olds. The vowel /i:/ starts out by being positioned into a relatively high but centralized area of the vowel space at 2;0, followed by an increasingly higher and more frontal area of the vowel space. The positioning of the mothers' vowels within the acoustic space depended on the age of children addressed. When modelling vowels to 2-year-olds, mothers produced relatively low /a:/ vowels, high-central /i:/ vowels and /u:/ vowels that were back but not very high. When

addressing 4;0 years olds, mothers produce the most fronted vowels, with a position closest to adult-like vowel production. Overall, caregiverese resonated with the children's development, with quality of the mothers' vowels modelling more adult-like phonetic/phonemic categories over time, as the children's skills increased.

A comparison of vowel development in Korean and English-speaking children

Soyoung Lee
University of Wisconsin

Relatively few vowel studies have been conducted to date. The present study examined vowel production of Korean and English-learning children at four different age ranges (1, 2, 5, and 10 years of age). Four Korean- and four English-learning infants' vocalizations at 1 and 2 years of age were collected in a play setting. Sixty Korean children and 60 English-speaking children's vowels were collected using picture card elicitation, with subjects asked to repeat each target word 3 times. For infants' speech, both perceptual transcription and acoustic analyses were conducted. For children's speech, a perceptual test was done to verify that all target vowels sounded correct to native listeners. The first and second formant frequencies of the vowels were analyzed using an acoustical analysis program. The perceptual transcription analysis showed the percentage of each vowel category to differ between Korean- and English-learning infants. At one year of age, the Korean-learning infants predominantly produced low-central vowels while English-learning infants frequently produced front vowels. Acoustic data also showed different patterns cross-linguistically. The vowel space in the English-learning infants appeared diffuse while the Korea vowel space appeared compact. The different cross-linguistic patterns were more obvious at 2 years of age. Language-specific vowel systems were even more apparent in children's speech than in infants' speech. At age 5, children already demonstrated acoustic patterns corresponding to their native vowel system. Among the three corner vowels, F1 and F2 of [a] and [i] for Korean- versus English-speaking children were significantly different. At age 10, differences were found for all three corner vowels, and reflected the adult language targets. The results of this study support the previous findings of cross-linguistic differences for vowel production during infancy (Boysson-Bardies et al., 1989). The language-specific differences among vowels were evident in infancy, but became more precise over time. In a related finding, the different vowel patterns were also consistent with vowel patterns of infant-directed speech in Korean versus English languages (Lee et al., in submission). The cross-linguistic similarities and differences will be highlighted and theoretical implications for the developmental process concerning vowels discussed.

Vowel acquisition in Valley Zapotec

Joseph Stemberger, Mario Chavez-Peon
University of British Columbia

This paper is part of an ongoing investigation of first language acquisition of Valley Zapotec (an Otomanguean language with about 2000 native speakers) in the village of San Lucas Quiaviní (Oaxaca, Mexico). We have data from 43 monolingual children aged 1;2-7;2 with over 100 hours recorded (partly cross-sectional, partly longitudinal, with the majority of children recorded in sessions a year apart, and 8 children followed for four years), but I will focus on a subset of children here. Tasks include naming of pictures and objects, describing actions in videos, and story-book descriptions (e.g., the Frog stories). This language has six monophthongs and 10 diphthongs (4 rising, 6 falling). There are 3 contrastive voice qualities: modal, breathy, and creaky (and marginally a fourth: checked); a given syllable nucleus may have a single voice quality or combinations in various contrastive orders up to three different voice qualities. There are gender differences in voice quality: men tend to have more pronounced creakiness, and women more pronounced breathiness. Analysis of vowel development patterns is based on transcription and on acoustic analysis. There are no detailed phonetic studies of the adult language, but some are in progress in our laboratory. Development of vowel quality appears reasonably rapid (as in many languages), but for some children errors may persist past 3;0. Commonly observed patterns include lowering and backing of /e/ to [a] and simplification of diphthongs (processes that have also been observed in other languages). Voice quality is not mastered early. Although most children produce all three voice qualities by 2;0, substitution of model voice quality in place of breathy or creaky voice is still commonly observed past 5;0. Children's voice quality tends to resemble that of adult women (pronounced breathy voice, more subtle creaky voice). Sequences of different voice qualities on a single vowel or diphthong are difficult, and they are often simplified to a single (marked) voice quality. Creaky Harmony and Breathy Harmony have been observed between vowels in disyllabic and longer words. We will discuss similarities to (and differences from) vowel development in English-speaking children, including use of non-contrastive voice qualities in English.

Symposium Session 6 - Wednesday 30 July 11.30 - 13.30
Symposium Number – S6-5

Chair: Brian MacWhinney, *Carnegie Mellon University*
Discussant: Brian MacWhinney, *Carnegie Mellon University*

Machine learning of language from CHILDES corpora

Description:
Chomsky (1961, 1965) characterized the central challenge of linguistics as the formulation of a grammar that could be learned on the basis of the evidence available to the child. One approach to learnability characterizes language as a formal system and attempts to show how a set of procedures could, in the limit, identify this system. Another approach, examined in this symposium, uses computational algorithms to induce specific linguistic patterns and rules from realistic corpora of adult input to the child. In this second approach, the success of a computational framework is determined by its ability to mimic the course of language development in the child. To measure this, we must have corpora that closely match actual input to the child and coding of these corpora that are amenable to analysis by the computer.

The corpora developed by the Child Language Data Exchange System (CHILDES) provide a comprehensive framework for testing proposed learning systems. The CHILDES system now provides automatic part-of-speech tagging for corpora in English, Italian, Spanish, French, Mandarin, Japanese, and Cantonese. Moreover, for English, the GRASP system can use these part of speech tags to produce automatically a highly accurate dependency graph that encodes a set of 28 possible grammatical relations.

The English CHILDES database now contains 15 million words, which makes it the largest corpus of spoken, informal English currently available. Because of this size, the corpus can provide strong tests of alternative computational approaches to language induction.

In this symposium, we will examine progress in five types of learning systems.

1. The DEV-LEX model uses CHILDES corpora to extract lexical patterns and part of speech class as a preliminary to the larger task of grammar induction.
2. The ADIOS system uses TAG-like processing to statistically distill out fragments of a context free construction-type grammar.

3. The MOSAIC model uses an n-ary discrimination net to produce novel utterances on the basis of previously encoded fragments. MOSAIC also enforces a bias to generate utterances from sentence final position.
4. The Bayesian model shows how a probabilistic context free grammar can induce hierarchical structures from CHILDES corpora without prior encoding of specific facts regarding structure dependency.
5. The Human Speechome Project seeks to expand the computational encoding of the input to the child through dense sampling, computer vision cue extraction, and cross-channel early lexical learning (CELL).

The presentations in this symposium will explain the goals and functioning of each computational system. They will also explore ways in which alternative systems can be tested against common benchmark goals. In the area of parser technology, community attempts to increase parsing accuracy for an accepted gold standard corpus, such as the Penn TreeBank, have led to continual improvements in theory and practice. In the area of child language learning, we will explore how a similar methodology could be constructed for the testing of systems against tagged and parsed CHILDES corpora.

Self-organized learning of the lexicon from CHILDES input

Ping Li[1], Brian MacWhinney[2]
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How do children develop structured mental representations for the vast number of words in their language? How do bilingual speakers deal with the even more daunting task of organizing two lexicons? Despite progress made by previous computational models of language acquisition, answers to these questions have been limited in three important ways. First, many previous models have used artificially generated input representations, rather than training sets derived from actual speech input to children. The use of these synthetic or highly simplified vocabularies inputs fail to make direct contact with the detailed statistical properties and word forms of the naturalist input that children receive. Second, most previous models have failed to extend the size of the input corpus to a level that adequately simulates the actual growth of the lexicon. Finally, many previous models have relied on supervised learning within the backpropagation framework.

In the last few years we have attempted to correct each of these problems by developing the DEVLEX model that builds up realistic lexicons that match up with the characteristics of the input in the monolingual and bilingual learner's environment. In particular, we can now model the acquisition of actual lexical forms from the parental speech in the CHILDES database (MacWhinney, 2000) to achieve developmental and lexical realism. DEVLEX relies on principles of self-organization and Hebbian learning by connecting multiple self-organizing maps in a system. Combined with various data compression methods, DEVLEX is able to simulate the continually expanding nature of the lexicon during the course of learning.

DEVLEX models have been constructed for both monolingual and the bilingual acquisition. In the case of monolingual acquisition, we observe rapid vocabulary growth in our model during early stages of learning, a process that we attribute to the system's building of a structural representation that prepares the basic organization of the lexicon. In the case of bilingual acquisition, the structural consolidation of the first-language lexicon adversely impacts the representation and retrieval of the second-language lexicon, resulting in parasitic L2 representations due to reduced plasticity in the organization and reorganizational processes. These findings point to the developmental dynamics in which mechanisms of learning interact with the timing and history of learning to determine developmental trajectories. The actual maps constructed in these simulations directly illustrate the shapes of these competitions and lexical boundaries.

An important contribution of DEVLEX lies in the way that it illustrates the unsupervised emergence of part of speech categories. These categories must be available for additional systems that work on the learning of syntactic patterns. For example, if a word is located within the adjective space in the DEVLEX map, then it is a good candidate for use as an adjective in feature-based constructions that place the adjective before the noun. In this way, simulations of the emergence of the lexicon can feed directly in to simulations of the extractions of grammar.

Learning to use language in context: New models, new data

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Our overarching aim is to better understand how children learn to use language in context by gathering new kinds of observational data and developing mechanistic models that focus on the interaction of language use and the environment. This line of investigation began with the development of a robotic model that learns words from sights and sounds [1] which was shown to successfully learn from recordings of mother-infant interactions [2]. This work demonstrated the viability of a specific word learning strategy (based on cross-model mutual information) when applied to naturalistic child-directed recordings. Consequently, we developed richer models of situated language use that have led to an emerging theoretical framework for grounding semantics in perception and action [3-6]. Guided by this new approach to modeling meaning, we have returned our attention to gathering data of child-care giver interactions. The Human Speechome Project is a pilot effort to observe and computationally model the longitudinal language development of a single child using ultra-dense longitudinal recordings of audio and video in the home [7]. In the symposium, I will provide a progress report of this project and sketch our plans for analysis of the data in the context of our previous modeling and analysis efforts. I will also explore the potential of applying the Speechome tools and methodology for enabling further data gathering efforts.

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Simulating the developmental pattern of finiteness marking in Dutch, English, Spanish and German using MOSAIC

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One of the challenges facing computational approaches to language development is to develop models whose behaviour can be directly compared with that of language-learning children. Another is to show that these models can be extended beyond English-speaking children to simulate the behaviour of children learning a variety of different languages. MOSAIC (Model of Syntax Acquisition in Children) is a computational model of language acquisition that attempts to meet these challenges by using exactly the same learning mechanism to simulate the behaviour of children learning several different languages. MOSAIC takes as input corpora of orthographically-transcribed child-directed speech and learns to produce as output 'child-like' utterances that become progressively longer as learning proceeds As a result of these characteristics, MOSAIC can be used to generate corpora of utterances at different stages of development, and hence to model the behaviour of children learning different languages across a range of MLU values.

In this paper, we describe how MOSAIC has been used to simulate developmental changes in the cross-linguistic pattern of finiteness marking across 4 different languages.

In a first set of simulations we show how one identical version of MOSAIC is able to simulate developmental changes in the proportion of OI errors in Dutch, English, Spanish and German by learning to produce and generate from progressively longer utterance-final strings. More specifically, we show that MOSAIC is able to capture the initially high proportion of OI errors in OI languages such as English Dutch and German and the near absence of such errors in a non-OI language such as Spanish. We also show how MOSAIC is able to capture quantitative differences in the proportion of OI errors in two very similar languages (Dutch and German). Both of these effects are simulated as a result of the interaction between the model's right-edge learning mechanism and the relative frequency of finite and non-finite verb forms in utterance-final strings of increasing length in the input language.

In a second set of simulations we show how a new version of MOSAIC that learns from both edges of the utterance is able to simulate the developmental pattern of finiteness marking in both declaratives and Wh- questions. In particular, we show how MOSAIC is able to simulate differences in the proportion of OIs in Wh-questions in English and German as a result of the interaction between its edge-first learning mechanism and differences in the way Wh- questions are formed in these two languages.

These results suggest that it is possible to explain the cross-linguistic patterning of finiteness marking in terms of a resource-limited distributional analysis of the input language. They also illustrate how using computational modelling techniques to simulate corpora of child utterances can provide important insights into the factors that shape children's early multi-word speech.

A scalable computational approach to grammar discovery from CHILDES data

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In language, like in any other cognitive domain, learning is made possible by regularities in the primary data, which contain cues to the processes that generate them. These processes include each interlocutor's knowledge of language (the "grammar"), as well as various interactions: between language and the rest of the person's cognitive system, and between the cognitive system and the rest of the world, including other individuals.

Our current efforts in computational grammar discovery aim to develop algorithms capable of learning high-performance grammars from raw, unannotated text corpus data. Any unsupervised learning algorithm must rely on some assumptions about the nature of the regularities it seeks; ours look in the corpus for statistically significant occurrences of collocations and dependencies (that is, syntagmatic regularities) and of distributional equivalences (paradigmatic regularities). The learning process is thus biased to discover lexicalized probabilistic context-free or context-sensitive "rules" that combine syntactic and semantic information, are language-specific, and depend on the particulars of the training corpus. The performance of the resulting construction grammar is assessed by precision and recall (measuring, respectively, its coverage of a withheld portion of the corpus, and the acceptability of novel utterances that it generates), by test set perplexity (measuring the grammar's predictive power), and, more generally, by the degree of fit between the probability distribution that the grammar induces over test utterances and an estimate of their true probabilities in the linguistic environment.

The ADIOS algorithm (Solan, Horn, Ruppin, and Edelman, 2005) was the first to exhibit high precision and recall and low perplexity when trained and tested on the ATIS benchmarks for unsupervised learning.
Notably, ADIOS achieved precision of 0.63 and recall of 0.50 when trained on a 300,000-sentence portion of the English CHILDES corpus (parents' speech). Similar results were attained for portions of the French CHILDES, for which the performance was boosted by preprocessing it with Goldsmith's morphology learning algorithm, Linguistica. ADIOS performed comparably also when trained on two small Mandarin CHILDEScorpora.

A new algorithm, ConText, which combines distributional clustering of lexical and phrasal elements with probabilistic constraints on generalization, outperforms ADIOS on corpora generated by artificial grammars, which include both simple and clausally complex sentences; it is now being tested on CHILDES. In parallel with pursuing this and other promising algorithmic approaches, we are presently exploring a novel method for estimating precision that dispenses with the need for human judgments of grammaticality. Our short-term goals include (1) developing a principled, comprehensive framework for automated testing of unsupervised grammar acquisition algorithms, (2) constructing a cognitive model based on the new algorithms and on insights from developmental psycholinguistics, in particular the demonstrable importance of variation sets in L1 acquisition, and (3) testing the behavioral predictions of the model, both in its "child" and "adult" stages. In the longer run, we plan to extend the model to address some of the multimodal, embodied, and interactive aspects of real-world language acquisition.

Bayesian inference of structural dependency

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The Poverty of the Stimulus argument holds that children do not receive enough evidence to infer the existence of core aspects of language, such as the dependence of linguistic rules on (recursively generated) hierarchical phrase structure. We use a Bayesian model of grammar induction to reevaluate one version of this argument and show that a rational learner without any initial biases could in fact learn this dependency from typical child-directed input.

One common version of Poverty of the Stimulus argument concerns the phenomenon of auxiliary fronting in English interrogative sentences. Chomsky (1965, 1971) suggested that typical linguistic input is consistent with both structure-independent and structure-dependent hypothesis rules for auxiliary fronting, but children hear few sentences indicating that the structure-independent rule is incorrect. Because of this lack, children should favor the a priori simpler structure-independent rule; since they do not (Crain & Nakayama 1987), they must innately know that language is hierarchically structured.

Many argue that Chomsky's conclusion is unwarranted because language contains enough distributional information for children to realize that sentences consistent with structure-independent rules are incorrect (Lewis & Elman 2001, Reali & Christiansen 2005).

However, these criticisms do not presume the existence of explicit structured linguistic representations, and therefore they do not address the central question of whether the hierarchical and phrasal structure of language is learnable. We address this question by presenting typical child-directed input to an ideal learner that is equipped with the capacity to explicitly represent both structure-independent and structure-dependent grammars, but has no initial biases.

Our model assumes that linguistic data is generated by first picking a type of grammar T, then a specific grammar G as an instance of that type from which the data D is generated. The three possible grammar types include three structure-independent types (regular grammars, a memorized list of all sentences, and a grammar accepting any sequence of words) as well as one structure-dependent type (context-free grammars with recursion). Inferences about the specific grammar and grammar type are described using Bayes' rule, which combines the prior probability of G and T with the likelihood that they generated the data (the Adam corpus in CHILDES).

The model infers that the structure-dependent grammar is a better fit to child-directed English input; this is because structure-independent grammars, though a priori simpler, are also less expressive. A context-free grammar that matches a given natural language corpus will thus be both smaller and more capable of correctly generalizing to new sentences than either structure-independent grammar (in part because of its recursive elements). As a result, unlike the structure-dependent grammars, the context-free grammar preferred by the model can master subtle aspects of syntax, such as the auxiliary fronting rule in interrogative formation, even without having heard directly relevant data.

Symposium Session 7 - Thursday 31 July 11.00 - 13.00
Symposium Number – S7-1

Chair: Agnès Lacroix, *Laboratoire LMDC (CNRS UMR 6215)*
Discussant: Agnès Lacroix, *Laboratoire LMDC (CNRS UMR 6215)*

Individual differences and heterogeneity of the language profile in Williams syndrome

Description:
Williams syndrome (WS) is a rare genetic disorder involving the deletion of approximately 27 genes on the locus 7q11.23. Work over the last twenty years has focused on delineating the distinctive neurocognitive profile that characterizes this group. The first studies identified a dissociation between cognition and language demonstrating that the verbal performance of individuals with WS was markedly better than their performance in non-verbal areas. More recent studies have shown dissociations within language (e.g., relatively good phonological memory, impaired grammatical morphology) and within non-linguistic visuo-spatial skills (good face recognition, impaired block design). At the same time with data from larger groups of individuals with WS, it has become apparent that there is heterogeneity in performance within the WS group. The purpose of our symposium “Individual differences and heterogeneity of the language profile in Williams syndrome” is to explore this heterogeneity in more detail within the context of different languages and cultures. The five individual papers explore language performance and related abilities in individuals with WS from: French, Hungarian, Spanish and English. The first paper will look at morphosyntax and non-verbal abilities; they will show that while some areas of language abilities of the WS group are impaired, they do well compared to children with Down Syndrome, and show better lexical than morphosyntactic performance. Differences will be discussed with reference to the differential effects of non-verbal ability, age and gender on performance and in profiling language abilities. To begin to identify sources of variation in language performance, the second symposium paper will investigate performance on two grammatical tasks and their relationship to individual measures of vocabulary size (PPVT), phonological short-term memory (nonword- and digit span), and Corsi-span in Hungarian children. Phonological short-term memory and vocabulary size appear to influence grammatical proficiency. The third paper looks at language and spatial cognition from a constructive discourse perspective. While Spanish speaking WS subjects have no problems with spatial language, they do exhibit difficulties in constructing a narration from a model, similar to the block construction test (non-verbal task). Thus, for Spanish, it is constructive language, not spatial language that is impaired in WS.To further understand the heterogeneity of performances in WS, the fourth paper focuses on the role of language and culture. Comparing French and English speaking children with WS, heterogeneity in language proficiency and use is differentially observed in narratives produced by children with WS.Finally, the fifth paper will explore a less researched language domain: prosodic skills. They investigate the development of expressive and receptive prosodic abilities in English speaking children with WS. Results suggest that intonation skills in WS may follow an atypical trajectory characterized by a delayed rate, onset and often a premature plateau.By looking at heterogeneity in language in WS from different language communities and approaching the phenomenon from multiple perspectives, we can begin to identify factors mediating their performance. Thus, we will have a better understanding of underlying processes involved in the language profile in a disorder such as WS and of the role of external factors on language development.

Profiling the language abilities of individuals with Williams Syndrome

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Background: The paper profiles the verbal and non-verbal abilities of individuals with Williams Syndrome (WS) to explore the debates surrounding the language functioning of this population and the controversial claims that the WS profile supports dissociations between language and cognition and within language, thereby supporting modularity (Fodor, 1983).

Research indicates that individuals with WS have strengths in language relative to non-verbal performance, with claims being made for ‘intact’ language processing and better performance in grammatical versus semantic processing (Bellugi & al., 1993). Studies have shown that WS individuals perform well on syntactic tasks (binding, passives), and perform better on regular than irregular past tense and plurals (Clahsen & Almazan, 1998; 2001). However, this view has been challenged with others reporting great variability in their linguistic performance and poor performance in morphosyntax (Joffe & Varlokosta, 2007; Stojanovik & al., 2004).

Aims: This study investigates the verbal and non-verbal abilities of 30 individuals with WS (age range: 4; 6 - 44; 3 years; mean: 17; 9 years). Performance is compared with two comparison groups: individuals with DS (age range: 5.11 - 41; 3 years; mean: 13; 1 years); and a younger (TD) group (age range: 3; 3 - 8; 10 years; mean 5; 1 years).

Method: Standardised assessments of non-verbal ability, receptive and expressive language and non-word repetition were given. Non-standardised tasks explored: (a) comprehension, production and repetition of regular and irregular past tense and plurals; (b) comprehension, production and repetition of wh-questions; and (c) the understanding of passives.

Results/discussion: Individuals with WS showed significant impairments in language ability, with enhanced performance in lexical versus grammatical processing. They performed better in areas of language compared to the DS group (for e.g. receptive and expressive vocabulary, receptive grammar, plurals, past tense, passives and wh-questions) and performed similarly to the TD group. There was also greater variability in language performance in the WS group.

Conclusions: Thus whilst the language abilities of the WS group were found to be impaired, they did show areas of enhanced language compared to the DS group. Implications of these differences are discussed with reference to the nature of both conditions and modularity. The differential effects of non-verbal ability, age and gender are discussed with regards to profiling of language abilities.

Grammatical abilities in Williams syndrome: Individual differences and their sources

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Background: Populations with developmental disorders usually show great individual variation in performance on cognitive tasks. Even the Williams syndrome (WS) phenotype with superiority of verbal over nonverbal abilities has only been found at the group level. Examination of individuals revealed that this large discrepancy is not observed in every case, but mainly in more able individuals: the better the verbal abilities of an individual, the larger the discrepancy between his/her verbal and nonverbal abilities (Jarrold & al., 1998; 2001). Huge individual differences in grammatical performance in Williams syndrome have already been documented, but the sources of this variation are yet unclear.

Aims: We examined the relationship of performance on two grammatical tasks and their relationship to individual measures of vocabulary size (PPVT), phonological short-term memory (nonword- and digit span), Corsi-span and age in a group of Hungarian WS individuals (mean age: 14;1; range: 7;4-19;0) and in typically developing children matched on vocabulary size (mean age: 6;10, range: 6;0-8;6). The two grammatical tasks included an elicited production of regular and irregular inflection, and a grammaticality judgment task with five different types of violations.

Results: Individual variability is greater in the WS group for both tasks. In the grammaticality judgment task WS variability was greatest for morphological and phonological violations, while the control group's performance displayed largest individual differences on sentences with syntactic and phonological violations. A measure of phonological short term memory, digit span, seemed to be a significant determinant of morphological performance even after controlling for chronological age. We found a significant relationship between vocabulary size and performance on the tasks too. Interestingly enough, we found a significant relationship between Corsi span and morphological performance as well. In the grammaticality judgment task, we found that participants with WS with lower verbal ages have greater difficulty detecting violations, and as verbal age increases, performance approaches ceiling in the WS group as well. Overall performance was correlated with both chronological and verbal age in the WS and the VC groups as well (all correlations were significant at $p<0.05$). No correlations with these two measures with specific violation types was found in the control group. While such correlations in the WS group were significant, controlling for age left partial correlations with verbal age significant only with performance on sentences containing semantic violations.

Conclusion: These findings confirm that phonological short-term memory and vocabulary size seem to play an important role in grammatical development. This relationship is similar to (although at the same time stronger than) that observed in the verbal control group of younger typically developing children.

In search of grammatical and narrative correlates of spatial cognition deficits in Williams syndrome

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Background: The first reports on WS revealed the apparent dissociation between spatial cognition and linguistic competence. Soon it was shown that spatial cognition was not so impaired and language so was not that spared. Within a cognitive hypothesis, the so-called 'spatial language' was investigated in search of correlates for spatial cognitive difficulties. However, the concepts of spatial cognition and spatial language have proved to be too broad. Tasks evaluating competences in these areas imply quite complex and diverse abilities, which do not allow for a straightforward comparison.

Aims: Our research compares the performance of 12 Spanish-speaking WS subjects in a non-verbal task in order to evaluate their spatial cognition, with their performance in a verbal task to assess their ability to grammatically express spatial relations and to reconstruct the spatio-temporal structure of a narration. Our hypothesis is that WS subjects may not have particular difficulties when grammatically encoding the observed spatial relations, but they would have difficulties when reconstructing the narration from a model, a task that would more closely resemble the block construction test.

Methods: The non-verbal task used to assess spatial cognition was the "Block design" test from the Wechsler Intelligence Scales. Subjects were videotaped while attempting to solve the block construction task, therefore we could not only obtain their scores, but we could also analyse the way in which the task was performed. Subjects were also tested for the rest of the non-verbal scales, so we obtained their performance IQ.

In order to evaluate their grammatical and narrative abilities, we used the silent film "Frog goes to dinner", which WS subjects watched on video, and next they were asked to narrate it to the researcher. Recordings were transcribed using the tools provided by the CHILDES project and spatial prepositions as well as other grammatical and semantic elements with spatial reference were codified. Different levels of the narrative structure such as reference to scenes (basic level), episodes (intermediate level) and events (complex level) were also codified. Finally, discourse markers used to link narration events were codified.

Results: Our results indicate remarkable individual differences in performance intelligence, and particularly in the block construction test, whose performance was in any case impaired. In contrast, in the narrative task, no striking shortcomings were found concerning spatial grammatical reference, which did not differ from the use of non-spatial language. The robustness of the linguistic system is also reflected in the use of markers to introduce narration events, although a disproportionate use of discourse starting markers was observed. This suggests a certain difficulty in the progression of the narrative task. This difficulty clearly appeared when organizing the narration structure sequentially, task in which all the WS subjects showed difficulties at every level.

Discussion: In our view, if a correlate of the WS spatial cognitive difficulties is to be found, it would not lie in an alleged spatial language, which these subjects use in an automatic, immediate and correct way, but rather in tasks requiring planning and construction of the different parts of the discourse.

Williams syndrome and heterogeneity of performances in narratives: A cross-cultural perspective

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Background: Williams Syndrome is a genetically based disorder resulting from a micro deletion of more than 20 genes at 7.11q23. Research over the last 20 years on WS has focused on characterizing the WS phenotype. Whereas studies have amply demonstrated a characteristic neuropsychological profile in WS, it has become increasingly clear that there is also heterogeneity within the WS group. Research on narratives and WS has been conducted in a variety of languages, and although commonalities are evident, studies show that performance in different aspects vary by language and culture.

Aims: This study is designed to investigate the heterogeneity in language proficiency and performance as observed in narratives produced by French and English speaking children with Williams syndrome (WS) aged between 5 and 12 years.

Method: To explore and understand potential differences, we compared performance of 10 French-speaking children with WS and 35 American English-speaking children with WS aged between 5 and 12 years. Children were asked to tell the story « Frog, Where are you? » (Mayer 1969). Narratives from the WS children were compared to those of typical children with the same chronological age (CA) and of typical children with the same mental age (MA). Stories were transcribed using CHILDES and coded. In the narratives, we explored six indices: (1) length: number of propositions, (2) frequency and type of morphosyntactic errors, (3) frequency and type of complex sentences, (4) narrative structure, (5) use of social evaluative language and (6) spatial language.

Results: Rather than using only quantitative analyses, we also will present a qualitative analysis. First, we observe a heterogeneity in the French-speaking children with WS performances for the use of social evaluative language, but to a much lesser degree for the frequency and type of morphosyntactic errors. In contrast, for the English-speaking children with WS, the greater heterogeneity of performance concerns the frequency and type of morphosyntactic errors and the performance for the use of social evaluative language is more homogeneous. Unlike controls, where chronological age predicts performance in these domains, in neither English nor French does WS performance correlate with chronological age. Second, for both English and French, spatial terms present a challenge with more heterogeneity in the English-speaking group. Lastly, in French, for complex syntax, WS performance is comparable the MA group. Notably, both WS groups use significantly more social evaluative language than their either CA or MA controls.

Conclusion: These results indicate that the performances of WS group (1) are heterogeneous in French and in English, and (2) heterogeneity occurs in different aspects of narrative in French and in English. Discussion will focus on heterogeneity within the WS group as well as possible explanations between differential performance of WS in French and English.

Development of prosodic abilities in children with Williams syndrome

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Background: Despite ample research into linguistic aspects of Williams syndrome (WS), little is known about the development of prosodic skills in this population. Research has shown that children with WS have prosodic skills similar to children of the same level of receptive language abilities. In spontaneous speech, children with WS have been reported to use a significantly wider pitch range and are perceived by phonetically naïve listeners as being twice as much emotionally involved when compared to typically developing (TD) children. It is not known, however, how prosodic abilities in WS develop over time, which is a crucial issue in the debate regarding whether cognitive skills in WS follow an atypical trajectory (Karmiloff-Smith, 1998).

Aim: This is the first study to investigate the developmental trajectories for expressive and receptive prosodic abilities in a group of English speaking children with WS in order to address the issue of whether these prosodic skills develop atypically in WS.

Method: Twenty children with WS (mean age 116 months, range 72 to 167 months) and forty controls (mean age 93 months, range 51-148 months) were compared on a range of receptive and expressive intonation tasks from the Profiling Elements of Prosodic Systems- Children's version (PEPS-C) battery (Peppe, Gibon & McCann, 2003) and in spontaneous speech using the Frog Story. The PEPS-C battery consists of two form and four function tasks all of which have input and output counterparts. The form tasks assess discrimination and imitation (input and output domains respectively) of intonation and prosody patterns involved in the function tasks above using short and long prosodic domains. Each task had 16 items. In the input form tasks, participants hear pairs of prosodic patterns without lexical information and are asked to say whether they were the same or different (discrimination). In the output tasks, participants are required to imitate the speaker. The function tasks include: turn- end (understanding and producing questioning versus declarative intonation); chunking (perceiving and producing syntactic groupings in speech and disambiguating phrases using prosody); focus (understanding and producing what is being emphasized in a phrase) and affect (understanding and producing likes versus dislikes).

Results: Statistical analyses showed a strongly significant relationship between chronological age (CA) and all aspects of intonation tested (both form and function) for the TD group. The WS group, on the other hand, was very different in that there were no significant relationships between chronological age and any aspect of intonation tested. The results were similar in the spontaneous speech task as well with regard to pitch range and vowel length, i.e. CA strongly predicted pitch range and vowel length in the TD group but not in the WS group.

Conclusion: These results suggest that intonation skills in WS follow an atypical trajectory characterized by a delayed rate, onset and often a premature plateau.

Symposium Session 7 - Thursday 31 July 11.00 - 13.00
Symposium Number – S7-2

Chair: Dagmar Bittner, *Centre for General Linguistics (ZAS)*
Discussant: Natalia Gagarina, *Centre for General Linguistics (ZAS)*

Intersentential pronominal reference in L1-acquisition

Description:

The resolution of intersentential pronominal anaphora has become a much discussed topic in different theoretical approaches, such as the functional grammar of Givón, research on accessibility hierarchies, centering theory, bidirectional optimality theory, and the theory of generalized conversational implicatures, among others; not to forget the developments in computational linguistics and information theory. There is a hot debate on the set of factors guiding the resolution of anaphora and on how the various criteria interact with each other. One of the central notions in this debate is antecedent salience. Although salience is considered the most important criterion since Lewis (1970, 1978), there is no common understanding on how salience or different degrees of salience are inferred from the given linguistic data by the language user. Given this situation, the investigation of the language acquisition process appears to be of special importance. It provides the opportunity to go back to less complex stages of language processing. The early phases of language acquisition might provide insights, for instance, in what are primary and what are merely secondary features in salience determination or in what are primary anaphoric capacities of the different types of anaphora. Later phases and developmental steps can highlight the (re)organization of the complex anaphoric system. Further, it is worth noting that the acquisition of intersentential anaphoric relations is a milestone in gaining command of text/discourse structure and, thus, is a prerequisite for successful participation in school education. However, after a short research period in the 1970s and 1980s, the acquisition of intersentential anaphoric relations has been nearly ignored in acquisition research. The symposium aims at highlighting the onset of a new research area in language acquisition and the questions addressed in this field. Special focus is given to the following topics:

1. Which hypotheses concerning the emergence and development of intersentential pronominal anaphora resolution in child language can be derived from the discussion of linguistic theory?
2. What are current findings of language acquisition research on the role of the following properties of antecedents: subject, topic, animacy, parallel syntactic function, distance in the discourse, for the determination of salience (or, say, the choice of an antecedent for a pronominal anaphor). Is salience the most decisive notion in determining what form will be used?

3. Which other criteria may emerge early in the acquisition process? Excepting semantic inferences, what is the impact of semantic and grammatical features of linguistic elements not belonging to the noun phrase?
4. When and for which types of anaphoric relations do children obey the iconic relationship assumed between salience of the antecedent and the structural complexity of the pronominal anaphora (i.e., zero pronouns vs. personal pronouns vs. demonstrative pronouns, etc.)?
5. What are modes of expression of anaphoric relations in different types of texts (and in different types of production and comprehension experiments)?
6. Finally, are there typological properties of languages that may result in cross-linguistic differences in the resolution of intersentential pronominal anaphora? If so, which differences can be hypothesized?

Resolution of intersentential pronouns in German, Russian, and Bulgarian

Dagmar Bittner, Natalia Gagarina, Milena Kuehnast
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By contrasting data from German, Bulgarian, and Russian, we investigate the comprehension of intersentential zero, personal, and demonstrative pronouns and their anaphoric oppositions. It has been assumed that anaphora resolution is based on a reversed mapping of antecedent salience and anaphora complexity: minimal complex anaphora refer to maximal salient antecedents (e.g., Givón 1983; Levinson 2000; Gundel et al. 1993). Thus, we ask whether and at which age children apply the "reversed-mapping-principle" when confronted with the following semantic and syntactic cues for antecedent saliency: syntactic role, animacy, word order, agentivity, topicality.

We conducted two experiments of the same type: At the very end of a three-to-four-sentence story about two protagonists - acted out with toy puppets by the experimenter in front of the child - the child heard an ambiguous sentence containing a pronominal subject, e.g., *he is white* or *this one laughs loudly*. This sentence was true for both protagonists; no gender, semantic or other cues were provided which could be used to disambiguate pronominal reference. The child had to repeat this last sentence in response to a question of a distracted puppet asking what had just been said. After repetition by the child, the puppet asked who (was white or laughing loudly). The first experiment varied syntactic role (subject/object) and in/animacy of the protagonists. The second experiment varied word order, topicality and agentivity. 180 children, age 2;6 to 5;6, plus an adult control group have been tested for each language. The data were analysed for three age-matched groups (3;0, 4;0, 5;0). Analyses of three language-proficiency-matched groups (comprehension of verbs and prepositions; Siegmüller & Kauschke, 2006) are in preparation and will be presented in case of relevant findings.

The age-matched results are: Animacy, syntactic role and agentivity had the strongest impact on pronoun resolution. Word order did not appear to be relevant. The 3- and 4-year-olds did not show significant oppositions between pronoun types; antecedent choice was at chance level with respect to all criteria. However, there are tendencies to prefer the animate and/or most agentive protagonist. In the 4-year-olds, syntactic role and agentivity become more relevant and children show tendencies to oppose either the zero (Russian, German) and/or the demonstrative (Bulgarian, Russian) to the personal pronoun. The 5-year-olds show significant opposition of personal and demonstrative pronoun; the former resolved to animate subjects and the latter to animate objects. Agentivity is used as a further but less important cue. Influence of language-specific structure of the pronoun system comes to light by, e.g., different treatment of zero and demonstrative pronoun. In German, ungrammaticality of zero pronoun leads to chance performance in the oldest children, whereas the younger children try to integrate this form in the pronoun system. In Russian and Bulgarian, demonstrative pronoun use is restricted to very specific contexts; children, nevertheless, oppose the demonstrative to the other pronoun types. The results indicate that children acquire anaphoric oppositions of pronouns around age 5;0 and that they use the reversed-mapping-principle in pronoun resolution.

Verb semantics affects children's pronoun comprehension: Evidence from eye-movements

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Online studies of pronoun comprehension have revealed that children tend to treat pronouns as co-referential with the subject (and first-mentioned referent) in the prior linguistic context (Song & Fisher, 2006). The current study aimed to add to our understanding of the factors that affect children's processing of temporarily ambiguous pronouns. It investigated whether, in addition to syntactic information, verb semantics might also affect children's pronoun comprehension. One type of semantic information that very young children might be sensitive to is that of verb transitivity (Dowty, 1991). Highly transitive verbs (e.g. *hit*) have prototypical agents and patients, whereas low transitivity verbs (e.g. *see*) have less active, causal agents and less affected patients. Such differences in verb semantics might affect children's pronoun comprehension.

We selected 30 transitive verbs from the CHILDES corpus and had them rated for transitivity by 20 undergradute psychology students (Kako, 2006). We took as stimuli the 10 verbs with the highest ratings (high-transitivity verbs: *fed*, *pinched*, *phoned*, *cuddled*, *squashed*, *kissed*, *squeezed*, *kicked*, *banged*, *hit*) and 10 with the lowest ratings (low-transitivity verbs: *bumped*, *teased*, *found*, *loved*, *hated*, *ignored*, *liked*, *heard*, *lost*, *saw*). Fifteen three-year-olds participated in a visual-world study in which they looked at a screen, presenting two characters and a location (figure 1), while listening to corresponding four-sentence stories of the following form: 1. *The X [verb]ed the Y near the [location]*. 2. *Do you know what happened next?* 3. *He did something very silly*. 4. *He [verb]ed*. The verb in the first sentence was either high or low transitive. Children's eye movements for each 40-millisecond frame following the onset of the pronoun 'he' in sentence 3 were coded as looking to the subject (of sentence 1), the object or the location. The number of looks to each area was counted for six consecutive 520 milliseconds time-bands. Children were significantly more likely to look to both the subject and the object of the first sentence if the verb had been highly transitive. This effect was significant from 520 to 2600ms after pronoun onset. There was also a significant preference for looking at the subject of the verb, although this effect occurred later (between 2080 and 3120ms after pronoun onset). There were no reliable interactions between transitivity and grammatical role, indicating that the subject preference was not modified by verb transitivity.

We conclude that children had stronger expectations about both referents in the high-transitivity condition. This finding accords with accounts that explain pronoun comprehension in terms of assumptions about the causes and consequences of events and the expectations these generate about how a discourse will unfold (Crinean & Garnham, 2006). Higher transitivity verbs depict events that have more powerful causes and consequences and, thus, create greater expectations, which stimulate increased looking behaviour. The fact that the effect of verb semantics arose quickly suggests that, like adults, children rapidly generate expectations about the upcoming discourse (Koornneef & Van Berkum, 2006).

Figure 1. Example stimulus picture.

Two-year-old's use of pronouns for different degrees of givenness in discourse

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Referring expressions are restricted by the referent's givenness to speaker and listener: The more *in focus* the referent, the more appropriate it is to use a pronoun (Gundel et al. 1996). Factors that influence givenness are, amongst others, physical presence or discourse presence of the referent. This paper focuses on the second factor. For example, in English, successive reference to the same entity is most often achieved with personal pronouns (*That's Bear. He$_i$ is brown*). The use of nouns in this context creates an effect of overexplicitness (*That's Bear$_i$. ? The bear$_i$ is brown*). However, if the distance between the two elements of an anaphoric relation gets larger, nominal forms are equally appropriate or even better than pronouns.

Children must learn to linguistically differ between new, given, and different *degrees* of givenness. Research has shown that before 2;0 children have developed the necessary socio-cognitive concepts to distinguish between what is new and given to themselves and others (Tomasello & Haberl, 2003). Moreover, from 2;0 onwards French children make this difference linguistically by means of indefinite and definite nouns (Rozendaal & Baker, submitted). It is, however, not known if and how young children (around 2;0) differ between degrees of givenness in intersentential pronominal reference. This paper aims to fill this gap by investigating (1) if children's use of pronouns, nouns and proper names is influenced by the distance between an anaphor and its antecedent in discourse and (2) if children are influenced by typological properties of the language in choosing a pronominal form for anaphoric referents.

Person / object reference is analyzed in longitudinal conversational data from three Dutch and four French children (2;0-3;3, CHILDES) in three-monthly intervals. A small sample of input language was also analyzed. The use of nouns, proper names and pronouns, (subdivided into personal, demonstrative and 'other') was analyzed according to whether the referent was (a) given in discourse and similar to the immediately previous referent (*maintenance*, small distance) or (b) given but different from the immediately previous referent (*shift*, larger distance).

In both languages, the children show an adult-like pattern of using pronouns, nouns and proper names with respect to discourse distance from 2;6 onwards. That is, if the distance between antecedents is small (maintenance), pronouns are used in 60%-85% of the cases. If the distance is larger (shift), pronouns and nouns are used to similar extents, around 45%. Furthermore, proper names are significantly more often used with larger distance between anaphor and antecedent (shift: 10%-20%). There is also evidence for early cross-linguistic differences. The Dutch adults and children use more demonstrative pronouns than personal pronouns in maintenance and shift. French adults and children show the reverse pattern: they prefer personal pronouns.

The results indicate that the morphosyntax-pragmatics interface, in terms of sensitivity to degrees of givenness in discourse, develops between 2;0 and 2;6. Moreover, language-specific patterns from the input have an early influence on the forms that children use for intersentential pronominal reference.

Informativeness, cognitive status, and young children's use of pronominal forms in spontaneous conversation

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A characteristic, and probably unique, feature of human language is that same entity can be referred to in many different ways. The particular form that a speaker/writer uses is at least partly constrained by her assessment of the addressee's knowledge and attention state with respect to the intended referent. Gundel, Hedberg, and Zacharski (1988, 1989, 1993, and subsequent work) take this observation one step further by proposing that individual lexical items, specifically determiners and pronouns, conventionally encode information about the cognitive status of the intended interpretation in the mind of the addressee. The relevant statuses comprise the following 'Givenness Hierarchy', where each status entails all lower statuses: in focus > activated > familiar > uniquely identifiable > referential > type identifiable.

Assuming the Givenness Hierarchy framework, the present paper reports on a study of the use of personal, zero, and demonstrative pronouns in conversational data from English speaking children aged 1;10-2;8 (Valian 1991). Our investigation corroborates results from earlier studies (Gundel and Page 1998, Gundel, Ntelitheos and Kowalsky 2007, Bittner 2002, Wittek and Tomasello 2005, among others) which indicate that pronouns are among the earliest referring forms used by children and that they are used correctly by age 2, and in some cases earlier. We find that before age 3 children are able to appropriately distinguish between unstressed personal pronouns and zero, which require their referents to be in the addressee's focus of attention, and demonstrative pronouns, which only require activation (i.e. awareness/perceptual availability). The primary difference between children under three and older than three is that the younger children are less sensitive to providing too little or too much information about cognitive status. Thus, they tend to 'overuse' demonstrative pronouns for referents that are in focus. While such uses are technically 'correct', since anything in focus is also activated, they are less informative (and thereby also less restrictive) than they could be about the cognitive status of the referent. These findings are also consistent with studies that find younger children to be less sensitive to quantity implicatures (e.g. Noveck 2001, Verbuk 2007). They suggest an explanation for results reported in Mathews, Lieven, Theakston, and Tomasello 2006 who found that 2-year-olds, unlike 3- and 4-year olds, did not use significantly fewer nouns (vs. pronouns) when the referent was just mentioned in the discourse or perceptually available in the extralinguistic context. As with the use of demonstrative pronouns for in focus referents, the children were still using the nouns correctly, since bare nouns and nouns with an indefinite article are consistent with all statuses; but they were providing more information than necessary, in this case about the conceptual properties of the referent. Thus, while it appears that 2-year old children can assess when an entity is in focus, activated, or familiar for their interlocutors, they have not yet developed more conscious 'mind-reading' abilities that allow them to determine how much conceptual or cognitive status information is enough.

Acquisition of pronouns in Norwegian: A case study

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This paper presents analyzes from a study of one Norwegian child's production of pro/nominal forms from birth until the age of 3;3, primarily based on diary notes. The paper investigates whether the child's early appropriate uses of pronouns is likely or not to be due to knowledge about cognitive status, in the sense of Gundel et al. (1993).

At the age of 2;9, Johannes (a late speaker) produces the following nominal forms, observed in the given order: 1) bare nouns/proper names; 2) proximal demonstrative pronoun; 3) distal demonstrative pronoun (or personal pronoun); 4) nouns with a definite suffix (only a set of restricted nouns); 5) demonstrative determiners; 6) the determiner *two*; 7) 1st p. pronoun; 8) 2nd p. pronoun; 9) 1st p. possessive; and 10) 2nd p. possessive. Johannes does not follow the acquisition order reported for English and Spanish children by Gundel et al. (2007), since he produced the demonstrative pronoun prior to the personal pronoun, and due to sporadic early use of the suffixed determiner.

Johannes' first sequences of coreferential nominals are part of the same sentence, as in (2c). The first secure occurrence of an intersententential (non-deictic) anaphoric pronoun appears at 2;8, with a non-pronominal antecedent, given in (1).

(1) Molmol læli lallo? Molmol læli dén?
Grandma' finished phone? Grandma' finished that?
('Is Grandma' finished with the phone? Is Grandma' finished with it?')

Johannes mostly uses pronouns appropriately, but there are three systematic misuses exemplified in (2): When asked to repeat words he cannot pronounce, he often uses a deictic demonstrative; before acquiring the 1st p. pronoun, he uses the proximal demonstrative to refer to himself; and until the age of 2;8, he often duplicates the topic of his utterance.

(2) a. Mother: Kan du si *Trude*? ('Can you say *Trude*?')
Johannes: *(pointing)* Dén! ('That!')
b. *(Johannes knocks himself on the chest:)*
Denna ut! ('This out!') (= I want to go out!)
c. Den låne mamma den.
'that borrow mummy that' (= Mummy can borrow that.)

Whereas misuses of these types were relatively frequent, only a couple of cases are noted where Johannes uses a pronoun to refer to something that does not have the required cognitive status. This is compatible with Gundel et al.'s (2007) conclusion that cognitive status is a notion which early determines pronoun production. An alternative hypothesis is that Johannes' early appropriate use of pronouns wrt cognitive status follows from a general competence on deictic use, in combination with a simplistic ordering rule of nominal forms. Among pronominal pairs, only the orderings *denna-denna* (this-this), *den-den* (it/that-it/that), and *denna-den* (this-that/it), appear in Johannes' speech by age 2;9, never *den-denna* (that/it-this), which is in accordance with adult language in two-sentence utterances. Thus, one restriction on pronominal form might be: never *den* before *denna.* If this rule is correct, it is expected that Johannes will make mistakes later with longer discourses, where the distance between pronoun and antecedent is longer and the suggested rule too simple.

Symposium Session 7 - Thursday 31 July 11.00 - 13.00
Symposium Number – S7-3

Chair: Cassandra Foursha-Stevenson, *Mount Royal College*
Discussant: Fred Genesee, *McGill University*

Why say, *the car green*: Morphosyntactic cross-linguistic transfer in bilingual children

Description:
Bilingual children sometimes use a construction in one language that seems to be based on a construction in their other language. For example, French-English bilingual children might say "The car green" in English based on adjective-noun order in French. This phenomenon has been referred to as cross-linguistic transfer. Several possible explanations for cross-linguistic transfer have been proposed, including the three mentioned here. Cross-linguistic transfer may result from bilingual children's greater proficiency, dominance, or attrition in one language over another; if so, then bilingual children may show more evidence of transfer in their weaker language than their stronger. Alternatively, a language may be susceptible to transfer in areas of structural ambiguity or more specifically at the pragmatic-syntax level of representation. Therefore, languages with competing constructions may show more evidence of transfer than those that are more rigid. Finally, transfer could be the result of the interference between the two linguistic systems while in the process of speech production; multiple competing structures are activated creating competition resulting in transfer. The papers presented in this symposium discuss current evidence for cross-linguistic transfer at the morphosyntactic level in bilingual children and address possible explanations for the transfer.

Morphosyntactic attrition in the L1 of children who are sequential bilinguals

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In this longitudinal study, we examine the development of negative sentences, negative polarity items (NPI) and interrogatives in the L1 and the L2 of Spanish-English bilingual children learning English as a second language (ages 5;09 to 9;00 at the time of the first recording). In particular, we focus on the possible effects of attrition or arrested development on these structures in Spanish in order to determine whether bilingual children who are acquiring the L2 sequentially in a subtractive bilingual environment show attrition in the +interpretable features of their L1, as do adult near-native speakers (Sorace 2000).

Studies of the development of English negation and interrogation in adult L2 learners have shown that *do-insertion* and the lower positioning of the verb in English (1a,b) are difficult to acquire (Hawkins 2001). L1 speakers of Spanish, a language with verb movement (Suñer 1999, Toribio 2000), no *do-insertion* and null and post-verbal subjects (2a, b) (with the exception of Caribbean varieties (2c)), experience difficulties in the development of target-like representations of L2 English in these areas (Schuman 1974).

(1) a. What do you eat?
(1) b. I do not eat cake
Neg eat-1sg cake

(2) a. ¿Qué comes (tú)?
What eat-2sg (you)
(2) b. No como pastel
(2) c. ¿Qué tú comes ?
What you eat-2sg

Negative polarity items (NPI) are also difficult for L2 learners of English because in Spanish they require c-command by pre-verbal negation, as seen in (3b):

(3)a. He has no idea
Neg has-3sg any/*no idea
b. No tiene ninguna/ *no idea

We report the results of three sessions recorded at 6 months intervals. 23 students (6 Caribbean) were interviewed in the first session; out of this group, 15 students were interviewed in the second session (2 Caribbean), and 22 (6 Caribbean) in the third one. The children performed oral production tasks elicited using interactive puppet shows in both English and Spanish. Results indicate an increase in the

use of *do-insertion* in English negation across sessions (69%, 72%, 86.96%) although in the third session, 48% of the children's utterances lacked subject agreement on *do*:

(4) Her/ he don't like*s* bread

There was also an increase in correct English NPIs (52%, 57% and 78.26%) and interrogatives (41%, 31% and 56.52%). In Spanish, negative sentences were produced correctly in all three sessions (72%, 71%, 73%). Incorrect NPIs increased (4%, 13%, 17.39%) as seen in example (5), and interrogatives were not affected (45%, 60% and 52.17%).

(5) *Le gusta ningún pastel (He likes no cake).

We found that only Caribbean students produced subjects in pre-verbal position in Spanish. Our findings indicate that in these bilingual children, gradual L2 acquisition of negation, NPIs and interrogation in English co-occurs with L1 attrition of NPIs but not of negation or interrogation, suggesting that some functional features are more vulnerable to attrition than others in sequential L2 development in children.

On the direction of cross-linguistic influence: Plural morphology in unbalanced bilinguals acquiring German and English

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Research on bilingual first language acquisition has established that crosslinguistic influence in bilingual first language acquisition is likely to occur with phenomena instantiating some overlap of the two languages at surface level (see Meisel 2007 for discussion). Müller & Hulk (2001) further predicted that language influence is unidirectional depending on the complexity of a syntactic phenomenon in each language: If there are two languages, A and B, and language A provides only one possible analysis, X, for a syntactic construction 1, while language B provides two possible analyses, X and Y, then analysis X is reinforced, whence language influence from language A to language B is expected. This mechanism is claimed to be independent of language dominance (Müller & Hulk 2001: 19).

The present study applies this proposal to the acquisition of morphology. I examine longitudinal and cross-sectional data from children acquiring German and English simultaneously in early childhood, focusing on the plural marking of nouns.

Müller & Hulk's condition is met in the following way: The great majority of English nouns form the plural by adding an *-s* to the singular form. Hence, English predominantly provides only one morpheme for nominal plural marking. German, by contrast, exhibits several morphemes. While some German nouns select the morpheme *–s* (e.g. *Auto/s* 'car/s') just as English does, German also exhibits the plural morphemes *-e* (*Hund/e* 'cat/s'), *–(e)n* (*Katze/n* 'cat/s'), *-(e)r* (*Lied/er* 'song/s'), and *Ø* (*Käfer/Käfer* 'bug/s'). Hence, there is partial overlap with German plural marking being more complex than English plural marking. Accordingly, influence from English to German is the expected case. I refer to this as Complexity Hypothesis.

This study further controls for the factor of language dominance by examining German-dominant children as well as English-dominant children. If language dominance were crucial in determining the direction of influence, children with English as their strong language should overgeneralize *–s* with German nouns (e.g. **Murmels* (Murmeln) 'marbles'). Since *–en* is the suffix most often overgeneralized by monolingual German children, German-dominant children might be expected to overgeneralize *–en* (e.g. **Käfern*), or even use it with English nouns (e.g. **forken* instead of *forks*), while overgeneralization of *–s* should not occur (at least not to a higher extent than in monolinguals). I refer to this as Dominance Hypothesis.

A preliminary analysis yields the following results: Regardless of their dominance, children never attach *–e*, *–en* or *–er* suffixes to English nouns, while *–s* is sometimes overgeneralized with German nouns, e.g. **Blumes* (Blumen) 'flowers', **Brückes* (Brücken) 'bridges'. At first sight, this appears to support the Complexity Hypothesis. However, contrary to what is predicted by the Complexity Hypothesis, only English-dominant children but not German-dominant children overuse *–s*. German-dominant children overuse *–(e)n*, akin to monolingual children. In other words, influence is absent when German is the dominant language. The study implies that both complexity and dominance must be taken into account when predicting crosslinguistic influence.

Thinking for speaking in two languages: Does language-specific conceptualization affect bilingual children's productions?

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A strong explanation for cross-linguistic transfer in bilingual children involves features of the morphosyntax that exhibit structural overlap and ambiguity (Döpke, 1998; Müller & Hulk, 2001). These variables continue to be identified even when approached from different theories of grammar, i.e., Universal Grammar (Müller & Hulk, 2001) and Bates and MacWhinney's (1989) Competition Model (Döpke, 1998). Structural overlap is identified when a particular construction is part of the grammar for two languages (e.g., prenominal adjectives). Ambiguity refers to the existence of more than one possible structure within a language (e.g., prenominal and postnominal adjectives in Romance languages). In this study, we are working within the framework of the Competition Model (as in Döpke, 1998).

Overlap and ambiguity can explain much but not all of the existing data on bilingual children's transfer. One exception is found in French-English bilingual children's adjective-noun ordering (Nicoladis, 2006). These children occasionally mis-ordered English adjectives (e.g., "a monkey purple"), even though there is no ambiguity in English. To explain these results, Nicoladis (2006) proposed a speech production model, assuming a roughly serial order of processing (a conceptualization phase, a lemma phase and finally a phonological phase). According to such a model, transfer would be demonstrated by speech production errors resulting from competition between the two languages.

One prediction from this model is: if a bilingual's two languages are associated with different conceptualizations, there should be no transfer, even when there are overlapping and ambiguous structures. In the present study, we tested this prediction by asking French-English bilingual children to name moving figures (e.g., a walking girl). There are overlapping and ambiguous constructions to describe moving figures in English and French. However, the languages are conceptually different because the English constructions highlight the ongoing action while the French constructions do not.

In study 1, French and English monolingual and bilingual children labeled moving figures. Although the bilingual children were slightly behind the English monolinguals in their production of two-word labels, they showed no influence from French. The French constructions were like those of the monolinguals and showed no influence of English.

If the children's conceptualization was language-specific, we should detect this effect in a task that requires children to remember what they saw.

Study 2 tested children's memory for the same sets of moving objects. We asked French-English bilingual children and English monolinguals to watch the objects and then remember what they saw to tell us later. After a short distractor test, the children were probed to determine if they remembered the action that the objects were performing. We expect the bilingual children to recall more actions in English than in French but no differently from monolinguals.

These results would support the idea that bilinguals conceptualize their message for the target language. If the conceptualizations differ between their two languages, no cross-linguistic transfer will occur, even if overlapping and ambiguous constructions exist. Thus, these results are consistent with a speech production model framework.

A multi-factorial account of cross-linguistic influence: The role of typological distance, language of the community and age in the acceptability of subject pronouns in Italian

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This study investigates the comprehension of Italian null and overt subject pronouns in Italian-English and Italian-Spanish bilingual children aged 6-7 and 8-10, monolingual age-matched children, and monolingual adults. The main aim of the study was to establish the role played by the two different language combinations (Italian-English vs. Italian-Spanish), by the language of the community (Italian vs. English), and by the children's age (6-7-year-olds vs. 8-10-year-olds) in the acceptance of subject pronominal forms in two different discourse contexts.

All the participants took part in two acceptability judgement tasks where they were required to watch a series of short cartoons while they listened to two sentences containing the target pronouns. Their task was to choose the sentence that best fit the scene they had just watched. The study included two conditions: a 'no-topic shift' condition where the target null pronoun referred to a topic antecedent (*Minnie$_i$ ha detto che ø$_i$ è caduta, 'Minnie has said that (she) fell'*), and a 'topic shift' condition in which the target overt pronoun referred to a non-topic antecedent (*Minnie$_i$ ha detto che lei$_k$ è caduta, 'Minnie has said that she fell'*). In each condition the participants had to choose between a sentence with a null subject pronoun and one with an overt subject pronoun (*lei, 'she', lui, 'he'*). In the 'no-topic shift' condition the results showed a significant effect for age, with older children choosing significantly fewer inappropriate overt subject pronouns than younger children, and a significant interaction between language of the community and age with the younger bilingual children in the UK choosing significantly more inappropriate overt pronouns than their bilingual and monolingual counterparts in Italy. No significant differences were observed between bilingual children learning Spanish or English together with Italian. Significant differences were also found in the 'topic shift' condition with monolingual children and adults selecting significantly fewer inappropriate null pronouns than bilingual children, regardless of age and language of the community.

These findings suggest that being bilingual leads to greater difficulty in the acquisition of the discourse conditions governing the distribution of subject pronouns. Moreover, it suggests that that the problem experienced by bilingual children is not restricted to the distribution of the overt pronoun in 'no-topic shift' contexts, as the previous literature claims on the basis of production data, it also involves some confusion related to the acceptance of null pronouns in 'topic shift' contexts.

The bilingual children in these studies showed significantly different patterns of behaviour from monolinguals as a function of the number of languages spoken (two vs. one), age (young vs. old), and of language of the community (English vs. Italian). Typological relatedness between the two languages played a less clear role in this metalinguistic task, suggesting that the interaction between a bilingual's two languages is complex and that a range of factors beside cross-linguistic structural overlap must be considered to account for cross-linguistic influence.

Cross-linguistic transfer in young bilingual children's judgments

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Investigation into the nature of bilingual language development has focused on how the languages influence each other. Evidence has indicated that cross-linguistic influence is likely to occur when a particular construction exists in both languages and if that construction takes more than one form in one of the languages (Müller & Hulk, 2001; Sánchez, 2004). Recent research has also provided evidence for cross-linguistic influence or transfer in areas in which the grammar is affected by the pragmatic context (Müller & Hulk, 2001; Sorace, 2000). However, influences can occur in areas outside of the syntax-pragmatics interface (Nicoladis, 2006).

Most research investigating cross-linguistic influence early in development has focused on children's productions. The current study moves beyond children's productions and examines how clearly delineated the two languages are during development. To address this question, cross-linguistic influence is investigated in the grammaticality judgments of bilingual children. Children between 3 and 6 years-of-age were presented with a video of a puppet learning French and English. The children were asked to judge the acceptability of individual sentences (e.g. "does this sound silly") (McDaniel, McKee, & Smith Cairns, 1996). French-English bilingual children judged a set of English sentences and a different set of French sentences on a different day while monolingual English children were only presented with English sentences. Half of the sentences exhibited properties that are acceptable in only one of the languages (conflicting) and half of the sentences exhibited properties that are acceptable or unacceptable in both languages (converging). Noun-adjective (e.g. car black), determiner-noun (e.g. the nurse), and verb-object (e.g. kisses them) ordering was manipulated to create the sentences. In English, only one ordering is acceptable and in French multiple orderings are acceptable depending on the vocabulary used.

If cross-linguistic influence in children is a phenomenon of production, then no cross-linguistic influence will be found and the bilingual children's judgments will be similar to that of the monolingual children and be accurate for each language (Nicoladis, 2006). However, many studies have provided evidence for cross-linguistic influence (e.g. Müller & Hulk, 2001; Sánchez, 2004; Sorace, 2000). In addition, evidence for cross-linguistic influence has been observed in the grammaticality judgments of adult bilinguals (e.g. Chan, 2004; Johnson & Newport, 1989). Therefore, it is predicted that cross-linguistic influence will be found in this study as demonstrated by bilingual children judging conflicting sentences according to the sentence's acceptability in the other language in comparison to converging sentences, which will be judged accurately. Although, the results of Müller and Hulk (2001) would predict that greater cross-linguistic influence should occur in French over English because only one alternative is found in English and multiple alternatives are found in French, creating ambiguity, Nicoladis (2006) did not find this asymmetry with French and English constructions outside of the syntax-pragmatics interface. Therefore, it is predicted that cross-linguistic influence will occur in both French and English in accordance with the production results of Nicoladis (2006). It is also predicted that cross-linguistic influence will only be observed as grammatical judgments on ungrammatical sentences since the grammatical sentences should be instances of constructions that the children have been exposed to in the past. This result would indicate that while children are still acquiring two languages, the grammars of French and English do influence one another during language processing beyond that of production.

Evidence from this study will provide information about how one-language influences the other during development and if this influence is affected by the particular constructions being processed or if it is a result of the type of processing that is occurring.

Symposium Session 7 - Thursday 31 July 11.00 - 13.00
Symposium Number – S7-4

Chair: Erika Hoff, *Florida Atlantic University*
Discussant: Erika Hoff, *Florida Atlantic University*

How phonological development supports lexical development

Description:
This symposium presents the argument that prior to the expression of their first words, children are developing an understanding of the sound system of their language and that this gradual process of phonological development provides the underpinnings of subsequent lexical development. Together, five papers build the empirical case that phonological development and lexical development are related and provide a theoretical account of the processes underlying these relations.

The first paper presents a theory of how infants build the phonological categories of their languages through interactions with their caregivers and how these categories are then brought to bear in the task of word learning. The second paper looks at infants' speech perception skills and at older children's phoneme production and finds evidence that both are related to children's the rates of lexical development. That is, speech perception skills in infancy predict later lexical development, and older children with small expressive vocabularies for their age (late talkers) use a more restricted phonological inventory than children with larger vocabularies for their age.

The third paper takes the theoretical position that the developing phonological system shapes early lexicons, in contrast to the position that lexical development pushes phonological development. The evidence marshalled in support of this argument consists of findings that children's prelinguistic syllable production is linked to later vocabulary size and that the words in children's vocabularies in their second year, across languages, conform to children's phonetic abilities.

The fourth paper presents findings which locate the effect of phonological development on lexical development in the part of the word learning process that involves the creation of new lexical entries. In experimental test, preschool children with delayed phonological development performed less well than children with age-typical phonological development in a short-term word learning task, but not in immediate repetition of phoneme sequences and not in long-term word learning.

The fifth paper argues that the reason delayed phonological development interferes with the creation of lexical entries is that fragile phonological representations give rise to fragile phonological memory, which in turn affects learning new word forms. In partial contradiction to the findings in the fourth paper, this paper presents evidence that immediate repetition of phoneme sequences is sensitive to differences in phonological knowledge—in both monolingual and bilingual children under the age of two years. Consistent with the larger argument, however, the paper also reports findings that fragile phonological memory is related to smaller expressive vocabularies.

This symposium brings together theory and data spanning the age range from early infancy to the preschool period and spanning domains from infant speech perception to toddler vocabulary production. The papers in this symposium together outline an account of early phonological development and a role for early phonological development in lexical development.

The creation of phonological categories and the negotiation of word meanings in early lexical development

D. Kimbrough Oller, Heather Ramsdell
University of Memphis

In a traditional view, infants are assumed to possess an extensive repertoire of phonological categories form which to draw at the beginning of lexical development. Often it is thought that all sounds of the world's languages are pre-wired and are only tuned and reduced dramatically in number in the course of auditory experience. Vocal activity on the part of the infant is generally not assigned much importance in this traditional view.

Our working assumption is fundamentally different: We presume the infant begins life with no speech categories. Longitudinal research indicates that the first voluntary vocal categories to emerge (in the first few months of life) are quite distant from speech – squeals, growls, quasivowels, etc. (Stark, 1980; Oller, 1980, 2000; Koopmans-van Beinum, 1986). These precanonical sounds appear to be toys in a vocal playground where infants gain control of phonation. The sounds tend to show considerable within-category variability ("raw infraphonological material"), a manifestation of the exploratory and creative nature of vocal development. By the middle of the first year, infants typically combine supraglottal articulation systematically with phonation to produce canonical syllables repetitively. These syllables constitute the next level vocal category created by infants, and at both the precanonical and canonical levels, each vocal category can be used in flexible ways to express various emotional states, to attract attention, or just to explore sounds. No non-human primate produces sounds with such flexibility, nor do they create sound categories that are not a part of a relatively fixed species repertoire. In these ways human infants show special foundations for speech.

Another way humanity is special is that with the start of the canonical stage, caregivers intuitively begin interacting and implicitly negotiating with infants about possible referential meanings for canonical syllables, a process initiated as soon as parents recognize any canonical syllables as repeatable (Papousek, 1994). Either the infant or the caregiver can propose a meaning (by pointing or another systematic usage of the syllable or syllable sequence). The caregiver tends to negotiate only over those syllables that are recognized as repeatable (hence the importance of reduplicated canonical babbling) – syllables do not have to be adult-like to be negotiable, and thus intra-category variability is acceptable as long as contrastivity can be maintained.

Our approach emphasizes a distinction between raw material and negotiable phonological product, and this distinction helps bring the infant's functional repertoire into focus. On the other hand the traditional use of phonetic transcription to determine the content of repertoires can over-represent the infant repertoire, suggesting it to consist of hundreds of categories. Such transcription may reflect raw material but does not specify the infant's functional repertoire of negotiable elements. Research suggests the negotiable syllable types of the second half of the first year are typically only a handful (Oller & Ramsdell, 2005; Alford, 2006; Ramsdell, Oller, & Buder, 2007), often from one to six negotiable syllables. The paper will outline procedures by which we are pursuing the delineation of early lexical development and its relation with the creation of phonological categories by infants.

Perceptual and productive sensitivities to native phonology that facilitate language acquisition

Nan Ratner
University of Maryland

This presentation will use data from two independent sets of investigations to show the continuity of perceptual and productive phonological factors in infant language development. The first investigation (Newman, Ratner, Jusczyk, Jusczyk & Dow, 2006) retrospectively analyzed perceptual processing of a cohort of infants to show the predictive value of conversational speech segmentation in facilitating language outcomes. Ability to segment individual words from the fluent speech stream predicted expressive vocabulary accumulation at 24 months. Additionally, infants who were proficient at speech segmentation outperformed infants who had

not evidenced this ability on both expressive and receptive language measures at 36-48 months, although groups did not differ in non-verbal intelligence.

Additional data from this cohort obtained through MacArthur-Bates CDI parental report also showed a strong tendency for later-talking 24 month olds to "pick and choose" initial expressive vocabulary on the basis of phonological simplicity (as measured by typical age-of-acquisition of consonantal targets and syllabic complexity; Irgens, Ratner & Jusczyk & Nuckel, 2001). Conversely, more advanced language users attempted all MCDI targets, regardless of phonological attributes. Such data are consistent with those from a second program of investigation (Rescorla & Ratner, 1996; Pharr, Ratner & Rescorla, 2000) that showed limited phonetic inventories in late talking toddlers. Late talkers don't just accumulate an initial lexicon more slowly; they appear to be significantly limited in their phonological inventories (as shown by babble as well as attempted words). Taken together, these investigations suggest that sensitivity to phonology and phonological regularities in the input combine to enable representations for the initial lexicon. Those children who show limitations in segmenting speech input show corresponding problems in mapping the phonology of early words; additionally, for some toddlers, failure to accumulate expressive vocabulary appears directly attributable to inability to extract a core phonology.

Lexical acquisition: Effects of phonology

Carol Stoel-Gammon, Anna Vogel Sosa
University of Washington

This talk will explore interactions between lexical acquisition and phonetic-phonological development in children with typical speech-language acquisition. It will be argued that a child's productive phonological system, including the sounds produced in babble, influences the lexicon rather than the lexicon influencing phonology. The presentation will focus on two aspects of lexical acquisition: (1) the onset and growth of productive vocabulary and (2) the form/nature of early words. Most of the data will come from studies of children acquiring English although data from other languages will be introduced when appropriate.

In spoken language, the onset of words requires the merging of two linguistic "strands": the ability to produce a sequence of sounds and syllables that resemble the ambient language and the knowledge that sounds can represent meaning. Studies of word recognition have shown that infants can recognize individual words well before they can produce them. Thus, it appears that awareness of a sound-meaning link is in place prior to the production of first words. Longitudinal studies of the emergence of words have shown that infants who produce more adult-like utterances in babble (specifically more consonant-vowel (CV) syllables like [ma] or [ba]) produce "real" words at a younger age than infants who produce few CV syllables. Moreover, production of CV syllables in the prelinguistic period has been linked to vocabulary size of children 18-30 months.

Once a child begins to acquire words, vocabulary expands rapidly and communication is enhanced. Initially, researchers assumed that the early lexicon was composed of words that filled certain semantic and or pragmatic functions. However, it has been well documented (Stoel-Gammon, 1998) that phonological factors play a significant role in the composition of a child's vocabulary. During the second year of life, children tend to select words that conform to their phonetic abilities and avoid words that they are unable to produce. Data from the Communicative Developmental Inventories (CDI) reveal that American children produce a high proportion of monosyllabic words and words that begin with stops, especially /b/. The proportions in child speech are much higher than they are in the adult language or in adult speech to children. Data from the Cantonese CDI revealed similar tendencies in children from Hong Kong (Fletcher et al., 2004).

The effect of delayed phonological development on sub-lexical and lexical processing in preschool children

Holly Storkel, Jill Hoover, Junko Maikawa
University of Kansas

This talk will explore the type of processing (and representations) affected by delayed phonological development in preschool children. Thirty-four preschool children, 17 with normal phonological development and 17 with delayed phonological development, participated in three tasks that varied in the type of processing required. The first task was a nonword repetition task that was thought to tap sublexical (i.e., individual sound) processing. The second task was a short-term word learning task that tapped both sublexical and lexical (i.e., whole word) processing. The third task examined long-term word learning, a measure of lexical processing. This task classification was further verified by examining the effects of phonotactic probability and neighborhood density in each task. Phonotactic probability is the likelihood of occurrence of a sound sequence and typically is associated with sublexical processing. On the other hand, neighborhood density refers to the number of words that sound similar to a given word and is associated with lexical processing.

Results confirmed the classification of each task. Specifically, phonotactic probability affected performance in the nonword repetition task and the immediate word learning task, confirming that these two tasks entail sublexical processing. In addition, neighborhood density affected performance in the immediate and long-term word learning tasks, suggesting that these two tasks tap lexical processing. Moreover, results showed similar performance across children with normal phonological development and children with delayed phonological development in the nonword repetition task, suggesting intact sublexical processing in children with phonological delays. Likewise, the two groups performed similarly in the long-term word learning task, suggesting intact lexical processing. In contrast, group differences were observed in the short-term word learning task, and these differences were specific to the effect of neighborhood density on word learning. This finding indicates that delayed phonological development affects the ability to create new lexical representations and integrate these new representations with existing lexical representations during short-term learning. This further suggests the possibility that the quality of lexical representations may differ between children with phonological delays as compared to children without phonological delays.

Taken together, early delays in phonological development appear to have consequences for lexical processing and representations. Future research should examine whether these lexical differences continue after the original phonological delay resolves.

Relations between phonological memory and expressive vocabulary in the second year

Erika Hoff, Cynthia Core, Kelly Bridges
Florida Atlantic University

This paper makes the argument that phonological memory is one mechanism by which phonological development shapes lexical development. It is well established that phonological memory is related to vocabulary size and to further vocabulary development in children aged 3 and over. This work pursues the hypotheses that the differences in phonological memory skill that predict vocabulary development are in part a reflection of differences in phonological knowledge. That is, phonological development consists of developing the representations of phonemic categories that support accurate phonological memory.

Two studies of 20- to 24-month-old monolingual, English-learning children measured the children's accuracy at nonword repetition (NWR), as a measure of phonological memory, and measured the children's productive vocabulary size using the MacArthur-Bates Communicative Development Inventory. In both studies, these measures were significantly correlated, with NWR accounting for between 25 and 50 percent of the variance in CDI percentile scores.

To eliminate the possibility that NWR accuracy reflected peripheral articulation difficulty rather than a central memory process, children were also given a real-word repetition test in both studies, where the real words were matched to the nonwords in phonological characteristics. In both studies, real word repetition accuracy was significant greater that nonword repetition accuracy, indicating that nonword repetition has a source of difficulty that real word repetition does not. We argue that this is the creation and storage of sublexical units.

To test the hypothesis that it is the memory component of the NWR task that is related to lexical development, partial correlations were calculated between NWR accuracy and vocabulary percentile, removing the variance shared with real word repetition accuracy. That partial correlation was also significant.

In current work we are testing the longitudinal relations between NWR accuracy and vocabulary growth during the second year and we are testing the language specificity of the relations between NWR and vocabulary in Spanish-English bilingual children. The bilingual children who are more advanced in one of their languages than the other provide the opportunity to test the hypothesis that language knowledge, not only maturational status or fixed capacity differences, that causes individual differences in phonological memory.

The larger theoretical argument of this paper is that children's language learning abilities change as their language knowledge changes. The influence of phonological knowledge on the capacity to learn new word forms is one example of such a change.

Symposium Session 7 - Thursday 31 July 11.00 - 13.00
Symposium Number – S7-5

Chair: Caroline Rowland, *University of Liverpool*
Discussant: Brian MacWhinney, *Carnegie Mellon University*

Solving the no-negative evidence problem using positive evidence: Data from mathematical, computational, elicited-production and grammaticality-judgement studies

Description:
The defining characteristic of human language is that it allows speakers to produce completely novel utterances as opposed to simply reproducing previously-heard sentences. The challenge for language-acquisition theorists is to explain how children learn to produce only grammatical novel utterances and not utterances that are regarded as ungrammatical by adult speakers. For example, native English-speakers are able to produce utterances with novel verbs such as "The man pilked the ball" on the basis of hearing utterances such as "The ball pilked" [novel manner-of-motion verb], yet, at the same time, are able to avoid producing "*The clown giggled Lisa" despite hearing "Lisa giggled". This apparent learnability paradox, which constitutes "one of the most intriguing and difficult challenges" facing the field (Bowerman, 1988: 73) is known as the "no-negative-evidence" problem: Whilst parents provide some feedback on the ungrammaticality of utterances (e.g., requests for clarification) this is unlikely to be either necessary or sufficient (Marcus, 1993): Adult speakers can recognize a generalization as ungrammatical without having produced it - with a subsequent parental correction - during childhood.

The papers in this symposium investigate mechanisms by which children could cut back from overgeneralization errors on the basis of positive evidence (i.e., the sentences they hear) alone. Converging evidence is provided from four different research paradigms: Formal mathematical analysis (Bayesian logic), computer-simulation studies and elicited-production and grammaticality-judgement studies with children.

Paper 1 introduces the no-negative evidence problem and evaluates its central claim – that the ungrammaticality of an utterance cannot be inferred from its absence – from a Bayesian-probability perspective. It is shown that if the prior probability of an utterance (e.g., "*The clown giggled me") occurring in the input is high (e.g., because many contexts have arisen in which "giggle" could have been used in this way) but it has not yet occurred, then the inference of ungrammaticality is rational.

Paper 2 complements this approach by investigating precisely how a rational learner could avoid overgeneralization errors on the basis of positive evidence alone. This is accomplished using an exemplar-based computational model in which errors are seen as on-line generalizations based on local information. This allows the model to "retreat" from such errors without ever having to retract any information.

The remaining studies investigate whether actual learners show evidence of restricting their generalizations solely on the basis of positive evidence. Focussing on morphology, Paper 3 provides evidence from an elicited-production study that children can retreat from plural overgeneralization errors (e.g., "mouses") without negative evidence. In fact, counter-intuitively, production of the overgeneralized form facilitates its replacement by the correct form (e.g., "mice"), presumably by increasing the activation of this latter form in memory. Paper 4 provides evidence that argument-structure overgeneralization errors (e.g., "*The clown giggled/laughed me") are rated as more acceptable for lower than higher frequency verbs, presumably because the inference-from-absence is stronger for the latter. A new account is proposed which integrates these findings with semantic effects observed in the experimental data.

The no-negative-evidence problem and the inference from absence: A Bayesian approach

Ulrike Hahn
University of Wales

Given that direct evidence of the ungrammaticality of such forms as **mouses* or **The clown giggled Lisa* (i.e., negative evidence) is largely unavailable or ignored (Marcus, 1993), it follows that learners must make such inferences of ungrammaticality solely on the basis of positive evidence (i.e., the sentences that they hear). This raises the puzzle of how learners could come to appreciate that certain constructions are not allowed, given that the mere fact that something has not occurred in the input so far does not mean that it can not and will not occur eventually. Considered probabilistically, however, the absence of a particular construction can be more or less informative, depending on context. The talk outlines a Bayesian framework in which this kind of 'inference from absence' can be captured, and indicates the conditions under which such inferences from non-occurrence to non-existence are reasonable. This analysis is then also used to clarify the role of two widely cited mechanisms, pre-emption and entrenchment, in this context.

The gist of this analysis can be illustrated with a simple intuitive argument. Inference from absence becomes more informative the greater the expectation of a (positive) observation: If I am considering whether I have lost a sock, failing to find it in the sock drawer, the laundry basket, and the washing machine will make me reasonably convinced that I no longer have it. By contrast, failing to find it in the refrigerator, on the roof, and the spice rack, will have little impact on my beliefs about this sock.

Traditionally, sceptics considering the strength of potential inferences-from-absence in the context of language acquisition have focused on the fact that many constructions have a very low frequency - and hence, probability of occurrence - so that mere non-occurrence is not informative. However, the overall frequency of a construction in the language is misrepresentative of its probability in a particular linguistic context. This is because probability-of-occurrence is not flat across possible utterances, in exactly the same way that the overall frequency of a word in the language is not a good stand-in for its probability-of-occurrence in a particular linguistic context. For example, the past tense form *shone* might be fairly infrequent in the language, but it is considerably more likely in

discourse about the sun than it is in discourse about banking. Moreover, the strength of an inference-from-absence is determined not simply by the probability with which an item was expected, but rather it depends on ratios of expectations.

The paper shows how, given reasonable assumptions about the relevant probabilistic quantities in the natural language input, inference-from-absence can be a justified and useful probabilistic inference. Pre-emption (whereby - for example - *The clown made Lisa giggle* blocks **The clown giggled Lisa*) and entrenchment (where all correct uses of *giggle* constitute evidence that the non-attested form is ungrammatical) constitute contexts where the erroneous form has a high probability-of-occurrence (were it, in fact, allowed), making these contexts particularly informative.

Using on-line local generalizations to recover from overgeneralization

Morten Christiansen[1], Nick Chater[2]
[1]*Cornell University,* [2]*University College London*

The no-negative-evidence problem is typically construed as the problem of how children cut-back from over-general "rules" that perform operations such as adding *–s* to form a noun plural (e.g., mouse →**mouses*) or transforming an intransitive sentence into a transitive-causative (e.g., *Lisa giggled* → **The clown giggled Lisa*). Under this traditional "rule-based" view (e.g., Pinker, 1984), linguistic generalizations are considered to be explicitly-represented and global in nature (i.e., they apply across all relevant instances of a particular linguistic phenomenon). This gives rise to overgeneralizations of the type discussed above, and to the question of how children could learn that the generalization does *not* apply to some items, in the absence of evidence that this is the case (i.e., negative evidence).

In this talk, we argue that an approach to language acquisition based on on-line local generalization can resolve this apparent learnability paradox, and recover from overgeneralization using only positive evidence.

Complementary to the Bayesian approach in Paper 1, we first highlight recent mathematical results establishing that an 'ideal learner', which finds the simplest representation of the linguistic input encountered so far, can solve the problem of overgeneralization, in a probabilistic sense. Specifically, even over an infinite corpus, the ideal learner makes only a *finite* expected number of overgeneralization errors; and hence the rate of such errors collapses arbitrarily close to zero as the corpus is encountered. Moreover, the rate of convergence is proportional to the complexity of the language (measured in "bits" of information). But these results leave open whether a computational model of selective generalization, and recovery from overgeneralization, is practically feasible; and whether it can capture the broad patterns observed in child language acquisition.

The second part of the talk presents an exemplar-based computational model of linguistic generalization. The basic premise for the model is that generalizations are inherently local and generated on-line—no global generalizations are represented explicitly. As an intuitive metaphor for how the model works, consider a situation in which a learner has to learn two categories from a set of data points represented in a two-dimensional space. Generalization is controlled by the average nearest neighbour distance in the data (essentially an index of the density of data points). Initially, when the data points are sparsely distributed they blend into a single category, stretching across much of the space, and resulting in overgeneralization. But as more data accumulates, generalization becomes tighter, leading the intervening space between the two categories to "open up", and the learner correctly categorizes new input into the appropriate category. Because generalizations are made on-line, based on local information, the learner "recovers" from the initial overgeneralization without ever having to retract any information.

Whereas the mathematical results indicate that recovery from overgeneralization is possible using only positive evidence, the computational model aims to demonstrate how on-line local generalization allows a learner to solve the no-negative-evidence problem without needing negative evidence, domain-specific constraints or explicit rules (as real learners are argued to do for noun-plural and argument-structure overgeneralizations; Papers 3 & 4).

Linguistic self-correction in the absence of feedback: A new approach to the no-negative evidence problem

Michael Ramscar, Daniel Yarlett
Stanford University

One area in which the no-negative evidence problem has been argued to be particularly serious is that of overgeneralization errors in inflectional morphology (e.g., **mouses, *sitted*). Once a child has (apparently) formed a regular "rule" (e.g., "add *–s* to form a noun plural") it is not easy to see how – given the lack of negative evidence – the child could learn to produce only grammatical (e.g., *mice*) and not over-regularized (e.g., **mouses*) forms. Indeed, it has been claimed that such learning is not possible without some innate mechanism that is specific to language. For example, Marcus et al (1992) propose an innate "blocking" mechanism that suppresses the "*add –s*" noun pluralisation rule and reduces the likelihood of erroneous forms being produced as memory for correct irregular forms strengthens by repeated exposure.

We will describe a series of studies in which children show increasing mastery of irregular plural forms (e.g., *mice*) simply by producing erroneous over-regularized versions of them (e.g., **mouses*). We shall show how this behaviour makes perfect sense in terms of a model of successive approximation in imitation. The model predicts that children will over-regularize early in acquisition because the representations of frequent, regular plural forms develop more quickly, such that at the earliest stages of production they interfere with children's attempts to imitatively reproduce irregular forms they have heard in the input. As the strength of the representations that determine children's productions settle asymptotically, the early advantage for the frequent regular forms is negated in the model, and hence children's attempts to imitate the irregular forms they have observed become more likely to succeed (a process that produces the classic U-shape in children's acquisition of plural inflection). The model adheres to basic principles of learning theory.

These data show that children can acquire correct linguistic behaviour without feedback in a situation where, as a result of philosophical and linguistic analyses, it has often been argued that it is logically impossible for them to do so. In fact, children can successfully resolve this apparent learnability paradox simply through repeatedly rehearsing the production of the knowledge they have extracted from the environment. They do not appear to need feedback, explicit or otherwise, to do this.

In demonstrating how the internal dynamics of children's developing representational systems create and resolve erroneous over-regularization behaviours, these studies expose the limited relevance of logical arguments about behaviour to problems such as the acquisition of language (though – as argued in Paper 1 – such arguments do not lead inevitably to the conclusion of a learnability paradox in any case). Predictions about the way a child's language will develop can only be made if the various representations it comprises *and the ways in which they interact* are considered. One simply cannot make predictions about how a given representation will develop over time without considering the other representations in the system, and their development over the same period.

The no-negative evidence problem for argument-structure overgeneralization errors: Why statistical entrenchment is not sufficient

Ben Ambridge, Julian Pine, Caroline Rowland
University of Liverpool

Many overgeneralization errors have a directly-competing correct form which will eventually win out over the incorrect form (e.g., **mouses* vs *mice*; Paper 3). Potentially more challenging are argument-structure overgeneralization errors (e.g., **The clown giggled Lisa*) which have only indirect "pre-empting" competitors (e.g., the periphrastic causative *The clown made Lisa giggle*). In this talk, we will present evidence from three grammaticality-judgement studies that children can use positive evidence alone (e.g., grammatical sentences such as *Lisa giggled*) to overcome this learnability problem, even in the absence of "pre-empting" sentences. Our central theme will be that simple tallying of the constructions in which a verb has occurred (e.g., *giggle* in the intransitive) in is not sufficient to explain the pattern of experimental data observed: Learners must also acquire the semantics of particular argument-structure constructions (e.g., transitive causative = direct unmediated external causation) and of particular verbs (e.g., *giggle* = internally caused semi-voluntary action), rejecting novel utterances (e.g., **The clown giggled Lisa*) when the semantic mismatch between the two is too great for the "coercion" to occur.

Study 1 investigated the causative alternation. Participants (aged 6-7, 9-10 and adults) rated overgeneralizations as least acceptable with high frequency verbs (e.g., *laugh*), most acceptable with novel verbs (e.g., novel laughing verb) and intermediate with low frequency verbs (e.g., *giggle*), supporting a statistical "entrenchment" account, where repeated presentation of a verb in one construction renders non-attested uses increasingly ungrammatical. Semantic effects were also found. For example, participants rated transitive uses of the novel laughing verb as less acceptable than transitive uses of a novel falling verb, presumably because falling, but not laughing, events can be directly physically caused by an external "causer". Importantly, participants did not need to hear novel verbs used in a "pre-empting" periphrastic-causative construction to infer their ungrammaticality in the transitive causative.

Study 2 replicated these findings for the dative alternation. Participants rated double-object-dative uses of a novel verb (e.g., **Marge meeked her friend the box*) as significantly less acceptable than prepositional-object datives (*Marge meeked the box to her friend*), based on the experimentally-assigned semantics of *meek* (manner of pulling), again without hearing a "pre-empting" construction. Again, this effect was larger for low frequency verbs, and larger again for high frequency verbs (e.g., **Marge dragged/pulled her friend the box*). A morphophonological effect was also observed with participants rejecting semantically-appropriate uses of novel Latinate-sounding verbs in the Germanic double-object construction (e.g., **Marge donated/orgulated the library the book*).

Study 3 showed that the acceptability of transitive-causative overgeneralizations increased when the causality was made more direct by the addition of an "agent-like" instrument (e.g., **The clown's joke giggled Lisa* was rated as more acceptable than **The clown giggled Lisa*). If learners infer that *giggle* cannot be used transitively simply by tallying the number of uses in the intransitive, both sentences would presumably have been rated as equally unacceptable. Thus it seems that learners additionally acquire the semantics of particular constructions, and reject sentences in which the semantics of the verb are inconsistent with this meaning.

Symposium Session 8 - Thursday 31 July 16.30 - 18.30
Symposium Number – S8-1

Chair: Gary Morgan, *City University*
Discussant: Virginia Volterra, *Institute of Cognitive Sciences and Technologies*

Gesture and language development in children with language impairments

Description:
The papers collected together for this symposium represent the cutting edge of research in gesture, language development and language impairment.

In typical language development much research highlights the importance of gesture in linguistic and cognitive progression. For example children often produce their first gestures several weeks before they say their first words. Gestures outnumber words in one year olds and children show a preference for gestural over verbal communication in their spontaneous interactions at this age. Gesture is also correlated with production and even more with comprehension of words (Wagner & Goldin-Meadow, 2006). Additionally some research suggests that teaching typically-developing hearing children to gesture has positive effects on language development (Goodwyn, Acredolo & Brown, 2000).

The previous research on how language impaired children use gesture paints a mixed picture. Reports of gesture use in children with language impairment is somewhat contradictory. Hill (1998) tested 20 children using copying of both non-symbolic hand gestures (pat the table then twist at the elbow), as well as symbolic gestures (hand and arm movements to indicate an action e.g. riding a bike). Despite the children having no reported motor problems prior to this study over half the children (11) had a lower than normal performance on this task. Therefore gesture production in this group was impaired along with spoken language. This is consistent with the notion that speech and gesture is controlled by a single cognitive system (McNeil, 2000).

In contrast, other research finds that gesture and linguistic abilities are relatively separate in children with LI. For example, Thal et al (1991) measured use of communicative gestures in a group of children with delayed onset of expressive oral vocabulary (late talkers) compared with such use among normal-language-matched controls and age-matched controls. Analyses revealed that late talkers used significantly more communicative gestures and for a greater variety of communicative functions than did language-matched controls. However, a follow-up revealed that 4 of the late talkers remained delayed (truly delayed late talkers) and 6 caught up (late bloomers). Only late bloomers used more communicative gestures than did language-matched controls. However it was still the case that the truly delayed talkers used gesture as much as the language-matched controls either for number of gestures, type of gestures (symbolic vs. non-symbolic), or number of different functions for which gestures were used. More recent studies have concluded that children with SLI often expressed more sophisticated knowledge about events in gesture (and in some cases, distributed across speech and gesture) than in speech (Evans, et al, 2001).

These different findings suggest this topic requires more empirical investigation. One motivation for this research would be to contribute to our understanding of what complimentary symbolic systems interact with verbal language development and why this does or does not work in children with language impairments. In addition a greater understanding of this topic would be valuable for stimulating evidence based therapy approaches for children with diagnosed language impairments.

Late talkers' use of gesture and language at 16-months and 6-years of age

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As with typically developing children, language and gesture are closely tied in children with early language delay (late talkers) and school-age children with SLI, but the relationships are different. Late talkers with delays in comprehension and production (LC) use

fewer gestures and are at greater risk for continued language delay than TD and late talkers with normal comprehension (LP) (Thal et al, 1991; Thal, 2000). School-age children with SLI use more representational gestures than TD (Evans et al., 2001). In this presentation we describe communicative gesture use by LC, LP and TD at 16 months and 6 years of age.

Using the MacArthur-Bates CDIs, we identified 38 TD, 37 LP, and 20 LC at 16-months of age. An additional 32 13-month-old TD children served as language-matched controls (16 matched to LP for expressive vocabulary, 16 to LC for receptive and expressive vocabulary). When they were 6 years old 18TD, 11LP and 5LC returned for additional testing.

At 16-months spontaneous communication was assessed in play with a parent (10 minutes) and a trained research assistant (10 minutes) using toys that encourage communication in young children. Percent agreement on 10% of the samples was 84% - 96%. Communicative gestures included deictic (e.g., pointing) and referential (e.g., putting hand to head to indicate putting on a hat) gestures that were directed to the other person and that were not a direct motor act on an object or the other person (consistent with Goldin-Meadow, 2005). At 6 years children retold one short episode of an animated wordless cartoon to a naïve listener after watching it twice on a TV monitor. Gestures were coded as deictic, representational, beat, or metaphoric (following McNeill, 1992). Percent agreement on 18% was 80% - 94%.

At 16-months the two delayed groups and the language-matched controls produced significantly fewer words (F (1,4) 18.04, p .000, η .37), different words (F (1,4) 27.04, p .000, η .47), and utterances (F (1,4) 22.364, p .000, η .42) than TD and did not differ from each other (Tukey .05). LC and comprehension matched controls used significantly fewer communicative gestures than TD (F (1,4) 3.97, p .005, η .11, Tukey .05). LC used significantly fewer different communicative gestures than TD (F (1,4) 3.24, p .02, η .10, Tukey .05).

At 6 years resampling statistics were used to evaluate group performance because of the small number of LP and LC. Twelve TD, 7 LP, and 3LC used gestures in their narrative retells. Results showed no significant differences in overall story completeness using language. However, children who did not use gestures scored higher than those who did on a number of standardized language tests, regardless of group. For those who used gestures, LC used significantly more different representational gestures (p=.05) and used a higher proportion of gestures per utterances (p=.05) than TD. This pattern is consistent with that reported for children with SLI by Evans et al. (2001).

Potential explanations of for these results will be explored in the context of Functionalist models of language acquisition.

Gesture, language, and motor skill in children clinically referred for language impairments

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Evidence for links between language and motor functioning has led researchers to examine language-motor and speech-gesture relationships in children with language impairment (LI). With regard to language-motor links, there are relatively high rates of co-occurrence between motor coordination and language impairments and difficulties in the production of representational gesture in children clinically referred for language (but not motor) concerns. With regard to gesture-speech links, there is some indication that gesture may play a compensatory role in the face of difficulties with expressive language (e.g., Evans, Alibali, & McNeil, 2001). Taken together, these findings present an interesting paradox: despite impairments in motor coordination that might be expected to impact gesture production, children with LI make more extensive use of gestures when communicating. The present study was designed to shed light on this issue by examining relationships between language, gesture, and motor skill in a single group of children who had been clinically referred for LI and a comparison group of same-aged typically-developing (TD) children.

Eleven children with LI between the ages of 2;8 and 4;6 and 16 gender- and age-matched TD children participated. Children with LI had standard language scores at least one standard deviation below the mean on one or both subtests of the Preschool Language Scale-3 (PLS-3) and nonverbal cognitive abilities no more than 1.5 standard deviations below the mean on the Leiter International Performance Scale-Revised Brief IQ Screen (LBIQ). Children were videotaped at home while engaged in two picture narration tasks with a primary caregiver; parent report and observational measures of motor skills were also administered. All of the children's spontaneous speech and gesture were transcribed and coded. Gestures were further classified by type (deictic, iconic, conventional/emblem, beat), and utterances containing both speech and co-occurring gesture were categorized according to the informational relationship between gesture and speech (i.e., whether the gesture provided redundant, disambiguating, or additional information to that conveyed in speech).

Results indicated that children with LI produced gestures at a higher rate than TD peers; they also produced a significantly higher proportion of utterances consisting of gesture alone and were significantly more likely to accompany an unintelligible utterance with gesture. No group differences in gesture type or the informational relationship between gesture and speech were found. In addition, children with LI performed significantly worse than comparison children on measures of fine and gross motor abilities. Finally, regression analyses conducted within the LI group indicated that gesture explained a significant portion of the variance in PLS-3 Expressive Language subtest scores beyond that accounted for by Auditory Comprehension and LBIQ scores.

These findings suggest that children with LI used gesture to compensate for expressive language difficulties despite the presence of difficulties with both gross and fine motor abilities. Results are discussed in terms of the influence of task and communicative context on the extent to which children compensate for language difficulties via gesture and the value of assessments of gesture use and motor abilities as unique sources of information regarding the nature and severity of language impairment.

Putting speech in context with the hands: The role of gestures in Specific Language Impaired children's pragmatic comprehension

Liz Kirk, Karen Pine
University of Hertfordshire

Some children with a specific language impairment (SLI) have difficulty utilising the context in speech. We explored whether the difficulty of children with SLI to make contextual inferences beyond what is explicitly verbalised extends to the non-verbal domain. Short verbal scenarios were developed that require the listener to process contextually relevant information in order to arrive at the intended meaning of the utterance. Questions were designed that required children to make inferences beyond what was explicitly stated verbally in the scenarios. Language impaired children (N = 21) and age matched typically developing children (N = 26) were presented these verbal scenarios in two conditions: speech only and speech and gesture. Presenting speech with complementary gestures helped children, especially those with a language impairment, to utilise the context appropriately. Children with SLI answered significantly more questions correctly when verbal scenarios were accompanied by gesture. Furthermore, children, especially those with SLI, frequently produced the same gestures that they had observed in the gestured verbal scenarios, and were more likely to do so in correct rather than incorrect answers. Gesture offers children with SLI a non-verbal context that is more accessible to them, assisting their comprehension of speech that requires contextual inferences to be made. These findings have implications for teachers and speech and language therapists alike, who could utilise the gestural channel to encourage and support language impaired children to communicate effectively.

How well do children with language impairment produce and understand mime-like gestures?

Nicola Botting[1], Nick Riches[2], Gary Morgan[1]
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Previous research on how language impaired children use and understand gesture paints a mixed picture. Some studies show that this group have impaired gestures (e.g., Hill, 1998), consistent with the notion that speech and gesture is controlled by a single cognitive system (McNeil, 2000). In contrast other research finds that gesture and linguistic abilities are relatively separate in children with LI and even that gesture may act in a compensatory way in comprehension (e.g., Thal et al, 1991).

In this pilot study, novel mime-gesture tasks were employed to assess gesture comprehension and production in children with language impairments. A group of 24 children with language impairment and 19 age peers with typical development (aged between 3;2 and 6;7) participated in the study.

For the comprehension task, which involved the integration of speech and gesture, children with LI (mean=10/26 correct) had significantly lower performance than their peers (mean=15/26 correct). This difference remained significant after correcting for non verbal IQ. For the LI group, nonverbal IQ, expressive and receptive vocabulary was highly correlated with understanding gesture, but fine motor skill was not. For the TD group only expressive language related to performance on the gesture comprehension task.

When an error analysis was undertaken, children with LI were significantly more likely to choose a gesture foil than semantic foil – i.e., when integration of both sources of information failed, they were relying more on the gesture; whereas typically developing children were more likely to choose a semantic alternative – i.e. when integration of both sources of information failed, they were relying more on the speech content and this interaction was significant.

For the production task, which involved a charades type game, children with LI were again reliably less clear than their peers and used different types of gesture to convey meaning. Analyses examining the relationship between gesture comprehension and production and the relationship to language, motor and cognitive skill are ongoing and will be presented. Specifically we are interested in the relationship between gesture production and the comprehension of gesture + speech input, the ways in which these relate to wider language, cognition and motor skills, and whether these relationships are different in clinical and non-clinical populations.

Gestures and words in a naming task: A comparison between children with Down syndrome and typically developing children

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Down syndrome (DS) is a common genetic disorder that affects one in 700-800 live births. It is considered the most frequent cause of intellectual disability. The neuropsychological profile of children with DS is characterized by a lack of developmental homogeneity between cognitive and linguistic abilities: visuo-spatial and visuo-motor skills are relatively preserved (Klein & Mervis, 1999; Paterson, 2001), while linguistic abilities are poorer than what would be expected on the basis of their overall cognitive level (Chapman & Hesketh, 2000). In spite of much work documenting the nature of the language profile displayed by children with DS, relatively few studies have examined the gesture-language system in these children. In this study we examine the relationship between spontaneous gesture production and spoken lexical ability in children with Down syndrome (DS) in a naming task. Fifteen children with DS (3.8 - 8.3 years) were compared to 15 typically developing children matched for developmental age (DATD) (2.6 - 4.3 years) and 15 matched for spoken lexical production (LATD) (1.9-2. 6 years). Compared to DATD children, children with DS were less accurate in speech, but similar to LATD children in the amount of phonologically altered answers and no spoken responses. Although children with DS and TD children not differed on the total number of gestures produced, LATD children produced more bimodal answers, while children with DS more gestures without speech. Interesting differences also appear in the proportion of different types of gesture produced: TD children produced an higher proportion of deictic gestures in respect to the representational one. On the contrary children with DS produced similar proportion of deictic and representational gesture. Finally, the proportion of representational gestures is higher in the DS group in respect to TD children. Our data indicate that different patterns of gesture usage appear consistent with both general cognitive level and with phono-articulatory abilities. Specifically, when deictic gestures are produced these may serve to establish and maintain attention for both producer and listener, and to clarify a spoken production still not clearly comprehensible. This behaviour is more frequent when cognitive and/or language ability is more limited. Representational gestures appear more clearly linked to the general "lexical competence" widely defined (not limited to meanings expressed by spoken modality) and may serve to bring forth semantic knowledge within a visible representation (Kendon, 2004). This result indicates that, at the stage of cognitive and linguistic development here explored, some semantic features of words are still encoded in sensorimotor form (Bates & Dick, 2002; Kelly, et al., 2002), suggesting that the relationship between gesture and word may be related to action because of the representational property of the motor system (Gallese 2000; Rizzolatti & Luppino, 2001).

Symposium Session 8 - Thursday 31 July 16.30 - 18.30
Symposium Number – S8-2

Chair: Petra Schulz, *University of Frankfurt*
Discussant: Ana Pérez-Leroux, *University of Toronto*

Acquiring the semantics and syntax of presuppositions

Description:
We propose a symposium examining how children acquire the ability to compute the semantic presuppositions of various sentence types. The classical definition of presupposition (Strawson, 1952) is that a statement A presupposes a statement B iff B is a precondition for the truth or falsity of A. Presuppositions are thus part of the background assumption of a sentence. Their behaviour differs from typical semantic and pragmatic inferences. Like conventional implicatures, they remain constant under certain modifications of the sentence (e.g., negation). Unlike entailments and like conversational implicatures, they are context sensitive and can be cancelled in certain discourse contexts (e.g., overt denial). Thus, they are not invariant meaning components, but rather require a model that allows for both the required systematic calculation and flexibility necessary when calculating presuppositions. In recent approaches to presupposition (Heim, 1982; van der Sandt, 1989, 1992), they are taken to be part of the informational content of a sentence, tied to specific linguistic expressions, and calculated in a systematic fashion. The defeasibility is modelled in terms of different ways of linking the presupposition to an antecedent in the discourse. Thus, in these models, all presuppositions can be analyzed as definite descriptions, either of an individual or an event (cf. summary in Schulz, 2003).

Presuppositions triggered by definite articles in the NP domain (the king of France), by number as in (The cats are sleeping on the bed); presuppositions in the sentence domain are triggered by factive verbs embedding finite complements (Maria regretted hat she kissed Bert), cleft sentences (It was Bert who kissed Maria), wh-questions, non-restrictive relative-clauses, etc. (cf. Levinson, 1994).

The assumption that all these presupposition-triggers share the property of denoting a definite description makes clear predictions for their acquisition. However, studies on the acquisition of presupposition have so far been restricted to investigating presupposition-triggers in isolation.

Looking at the interplay between cognition and language in the area of presupposition, the development of the Theory of Mind, i.e. the ability to understand false beliefs and to distinguish between thoughts and reality, seems crucial for the difference between presupposition and assertions.

Our aim is twofold: First, we seek to examine the acquisition of presupposition triggers in different domains. Second, we aim to explore the role of the development of Theory of Mind (as a model for common ground reference) for the acquisition of presupposition in general.

Specific questions to be addressed include the following: How children develop presuppositions? How do children integrate propositional meanings with content represented in the common ground of discourse? How does this development depend on cognitive development, understood as growth in the ability to represent semantic models under multiples perspectives, including Theory of Mind development? To what extent does mastery of presuppositional meanings originate from grammatical, pragmatic, or cognitive development?

We present 5 papers bringing together cross-linguistic data from English, German, French, and Spanish. A range of methods including TVJ-tasks, forced-choice, and picture selection, is used to study the acquisition of presupposition associated with grammatical number, factivity, and cleft structures.

Asserting and presupposing grammatical number

Ana Pérez-Leroux
University of Toronto

Grammatical number represents a serious challenge to acquisition theories because morphologically, it is a very early development across languages (Stephany, to appear), they achieve discrimination early in infancy (Kouider 2006). Various recent experimental studies, show that semantically, there are a number of comprehension gaps very late in the preschool years (Sauerland 2003, Pérez-Leroux 2005, de Villiers and Johnson 2004) despite the apparent simplicity and truth functionality of the mappings (sing=one; plural=many).

In Study 1, 25 Spanish speaking children aged 4;2-6;1, and 41 English-speaking children aged 2;7-6;0, were shown two pictures, one of a plural and the other of a singular event, and asked to point to the picture indicated to the utterance. Children hear plural and singular sentences where a) number was expressed both on the subject and the verb (*Los gatos duermen en la cama/The cats are sleeping on the bed*, b) number was masked on the subject but morphologically expressed on the verb (*duermen en la cama/the cats sleep on the bed*), and c) number was asserted via a lexical quantifier (*un gato/one cat* vs. *Muchos gatos/many cats*).

Children showed some advantage related to what was morphologically encoded versus the element with zero morphology (singular in Spanish had lower accuracy than plural; the opposite was true for English verb-only condition). All groups of children, even the youngest, had very high rates of accuracy when number was lexically asserted, rather than grammatically presupposed.

The second study examines the pragmatics of number presupposition, following the methodology in Papafragou's (2006) work on children's understanding of scalar implicatures: under which conditions do children felicitously recognize presupposed rather than asserted grammatical number? We examine various possibilities: a) that the various comprehension challenges arise from potential generic and dependent readings, so that children are understanding the descriptive sentences as generic (and therefore, number neutral in the sense of Farkas & de Swart 2003); that the difficulties are comparable to those that children exhibit with various scalar implicatures, and that under situations where there is an associated cognitive gain, children's performance improves substantially.

Why is it better to treat PL as expressing a presupposition in acquisition?

Christina Schmitt[1], Karen Miller[2]
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Semanticists have devoted a considerable amount of time trying to understand the properties of number morphology and definite noun phrases and how both humans and machines interpret plural and definites. With respect to number and definiteness, the traditional view in acquisition is that number is easy (Brown 1973; Berko 1958, but see recent work by Sauerland 2005; Kouider et al 2006) and definiteness is hard (Karmillof-Smith 1979). With respect to definiteness, there is a consensus that children overuse definites in production and take a long time to use it in comprehension at adult levels. Interestingly, the claims about number as easy-to-acquire come basically from production data (Brown 1973). The traditional results are consistent with the classical semantics that treats plural as having groups in its extension (Chierchia 1998) and definiteness as involving a presupposition of existence and uniqueness (Heim 1991). Recently there has been a shift towards treating number morphology as expressing presuppositions. Farkas & de Swart 2003 treat plurals as presupposing that the DP refers to a group and singular is interpreted as a singleton by default, while Sauerland 2005 treats singular as expressing the presupposition that the DP is a singleton or a mass, while plural is interpreted as a group by an implicature. Presupppositional theories of number raise two questions: first, do children treat number morphology as expressing a presupposition rather than being part of the assertion? Second, why, if both involve presuppositions, would number be acquired much earlier than definiteness? And is it?

The paper has two main parts: In part 1, we compare traditional and presuppositional semantic theories of number in light of acquisition data from Spanish and English. We argue that plural morphology is better treated as expressing the presupposition that the DP refers to a group and singular being interpreted as one by default, rather than plural morphology having a group in its extension as in de Swart and Farkas 2003. Furthermore, we compare the results from the acquisition of definites and number morphology in the noun phrase in experiments from English and Spanish and we argue that definiteness presupposition is acquired later than the plural presupposition. In part 2, we develop a learning model that can explain (i) the production/comprehension asymmetries found in the literature (children's production of plural morphology in the noun phrase reaches adult levels by age two (depending on the quality of the input) but comprehension does not reach adult level until much later) and (ii) why only in certain cases children exhibit the well-known difficulties with presuppositions and implicatures (definites vs. number). The model has four phases: Phase one reduces to distributional learning, which is much more efficient for learning plural morphology than the definite determiner (see also Perez-Leroux et al in prep); in phase 2 all inflectional morphology is treated as presuppositional; phase 3 marks the mastery of presuppositions that depend on explicit domain restrictions; in phase 4 children start to master implicit domain restrictions.

The role of theory of mind in the acquisition of factivity

Petra Schulz, Carolyn Ludwig
[1]*University of Frankfurt,* [2]*University of Mannheim*

This study examined how emergence of *Theory of Mind* (ToM), i.e. the ability to attribute a false belief (FB) to another person, contributes to the acquisition of presuppositions triggered by factive (1), but not by non-factive verbs (2):
(1)Tom forgot that he bought ice-cream.
(2)Bill thought that she bought ice-cream.

In order to correctly interpret these sentences, the child has to process the embedded structure and has to realize that the truth-value of the embedded proposition may be indeterminate (2), or that the truth of the embedded proposition may be presupposed (1). The Linguistic Determinism Hypothesis (LDH, deVilliers,2000) postulates that syntax of complementation is a prerequisite to the child's mastery of FB understanding. Supporting the LDH, previous studies found that FB-passers, unlike FB-failers, perform target-like on a memory-for-complements task with non-factive verbs like *think* and *say* (deVilliers&Pyers, 1997, 2002).

Factive and non-factive sentences differ wrt the truth-value of the embedded proposition, but share the same syntactic structure. Schulz (2003) hypothesized that the emerging sensitivity to the difference between belief and facts also paves the way for an understanding of the semantics of factive complements. A pilot study found that FB-passers showed better understanding of factive complements than FB-failers (Meissner,2002). However, a memory-for-complements task was not administered, and the wide age range confounded the results.

Therefore, the current study tested the relation between FB and understanding presuppositions in factive complements, using a standard FB-test, a memory-for-complements-task (deVilliers&Pyers,2002), and a factivity-test (Schulz,2003). 15 normally-developing monolingual German-speaking children (3;05-4;10, mean age=4;0) and 15 adults participated. In the FB-test, subjects were presented with 12 test-items, 6 *change-of-location* and 6 *change-of-contents* tasks. Using a passing criterion of 80% correct, 7 children (mean age=4;0) were classified as FB-failers and 8 children (mean age=4;04) as FB-passers.

In the memory-for-complements-task, subjects saw 8 picture-sequences involving mistaken statements (e.g., *Lisa said there was a bug, but it was just a raisin*) and were then asked a *wh*-question *(*e.g., *What did Lisa say was in her cereal?*). While all FB-passers performed adult-like (97% correct), FB-failers performed significantly worse (70% correct, range: 0-8 items correct).

In the factivity-test, designed as a truth-value-judgment-task, subjects heard 12 complex sentences like (1) and (2), accompanied by a picture, and were asked a *yes/no*-question (*Did she buy ice-cream?*), assessing the child's ability to assign truth-values to the complement. Regarding non-factives, FB-passers performed significantly better than FB-failers: Incorrect *yes*-answers decreased from 36% to 13%. Regarding factive structures, performance of FB-failers and FB-passers also differed significantly. However, contrary to our hypothesis, the number of target-like *yes*-responses decreased from 90% to 66%. Given that a *yes*-answer can also result from a complement-only-strategy, FB-passers' but not FB-failers' performance may reflect an adult-like interpretation.

In summary, the results substantiate the LDH: Mastery of the syntax of non-factive complements is a prerequisite for FB-understanding in German-speaking children. Furthermore, emergence of ToM contributes to children's understanding of the non-presuppositional character of non-factive and the presupposition triggered by factive verbs, while a truly adult-like interpretation of factive structures is achieved later.

Factivity under negation: The acquisition of two types of presuppositions

Tom Roeper
University of Massachusetts, Amherst

When does a child grasp a proposition? When is a proposition a presupposition in a child's understanding? The child's early shift from small clauses (he big) to tensed clauses (he is big) may be a shift to a propositional representation but it is difficult to say.

Green and Roeper (2007) have argued that propositions become presuppositions that can be maintained or lifted when inversion occurs in AAE and in child language. The adult contrast in presupposition between *Why don't you go outside* and *How come you don't go outside* is a clue to what children do when they fail to invert, primarily with *why*.

In addition work on wh-extraction persistently shows that children assume the truth of embedded clauses (see deVilliers et al (2007) and Oiry (2008)). These perspectives indicate that the semantics of subordination are a crucial axis for how the grammar develops. Finally In addition, implicatures represent another dimension where presuppositions are pragmatically generated by children. We will raise questions about whether or not these dimensions are linked in the acquisition process.

Children's acquisition of exhaustivity in clefts

Tanja Heizmann
University of Massachusetts

This paper reports experimental results showing that children initially differ from adults in the interpretation of cleft constructions. Adults interpret the cleft in (1) as being exhaustive, i.e. the presupposition is that the only item that was eaten is *a sandwich* (c.f. Percus (1997), Kiss (1998), Hedberg (2000)). In a situation where *John* ate *a sandwich, a cookie* and *a banana,* (1) is not appropriate since it does not list all the items that have been eaten. The same observation holds for equivalent German examples.

(1) It was the sandwich that John ate.
clefted constituent

An unstudied domain is how and when children realize the exhaustivity of clefts. This paper shows that there is an initial stage in child language, in English as well as in German, where children are non-exhaustive in clefts.

Literature proposes that exhaustivity comes about by an underlying definite description in clefts, Percus (1997), Hedberg (2000). In comparing acquisition data from clefts with questions, which share the exhaustivity property, and overt definite descriptions, I propose that the actual acquisition task is even more intricate than thought. Clefts display hybrid properties covering a definite description property, more commonly known as maximality, as well as an exhaustivity property making it necessary to keep these two concepts theoretically apart although they look alike in their definitions, i.e. both concepts refer to some notion of a 'complete' set.

A comprehension study in form of a Truth-Value-Judgment Task was conducted with 3 to 6-year old children. The task included 5 tokens of exhaustive clefts and 5 tokens of non-exhaustive clefts. 6 tokens in default canonical argument form were included as controls, 3 yes-controls and 3 no-controls, making up a total of 16 stories. 52 American children and 41 German children were tested.

The results show that younger children interpret clefts to be non-exhaustive, i.e. violations in exhaustivity are tolerated by younger children but not by adults. For German a significant effect of target was found ($F(1,37) = 67.7$, $p<0.001$), comparing exhaustive and non-exhaustive clefts. Furthermore a significant effect of age across the four age groups, 3, 4, 5 and 6-year-olds, was found ($F(3,37) = 13.5$, $p<0.001$), showing that children start out in a non-exhaustive stage and are almost adult like by age 6. Finally, a significant

interaction was found between target and age ($F(3,37) = 12.5$, $p<0.001$). The same conclusion can be drawn for English with a significant effect of target ($F(1,48) = 48.5$, $p<0.001$). The age effect is marginal for English ($F(3,48) = 2.7$, $p = 0.059$). However there was again a significant interaction effect parallel to German with ($F(3,48) = 2.9$, $p = 0.044$).

It is concluded that theory needs to treat clefts on par with questions rather than definite descriptions because the acquisition of exhaustivity in clefts and questions proceeds on a different track than the acquisition of maximality in definite descriptions. So far this fact has been masked by the effect that theory has assumed that exhaustivity and maximality are more or less the same property.

Symposium Session 8 - Thursday 31 July 16.30 - 18.30
Symposium Number – S8-3

Chair: Sharon Unsworth, *Utrecht University*
Discussant: Aafke Hulk, *University of Amsterdam*

Investigating the linguistic development of early successive bilinguals

Description:
There is broad consensus in the literature that bilingual first language (2L1) acquisition proceeds in a similar fashion to monolingual L1 acquisition (Meisel 2004): simultaneous bilingual and monolingual children pass through similar developmental stages and ultimately become native speakers of the language(s) in question. Adult second language (L2) acquisition, on the other hand, is known to be considerably more problematic: it is often subject to L1 influence and adult learners regularly stop short of nativelike levels of attainment (White 2003).

In terms of population characteristics, child L2 acquisition falls somewhere between these two groups: L2 children differ from 2L1 children because, at the start of the acquisition process, they are older and consequently already know another language. They by definition differ from L2 adults in terms of age at first exposure. Generally, it is assumed that L2 children are more successful than L2 adults, and this differential success is often taken as evidence for a critical period for language acquisition. The cut-off point for such a critical period has been subject to considerable debate: various ages have been put forward, ranging from age 5 (Krashen 1975) to puberty (Lenneberg 1967). Recently, it has been suggested that the optimal period for language acquisition is before age 3 (Meisel 2007, Rothweiler 2006). Much of the research on child L2 acquisition, however, focuses on children who are exposed to L2 at age 4 or older (see Paradis 2007 and Unsworth 2005 for recent reviews). This symposium examines the linguistic development of the largely under-researched population of 'early successive bilinguals', that is, children who are first exposed to an L2 between the ages of approximately 1 and 4 years old. This group will be compared and contrasted with children with age of first exposure older than 4, simultaneous bilingual children and monolinguals, not only to address the question of whether there is evidence for a critical period with decline starting at age 3 to 4, but also to investigate the following questions:
— To what extent do early successive bilinguals differ from 2L1 children and L2 children and adults in terms of their development and/or ultimate attainment?
— How early is early enough for successful L2 acquisition to take place?
— Is there evidence for different critical periods for different linguistic domains?

The symposium consists of four papers (20 mins plus 5 mins discussion) which present original data from early successive bilinguals with a range of L1s (Turkish, Russian, Tunisian Arabic, French, Swedish) and L2s (German, French), detailing the acquisition of a variety of linguistic phenomena, including verbal classes and the use of fillers, case morphology, verbal morphology, subject and object clitics and grammatical gender. The papers will be followed by a general discussion (20 mins) led by Prof. Aafke Hulk (University of Amsterdam).

Morphological development in early child second language acquisition

Jürgen Meisel[1,2]
[1]*University of Hamburg,* [2]*University of Calgary*

Recent findings suggest that successive language acquisition may result in qualitative differences as compared to monolingual (L1) or bilingual (2L1) first language development if age of onset of acquisition (AOA) happens at around age 3;6 or later; cf. Meisel (2004), Rothweiler (2006). This has been argued to be caused by maturational changes, i.e. optimal developmental periods during which grammatical properties are easily and successfully integrated into the child's developing grammar seem to begin to fade out earlier than is commonly believed. We lack, however, a principled account explaining which phenomena are affected at such an early age. If Towell & Hawkins (1994) and Smith & Tsimpli (1995) are correct in assuming that only parameterized principles are subject to maturation, we should find that child L2 differ from (2)L1 learners in just those areas of grammar which are related to parameters of Universal Grammar (UG). From this it can further be deduced that syntax should be the component primarily affected by these changes, i.e. syntactic variation depending on the presence of uninterpretable features in functional heads. These considerations appear to corroborate the claim by Schwartz (2004) according to which child L2 behave like adult L2 learners and differently from L1 children in the acquisition of syntax, whereas in inflectional morphology, child L2 are distinct from L2 and similar to L1.

Several recent studies suggest, however, that it is precisely in inflectional morphology where child L2 resemble adult L2 learners and behave differently, as compared to (2)L1 children; Hulk & Cornips (2006), Kroffke, Rothweiler & Babur (2007) and Meisel (2006, 2008). I intend to explore further the role of inflectional morphology, contrasting the course of acquisition in child L2 to (2)L1 and adult L2; the question of ultimate attainment will not be addressed. The focus will be on the acquisition of gender markings by German children (age of onset: 2;2 - 4;0) acquiring French in an institutional setting. My hypothesis, based on a preliminary analysis of data in our corpus, is that a number of these children fail to acquire gender marking as a grammatically phenomenon; they resemble, in this respect, adult L2 learners. Some of the children, however, seem to behave like (2)L1 learners. My conclusions are that 1) inflectional morphology is one of the areas of grammar distinguishing (2)L1 from L2; 2) the age range investigated represents a critical period for the development of the phenomena studied. 3) Based on the assumption that gender concord but not gender assignment depends on parameterized options, I claim that other aspects of the human language faculty, not only those related to UG parameters, are also subject to maturational changes. More specifically, certain discovery principles operative in L1 development are affected by maturational changes. I suggest that in more mature learners competing cognitive resources interfere with those available in L1 development, and that success in L2 acquisition depends partially on an individual's success in inhibiting competing resources.

Fine-tuning the differences between double L1 and early L2

Ira Gawlitzek, Dieter Thoma, Rosemarie Tracy
University of Mannheim

The comparison of how verb placement and finiteness for German develop in children with simultaneous acquisition and those who start to learn German as an L2 at an early age (3 to 5 years) shows virtually no qualitative difference between these two learner groups. Verb placement and finiteness in German develop hand in hand, and lexical verbs are the driving force in this development.

In our contribution we will address two aspects which contribute to the discussion of whether and to what extent early successive bilinguals (early L2ers) differ from children simultaneously acquiring two languages (2L1ers) in terms of their development and/or ultimate attainment. We will present a detailed analysis of how the different verbal classes (lexical, modal, auxiliary) develop and investigate what their potential contribution is to the overall syntactic development. In addition, we will also investigate the role of fillers. The use of fillers as in (1)-(3) is well documented for developmental grammars of monolingual learners and also to a certain extent for 2L1ers.*

(1) *ene* [= FILLER] fish tot is \ Max (3;0.16)
"the fish is dead"
(2) *nene* [= FILLER] schneller polizisten holen müssen \ Max (3;0.16)
"must get the policemen quicker"
(3) if [=ob] ich hab ein coat \ Hannah (2;1.13)
"if I have a coat"

However, fillers seem to be substantially less frequent in early L2. In particular, the acquisition of the morphological details in determiners seems to follow different patterns and may display different learning strategies. In L1 learners we find few deviations in gender marking and well-documented systematic deviances in case marking. However, in early L2 gender seems to be a particular challenge while case marking develops probably in a comparable way to L1. The sparse use of fillers in determiner positions possibly mirrors the application of monitoring strategies which cause early L2ers to minimise overt lexical code-switching in L2 contexts (typically less than 2% of their L2 sentences contain L1 words). However, many 2L1ers, who can equally well control their language choice, switch and mix considerably. Are these distinctions due to the different ages of the learners or to other variables?

To address this question, we will investigate and present data from longitudinal studies with bilingual German/English children and from migrant children from different L1 backgrounds (Tunisian Arabic, Russian, and Turkish) who were first exposed to German as L2 upon entering kindergarten.

*The abstract submission procedure precludes the use of phonetic font; for this reason, the fillers are rendered in Roman script here. The 'e' should be interpreted as a schwa.

Verbal inflection, case morphology and the acquisition of sentence structure in early successive bilinguals

Monika Rothweiler
University of Hamburg

One of the main tasks in research on child L2 is to disentangle in which domains these children follow L1-like or L2-like patterns. This is important if we want to elaborate on the hypothesis of a critical period in language acquisition (cf. Meisel 2007). Assuming that language-specific learning algorithms or parameterized UG-principles are accessible only for a certain period, the question arises whether there are distinct periods for different parts of language or even for different grammatical subdomains.

Recent studies have shown that the acquisition of V2 in German is acquired in a targetlike fashion in successive acquisition if the children start to acquire German at age three or earlier (Kroffke 2006; Rothweiler 2006; Thoma & Tracy 2006). This is in contrast to adult L2 learners of German (Meisel 1997). Whether early successive acquisition is just a variant of 2L1 has to be investigated in more detail. Schwartz (2004), for example, proposes that L2 children acquire morphology like L1 learners, while syntactic structures are acquired in a similar fashion to L2 adults. Although this dissociation was not found in the acquisition of verbal morphology (subject-verb agreement) and sentence structure (V2, subordinate clauses) by children whose age of onset was 3 years, more grammatical subdomains have to be studied. In particular, it is necessary to take a closer look at those grammatical subdomains which are developmentally linked in some way in L1 acquisition. This holds for example for the acquisition of nominative case (in the DP) and IP.

This paper will focus on results from successive bilinguals (age of onset = 3) with Turkish as L1 and German as L2. Like verbal morphology, subject-verb agreement and V2, the acquisition of case morphology in this group patterns similarly to L1 acquisition. The sequence in which the different case markings are acquired is the same as in L1 acquisition, and this includes the existence of generalisations similar to those made by L1 children. As in L1 acquisition, nominative markings are acquired first, and morphological accusative and dative case do not occur before the acquisition of sentence structure.

This study of case morphology delivers further evidence for the claim that child L2 (with age of onset at 3) is like 2L1 in central grammatical domains.

Is child L2 French like 2L1 or like adult L2?

Suzanne Schlyter, Jonas Granfeldt
Lund University

In the study of the specificity of child L2 acquisition, previous research has been concerned with a variety of different comparisons. The comparisons have, however, not been entirely complete or completely controlled within a single study. On the one hand, child L2 has been compared to adult L2 (Prévost), but without pursuing the comparison to include L1 or 2L1. On the other hand, child L2 has been compared to 2L1 (Meisel forthcoming) and/or to L1 (Paradis 2007), but without including a comparison with adult L2 where the other language is held constant. Studies comparing child L2 with both 2L1 and adult L2 where the same language combination is involved are rather rare. Importantly, the two languages may influence each other in different developmental aspects (Hulk and Müller, 2000), which underlines the need for controlling "the other language" factor across other comparisons.

Furthermore, since child L2 has shown to display both similarities and differences with as well adult L2 as (2)L1, a complete comparison in both directions is important in order to develop a more precise understanding of the exact nature of chL2 (see Unsworth 2005).

Following our previous work on Swedish-French 2L1 children and Swedish adult L2 learners of French, we have access to a database and previous results that allow more complete and controlled comparisons (Granfeldt 2003, 2005 on articles and adjectives; Schlyter 2003 on verbs, 2005 on adverbs; Granfeldt & Schlyter 2004 on object clitics). With the background of these studies, we have chosen certain phenomena where there are clear differences between the 2L1 and the adult L2 learners, to study them on a new group of child L2 learners. These are compared to 2L1 learners and to monolingual controls. All subgroups were matched for age/school class

and for general proficiency using MLU and a vocabulary diversity measure. All children came from the same school and had similar input.

In this paper we concentrate on non-finite verb forms, subject-verb agreement and subject and object clitics, which all have been extensively studied not only by us but also by previous research on the acquisition of French. For most of the phenomena under study, we claim that the child L2 learners, even those with age of onset between 3 and 4 years, pattern more with the adult L2 learners than with any matched 2L1 learners. This supports a position where an age of onset (of French) at about 3-4 years is still clearly different from a still earlier age of onset as seen in the simultaneous bilinguals 2L1, acquiring French and Swedish from birth - not only the age-matched children but also the 2L1 children at younger ages from our previous studies.

With respect to other linguistic features, however, preliminary results also suggest that the L2 children may not pattern with L2 adults but rather with 2L1 children. We will address the question if these similarities appear in the children with an age of onset before or after the age of around 4 years.

Symposium Session 8 - Thursday 31 July 16.30 - 18.30
Symposium Number – S8-4

Chair: Barbara Hoehle, *University of Potsdam,* Thierre Nazzi, *CNRS-Université Paris Descartes*
Discussant: Jurgen Weissenborn, *Humboldt University*

Crosslinguistic perspectives on word segmentation

Description:
Recent research suggests that word segmentation procedures infants develop are varying across languages and that this variation is in large part determined by the rhythmic type of the native language. Thus, while learners of stress-timed languages like English, Dutch or German use a metrical segmentation procedure based on the trochaic foot (Höhle, 2002; Houston et al., 2000, Jusczyk et al., 1999), learners of syllable-timed French have been shown to start segmentation based on the syllable (Nazzi et al., 2006). This symposium brings together new research on the development of segmentation skills in children learning various typologically different anguages: Catalan, French, German, Japanese, Turkish and Spanish. In addition to typological impacts, segmentation skills in bilingual children and in dialectal variations of the same language will be considered.

Paper 1 presents data from Spanish and Catalan, two syllable-timed languages that in - contrast to French - both allow word-initial stress but differ with respect to typical word length (Catalan having more monosyllabic words than Spanish). Monolingual Spanish and bilingual Spanish-Catalan infants were tested on monosyllabic word segmentation. No group differences were found, suggesting that the differences between the two languages in typical word length do not interfere with word segmentation skills in the bilingual learners.

Paper 2 presents a study on segmentation in mora-timed Japanese (the first study on this language rhythmic class). The results show that 9- and 11-month-olds are able to segment three moraic words out of continuous speech but only when these words show a syllabic structure that is of high frequency in infant directed speech. In addition, evidence will be presented that certain high frequent suffixes support word segmentation. Thus for Japanese learners, prosodic as well as morphological information provides relevant segmentation cues.

Paper 3 contrasts word segmentation by infants learning two dialectal variations (Canadian versus Parisian) of syllable-timed French, using two series of Parisian French stimuli. The first less-intonated series revealed the same pattern for both populations, that is, no bisyllabic word segmentation before 12 months. For the second more-intonated series, bisyllabic segmentation was found at 8 months for Canadian French learners, but again not before 12 months for Parisian French learners. This suggests dialectal variations in the cues used for early segmentation.

Paper 4 focuses on the use of vowel harmony as a cue to word boundaries in Turkish and German learners. In addition to word stress, always final in Turkish, vowel harmony provides a powerful distributional cue in this language, as all vowels within a word have to belong to the same harmony class. It will be shown that Turkish but not German 6-month-olds prefer bisyllabic harmonic compared to bisyllabic non-harmonic words. At the age of 9 months, Turkish infants use the rupture of harmony between two adjacent syllables as an indicator of a word boundary. These results confirm crosslinguistic differences in segmentation and infants' early sensitivity to specific native segmentation cues.
Jürgen Weissenborn will be an additional discussant in the symposium.

Vowel harmony as a potential cue for word segmentation: Findings from German and Turkish 6- and 9-month-olds

Anja van Kampen[1], Güliz Parmaksiz[2], Barbara Hoehle[1]
[1]University of Potsdam, [2]Humboldt University

Though a lot of research has provided evidence that word segmentation in early language acquisition is aided by metrical and segmental statistical cues (e.g. Jusczyk et al., 1999; Saffran et al., 1996), our knowledge on how these different cues and their interactions might be shaped by the specific linguistic properties of the target language is still sparse. In this paper we will report on results of a study focusing on word segmentation in Turkish infants. Compared to the languages looked upon before Turkish has two interesting features. First, Turkish contains vowel harmony; all vowels within one word have to belong to the same harmony class. This provides the learner with a natural statistical cue to word boundaries. Second, Turkish words have main stress on the final syllable in most cases. This offers a consistent metrical cue appearing word final and not initial as in most of the languages studied before

A first experiment examined if 6-month-old children learning a language characterized by vowel harmony are sensitive for this feature. Using the headturn preference paradigm (HTP) 40 Turkish and 40 German 6-month-olds were presented with bisyllabic pseudowords, half of them with harmonic (e.g. *paroz*) half with non-harmonic vowels (e.g. *dünamm*), according to Turkish harmony classes. Since German has no vowel harmony, German infants are not expected to show any preferences for either harmonic or non harmonic pseudowords while we expect a preference for the harmonic stimuli by the Turkish infants.

Turkish children listened significantly longer to the harmonic than to the non-harmonic items while German infants made no difference. This shows that sensitivity for vowel harmony is present at a very young age but only in those children whose target language shows this phonological property.

A second HTP experiment dealt with the use of vowel harmony and word stress for word segmentation by Turkish learners. 32 9-month-olds were familiarized with three-syllabic sequences stressed on the final syllable. The ultimate and penultimate syllables of these strings contained harmonic vowels. The first syllable was either harmonic or non-harmonic to them and either stressed or non-stressed with the two factors being crossed (e.g. *tupaROZ, tüpaROZ, TUpaROZ, TÜpaROZ*). During the test phase infants were presented only with a bisyllabic sequence consisting of the ultimate and penultimate syllable (e.g. *paROZ*). We found a significant main effect for vowel harmony and a marginal effect for stress but no interaction between these factors, i.e. children showed longer listening times to those bisyllabics familiarized with a non-harmonic initial syllable and to those bisyllabics familiarized with a stressed initial syllable. This suggests that Turkish learners use vowel harmony as well as prosodic cues for segmentation without a clear dominance

of one cue over the other. Our data provide evidence that infants as young as 6 months selectively respond to those statistical features that play a role in the phonological system of their language. In addition our findings show that the segmentation strategies children use are adapted to the specific cues the target language provides from early on.

Differences in the development of speech segmentation abilities in two French dialects

Thierry Nazzi[1], Karima Mersad[1], Galina Iakimova[1], Megha Sundara[2], Linda Polka[3]
[1]CNRS-Université Paris Descartes, [2]UCLA, [3]McGill University

We will present data on the early development of speech segmentation abilities in French-learning infants growing up either in Paris or in Montreal. The importance of studying word segmentation in French comes from the finding that English-learning infants use various word boundary cues, many of which are language-specific. One of the most important cues used by young English infants is a prosodic/rhythmic cue: these infants segment fluent speech into trochaic units, which correspond to the rhythmic unit of English. This trochaic-based segmentation procedure would not be useful for French as lexical accentuation is weakly marked and word-final in French, and the rhythmic unit in French is the syllable. Thus, the development of word segmentation in French should follow a different trajectory in which individual syllables play a more important role.

Previous studies have found apparently diverging results for Parisian and Canadian French infants. Nazzi et al. (2006) provided evidence of initial syllabic segmentation: Parisian infants started segmenting syllables between 8 and 12 months of age, and whole bisyllabic words between 12 and 16 months of age. On the other hand, Polka and Sundara (2003) found that Canadian infants segment (whole?) bisyllabic words at 8 months when presented with Canadian or Parisian French stimuli. However, the stimuli used in both studies were different. Acoustic analyses revealed prosodic differences that could be attributed both to dialectal and speech style (degree of infant-directedness) variations. Thus, in order to determine whether the differences reported by Nazzi et al. (2006) and Polka and Sundara (2003) are due to differences in the experimental stimuli or whether they signal processing differences due to different dialectal backgrounds, both research teams tested their infant population with the stimuli originally used by the other team.

The results suggest a complex interaction between specific stimuli and dialectal effects. Canadian infants tested with the Nazzi et al. (2006) stimuli behaved like Parisian infants: emergence of whole bisyllabic segmentation between 12 and 16 months, and syllabic segmentation at 12 months. But on the other hand, Parisian infants failed to segment the bisyllabic words in Polka and Sundara (2003) Parisian French stimuli at both 8 and 12 months (while preliminary results suggest that succeed at 16 months). At 8 months, they also failed with the Canadian stimuli. However, at 8 months, if infants are first familiarized with the passages and then tested on the target words, a segmentation effect is found with Polka and Sundara (2003) Parisian French stimuli. These cross-dialectal results will be discussed in reference to infants' possible combined use of several word segmentation cues: rhythmic/syllabic cues, other prosodic cues, distributional cues.

Early word segmentation in Spanish: Monolingual and bilingual data

Laura Bosch, Melània Figueras, Marta Ramon Casas
University of Barcelona

The pioneer word segmentation studies developed by P.W. Jusczyk back in the nineties clearly established that this ability was present in 7 ½ -month-old English-learning infants (Jusczyk & Aslin, 1995); subsequent research revealed how different types of cues interplay and result in more mature and efficient strategies by the end of the first year of life. At the same time, studies with infants exposed to languages other than English were undertaken and as a consequence a more complete picture of these abilities has emerged, revealing time-course differences that can be related to the specific rhythmic properties of the languages under study (see Nazzi et al, 2006, for data in French diverging from English results when segmentation for disyllabic items is tested). Besides cross-linguistic comparisons, another input variable that must be considered in this domain is bilingual exposure. Word segmentation skills were explored in French-English bilingual infants (Polka & Sundara, 2002) and results revealed no differences compared to monolinguals', even though the ambient languages in this bilingual study differ in terms of their prosodic nature. The present contribution extends the knowledge on bilinguals' word segmentation abilities for languages that share rhythmic (syllable-timed type) properties. Results from a comparison between monolingual Spanish and bilingual Spanish-Catalan 8-month-old infants in a segmentation task on monosyllabic words will be presented.

Spanish is a Romance, syllable-timed language that can be considered to have a trochaic rhythm like Catalan, but it differs from it in terms words' syllabic structure. Spanish has content words varying in length, from monosyllabic to polysyllabic units, but disyllabic words are, by far, the most frequent word structure in Spanish. The same is true for Catalan, although in this language around 27% of content words are monosyllabic and only 19% are tri- or polysyllabic words (Guasti & Gavarró, 2003), figures that are reverted in the case of Spanish, where tri-syllabic words are more frequent than monosyllables. Two groups of participants, half from monolingual families and half from Spanish-Catalan environments were studied using the familiarization-preference procedure, being familiarized to passages and tested on words. Spanish was the language used in these experiments. Results show that both groups are able to recognise the words presented within the passages by listening longer to the non-familiarised words in the test phase. While no differences between both linguistic groups were observed, thus replicating previous segmentation data from English-French bilinguals at a similar age, the response pattern differs from the one that is usually obtained in studies using this methodology. Data will be discussed in terms of the monosyllabic nature of the target words and the easiness of the task for languages where the syllable is the relevant segmentation unit.

Cues from infant-directed speech for word segmentation in Japanese

Akiko Hayashi[1], Reiko Mazuka[2,3]
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Segmenting word-like unit from continuous speech is a critical task which infants need to perform for lexical acquisition. Research with English- and French-learning infants has suggested that infants may rely heavily on the rhythmic properties of their language (i.e., strong-weak syllabic stress alternation in English [Jusczyk et al., 1999; Houston et al, 2000; Thiessen & Saffran, 2003], but syllable-length in French [Nazzi et al., 2006]). Japanese is a mora-timed language, which is usually assumed to be the third rhythm class. Yet, previous studies have suggested that the mora may not be a unit which infants can access easily (Bertoncini et al, 1995), and it seems unlikely that Japanese infants would use "morae" as a basis for speech segmentation.

In this paper, we investigated what cues Japanese infants may use in speech segmentation. We focused on prosodic and morphological cues that are present in Japanese infant-directed speech. In the first set of experiments, we tested the role of a specific prosodic form observed frequently in the vocabulary that Japanese adults use when talking to infants and young children: three mora, heavy-light (HL) bisyllabic words (Mazuka, Kondo & Hayashi, in press). Japanese infants of 5-, 7-, 9- and 11-months of age were first familiarized with 4 passages of 45 seconds each, in which 3 nonsense words appeared frequently. For half the infants, the critical words fit the infant-directed vocabulary form (IDV group), e.g. /paQta/, /keNne/, and /yoRro/. The other half were presented with three mora, three syllable LLL words (e.g., /parita/, /kemone/ and /yokaro/), which are most frequent in adult Japanese (ADV group). During

the test phase infants in the IDV group were presented with familiar and novel words in HL form, while those in the ADV group were presented with familiar and novel words of LLL form. Results show that infants in IDV group had a significant preference for the familiar words at 9 months of age, a novelty preference at 11 months, but no preference at the younger ages. Infants in ADV group on the other hand showed no preference to either list at any age group. These results suggest that the prosodic form of infant-directed vocabulary facilitates word segmentation by Japanese infants.

In a second set of experiments, we investigated whether or not a morphological cue that occurs frequently in infant-directed speech can facilitate speech segmentation (Bortfeld, et al., 2005). Certain suffixes (-chan or -san) occur frequently in infant-directed speech when referring to people or animals. Target words for the ADV group in Experiment 1 were presented with the suffix "-chan." Seven-, nince- and eleven-month-old infants were tested in the same procedure as in Experiment I. Nine-month-olds showed a significant preference for the familiar words and 11-month-olds showed a significant preference for the novel words, but 7-month-olds did not show any preference.

The results of Experiments I and II show that prosodic and morphological cues that are present in Japanese infant-directed speech facilitate segmentation of word-like units by Japanese infants. It also suggests, however, that without the aid of the additional cues Japanese infants were unable to segment 3 mora, LLL words even at 11 months of age.

Symposium Session 8 - Thursday 31 July 16.30 - 18.30
Symposium Number – S8-5

Chair: Hannah De Mulder, *UiL OTS- Utrecht University*
Discussant: Charlie Lewis, *Lancaster University*

Theory of mind and linguistic development: How they do (and do not) relate

Description:
The development of a Theory of Mind (ToM) in the young child has generated a considerable body of research over the past few decades. Between the child's third and fifth year, she goes from having a very limited understanding of other peoples' beliefs, especially if they are contrary to her own belief, to being able to assess another person's knowledge state in a considerably more adult-like way. The role that linguistic development plays in the development of this capacity is the topic of much debate. That there is a relationship between ToM and linguistic development is generally accepted; the nature of this relationship is, however, considerably less clear (Astington & Baird 2005; Milligan et al. 2007).

Various proposals have been offered regarding which aspects of language are of key importance in the development of a ToM. Following the discourse view (Peterson and Siegal 2000), the role of language may only be indirect in ToM development. The child becomes capable of understanding other people's mental states by experiencing the intricacies of conversation (with its shifts in perspective and talk about mental states); language thus plays a facilitating role in ToM development. Other researchers have claimed that language plays a more direct role in ToM development: only once the child's general language abilities are sufficient, is she able to represent other peoples' mental states properly (cf. Astington and Jenkins 1999). A more specific linguistic proposal has been offered by de Villiers and colleagues (de Villiers & Pyers 2002). They claim that understanding of sentential complementation ("John thinks that Mary is washing her hair") is a pre-requisite for the development of a full ToM. These structures allow the overall statement to be true, whilst the complement (Mary is washing her hair) can be false. Understanding of this structure, it is claimed, gives the child a format for representing false beliefs and hence is necessary for the child to be able to develop a ToM.

This symposium seeks to add to this discussion on the role of language in ToM development by presenting novel experimental data that relate to these issues. The first talk, will discuss an experiment on language-delayed deaf children that demonstrates that understanding of false beliefs can be predicted by a child's understanding of sentential complementation. In contrast to this talk, the second talk will present intervention studies that show that training on sentential complements, wh-questions or yes/no questions does not improve ToM understanding. Discourse involving varying perspectives, on the other hand, is claimed to be necessary for the child to reach ToM understanding. Like the second talk, the third talk provides evidence that there is no specific aspect of language that contributes to ToM understanding. However, on the basis of a longitudinal study on mother-child interaction, it is claimed that general language abilities are related to ToM understanding. After the three talks, a discussant will critically review these different findings and theoretical perspectives and offer other ways in which to consider the issues at hand.

Teasing apart the effects of language and executive functioning on the acquisition of implicit and explicit false belief reasoning

Peter de Villiers, Katherine Magaziner, Wendy Roman, Kelsey Sunderland
Smith College

Much recent research explores roles of language acquisition and executive functions in the development of false belief reasoning in children's theory of mind. However, the exact relationships between language or EF and ToM are much disputed. Which aspects of language are important and how language input and the child's own language skills impact ToM development are still unclear (Astington & Baird, 2005). Similarly, different components of EF correlate with FB reasoning (Hughes, 2002).

Study of deaf children allows separation of the effects of EF development and language on the children's ToM. Deaf children with hearing parents are often language delayed, but have normal non-verbal intelligence and active sociability. Woolfe et al (2002) and de Villiers (2005) reported that both signing and oral deaf children were unimpaired on several EF tasks.

We gave 45 oral deaf children aged 4;6 to 7;11 and 45 normally-hearing control children aged 3;6 to 5;11 a battery of EF and language assessments and tested their reasoning about false beliefs in both standard verbal tasks and low-verbal tasks. In addition, the children played two low-verbal deception games.

FB reasoning tests included two unseen location change stories and two unexpected contents boxes. The thought bubble low-verbal task used by Woolfe et al (2002) was adapted and a new thought bubble version of the surprised-face task used by de Villiers & Pyers (2001) and Schick et al (2007 was developed. Deception tasks included a sticker-in-the-hand game and two deceptive pointing games (Carlson & Moses, 2001). For language, expressive vocabulary (EOWPVT-R) and general syntax comprehension (RITLS) were tested. Processing of sentential complement clauses with "say" verbs was assessed by the task used by de Villiers & Pyers (2002). For EF, non-verbal working memory for sequences was tested by Knox's Cube Test. Two inhibitory control tasks were administered; the Day-Night STROOP and the Knock-Tap Hand Game, and all children did a Dimensional Card Sort task.

Relative to age-matched normally-hearing peers, the oral deaf children were significantly delayed in language and FB reasoning, but were on age level on all the EF tasks and the deception games. For the hearing children, language and EF measures predicted both deception and FB reasoning and could not be teased apart as predictors. But for the deaf children, FB reasoning on both highly verbal and low-verbal tests was significantly predicted by language skills, but not by any of the EF measures. In contrast, their performance on the deception games was predicted by inhibitory control, not by language. Regression analyses revealed that

complement comprehension was a differential predictor over other language measures for both verbal FB reasoning (*B*=.33, p=.016) and low verbal FB tasks (*B*=.51, p=.001).

We conclude that language skills (especially comprehension of sentential complements) but not EF are the proximal predictors of changes in explicit FB reasoning, where the contents of a person's FB need to be represented. However, deception games may be solved at a more implicit level of behavioral reasoning that does not require complex language (Dienes & Perner, 1999).

Theory of mind and discourse-based interventions: Can language structure-training really improve theory of mind understanding?

Manuel Sprung[1], Heidemarie Lohmann[2], Petra Zauner[3], Nina Bauer[3], Hannah De Mulder[4]
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In the first of two experimental intervention studies 85 German speaking three-year-old children received training with different types of verbs that take sentential complements (mental-cognitive-, desire- or emotion verbs) or general language structure training (involving WH-questions). Children were pre- and post tested for their understanding of sentential complement syntax (memory for complements) and for their understanding of mental states (Theory-of-Mind). The results reveal significant pre- to post-test improvement for sentential complements and theory of mind tests, but no interaction between pre- to post-test improvement and type of training. This lack of an interaction leaves open whether the general language structure training (WH-questions) was equally effective as the sentential complement training or whether none of the training was effective. In a second experimental intervention study, 62 three- and four-year-olds were randomly assigned to three training groups. One group received sentential complements training with mental- and communication verbs, a second group received a WH-questions training and the third group received training with yes/no-questions (which required syntactic competence only at a very minimal degree). Children were again pre- and post-tested on sentential complements and theory of mind tasks and the results show a significant pre- to post-test improvement for the sentential complement test, but none for theory of mind tasks and no interaction between pre-posttest improvement and type of training. The results suggest that interventions which do not involve discourse about varying perspectives cannot improve children's theory of mind understanding, regardless of the language structure involved in the training (i.e., sentential complements).

Keywords: Theory-of-mind, sentential complements, discourse-based interventions.

Mother and child talk: The relative contributions of syntax, semantics and mental state terms to children's theory of mind

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In the longitudinal study by Slade & Ruffman (2005) it was argued that there was no evidence for syntax playing a unique role in the contribution of language to theory of mind. No one measure of syntax or semantics was more likely than any other to predict later false belief. Nor was false belief related more to one aspect of later language (syntax versus semantics) than another. That study tested children's receptive comprehension of aspects of syntax and semantics using a number of "standardized" tests with a limited range of items. This paper will present data taken from another longitudinal study that investigated children's (and mothers') productive language. This study tested whether children's theory of mind is facilitated by: a) mental state, b) syntactic, or c) semantic enrichment by investigating the relation between these aspects of mother and child productive language and preschool children's theory of mind in a longitudinal study involving three time points over one year. Mothers were asked to talk with their preschool child about some pictures. Mother and child utterances were then analyzed to produce four measures of productive language: mental state talk, syntactic complexity, semantic richness and mean length of utterance. Preliminary analyses showed mothers' use of mental state talk was significantly correlated with later theory-of-mind understanding across two of the three sets of timepoints, controlling for earlier age, theory of mind, mothers' education, other measures of mothers' productive language (i.e., syntactic complexity, semantic richness and mean length of utterance) and also earlier child mental state talk. Corresponding analyses failed to show any significant correlation between mothers' syntactic complexity and general semantic richness and later theory of mind, and only one correlation for mother's mean length of utterance. Conversely, no one aspect of children's language uniquely correlated with later theory of mind. In sum, for mothers, the strongest effect was for mental state language (talk about mental states facilitates children's understanding of mental states). In contrast, children's earlier language was clearly important in that it correlated with their later theory of mind, but no one language measure assumed greater importance (i.e., general child language correlated with later theory of mind rather than syntax, semantics or child mental state language per se).

This paper will review the arguments, made by Slade & Ruffman (2005), against claims for a unique role for syntax, link these arguments with the new data outlined above and end by making some speculative suggestions for the role of electrophysiological investigations into these questions.

Symposium Session 9 - Friday 1 August 09.00 - 11.00
Symposium Number – S9-1

Chair: Michèle Pettinato, *City University London*
Discussant: Michèle Pettinato, *City University London*

Phonology in Down syndrome: From perception, articulation and cognition to reading

Description:
It has long been known that phonological development is particularly impaired in children with Down syndrome (DS). In spite of this, the nature of the deficit is still little understood, and the relative contributions of lower-level difficulties such as oral motor skills and hearing as opposed to cognitive and linguistic factors are as yet unclear. This may in part be due to divisions in the literature, where studies tend to be limited to one aspect of phonological functioning: studies of productive abilities rarely also address phonological perception; conversely, studies of phonological awareness seldom provide information on productive abilities. However, relations between different areas of phonology can give indications of the nature of the breakdown and are far from trivial for the application and design of intervention methods.

This symposium therefore brings together researchers working on a range of topics in order to draw up a more comprehensive profile of phonological functioning in this population. Its aim is to establish a dialogue between different strands of research in order to find commonalities and formulate questions for future investigations. It is also hoped that this will lead to new collaborations bridging traditionally separate areas of investigation.

Phonological perception is investigated in the first presentation. Using Event-related potentials, the study compares sensitivity to speech and non-speech sounds in children with DS and typically developing matches; and it is intended to elucidate the relation between auditory processing skills and speech perception in this population. Different aspects of speech production are examined in the following two contributions. The second presentation consists of an articulatory study of consonant productions in adolescents with DS using Electropalatography. The results suggest a more persistent pattern of non-developmental errors than previously thought, and the authors propose that more objective methods than perceptual studies are needed for comprehensive evaluations of phonological development. Therapeutic applications of Electropalatography will also be discussed. The third contribution presents an acoustic study of the phonetic correlates of word stress in typically developing children and adolescents with DS. Results indicate that whilst participants with DS make appropriate use of phonetic cues, stress patterns are nevertheless not clearly differentiated. Both presentations will contribute to the discussion on cognitive and motor aspects of speech problems in this population. The role of phonological abilities for the development of reading in children with DS will be explored in two presentations of longitudinal studies. The fourth contribution examines the variation in early communicative, cognitive and speech perception abilities in young children with DS (ages 3½-5) and relates this to their early progress in learning to read. The last presentation compares phonological awareness and reading abilities in two populations, children with DS and children with SLI. Oral language difficulties have a more detrimental effect on the reading abilities of children with SLI than on those of children with DS. A longitudinal study of both populations is therefore intended to yield new insights on the functioning of phonological and reading processes.

Speech disorders in Down syndrome: Evidence from electropalatography

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Queen Margaret University

Speech development in children with Down's syndrome (DS) is typically more impaired than would be expected on the basis of their levels of cognitive impairment. Articulation errors are common, following a delayed or deviant pattern of development (Roberts et al. 2005). However, most studies of speech in DS have used subjective, auditory analyses with no instrumental evidence to quantify the exact nature of the errors. A more objective method is Electropalatography (EPG), a technique for recording and displaying the timing and location of tongue-palate contact during speech.

Data will be presented from 15 young people with DS aged 9-18 years (mean 14.3). Simultaneous acoustic and EPG recordings were made of all the children during completion of the DEAP assessment (the Diagnostic Evaluation of Articulation and Phonology, Dodd, Hua, Crosbie, & Holm, 2002) and during ten repetitions of a set of eight words containing lingua-palatal consonants.
All of the participants presented with both developmental and non-developmental errors. In many cases the errors which were transcribed as developmental were shown by the EPG recordings to be atypical. For example, in fronting of /k/ to [t] (/kat/ produced as [tat]) the realisation of [t] was a double articulation (simultaneous alveolar and velar closure) and quantifiably different from the realisations of target /t/.

In conclusion, Electropalatography offers new insights into the speech disorder in DS, showing that in some cases errors which were originally thought to be developmental are in fact disordered.

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Auditory ERPs to tones and vowels in children with Down syndrome

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Although it is thought that deficits in speech sound processing contribute considerably to language difficulties experienced by children with Down Syndrome (DS), little is known about it. In this study, we used electrophysiological markers to evaluate this. Event-related potentials (ERPs) in response to a simple tone, a complex tone and the vowel /a/ were compared in children with DS and chronological age-matched controls. An increase in tone complexity elicited very similar changes in the auditory ERPs in both groups. In contrast, marked differences between groups were observed in response to the vowel. Whereas typically developing children showed a broad negativity over frontal, central and parietal electrodes in the latency range of the N1b and P2, only a shadow of this negativity was apparent in children with DS. It is concluded that children with DS show a more pronounced deficit in processing speech sounds compared to processing simple and complex non-speech sounds. This finding will be discussed in terms of deficits in underlying cortical pathways important for speech sound processing.

Phonological awareness and reading development in children with Down syndrome and children with Specific Language Impairment

Glynis Laws
University of Bristol

In typical development there is a clear relationship between phonological development and literacy acquisition. In particular, performance on phonological awareness (PA) tasks that tap children's ability to perceive and manipulate speech sounds is an established correlate of reading ability. In Down syndrome, research reports show wide variation in PA skills and suggest that there may be qualitative differences in their development when compared to typical development. Notably, children with Down syndrome find tasks dependent on an understanding of rhyme more challenging than those that require the identification of onset phonemes. Variation in PA performance is not always related to reading levels in this group and, rather than being a precursor to reading, as in typical development, PA may develop as a result of learning to read.

This paper reports some results from a longitudinal study of children with Down syndrome and children with specific language impairment (SLI) in UK mainstream primary schools. Although a diagnosis of SLI can be applied to children with a range of language difficulties, the largest group of children with SLI are those with phonological and grammatical deficits. In this respect, the language difficulties are similar to those reported for children with Down syndrome. For most children with SLI, oral language difficulties have a more negative effect on reading development than is necessarily the case for many children with Down syndrome. By studying PA and reading in both these groups, we hope to understand more about the relationship between these functions.

Early communication and literacy skills in children with Down syndrome: Investigating how children with Down syndrome learn to read

Fiona Dalton, Margaret Harris
Oxford Brookes University

Although children with Down syndrome often master a sizeable vocabulary of written words that they can read by sight, the link between phonological awareness and reading success for children with Down syndrome is still unresolved. Some researchers have maintained that children with Down syndrome are unable to make the connection between orthography and phonology (Cossu, Rossini and Marshall, 1993; Cossu, 1999), while other research has not only demonstrated a degree of phonological awareness (Cupples and Iacono, 2000), but also shown that teaching phonological skills to children with Down syndrome can help them learn to decode unfamiliar words (Gombert, 2002; Kennedy and Flynn, 2003). This project is investigating how children with Down syndrome progress beyond the use of logographic strategies. It studies the impact of any delay or difficulty in accessing the phonology of spoken language and considers how the children learn to apply knowledge of phonology to unfamiliar text. The study is adapting methods used to study pre-literacy skills in children with hearing impairment (Harris and Beech, 1998; Kyle and Harris, 2006) and is comparing the strategies used by this group of young readers. The methods of assessment used are appropriate for the cognitive delays, language and communication difficulties and other problems with short-term memory often experienced by children with Down syndrome.

The research design is longitudinal, involving a group of 32 children between the ages of 3½ - 5 yrs old whose early language development is being followed for a period of 24-30 months in order to uncover the skills that predict success in learning to read.

Phonological awareness, visual recognition, verbal comprehension and spatial memory are being assessed, as well as vocabulary growth and single-word reading skills. Currently, Oxford Communicative Development Inventory (Hamilton, Plunkett & Schafer, 2000) data have been collected during initial visits to the children; this parental report measure describes the receptive and productive vocabulary of each participant. In addition, the use of signing during the early stages of vocabulary acquisition has been noted. At 4½ - 5 years old each participant will be assessed in order to gain a measure of non-verbal IQ (Leiter-R), vocabulary (BPVS 2nd ed.) and auditory discrimination skills (using a minimal-pairs phonological discrimination task). An initial analysis of patterns and strengths emerging from this comprehensive developmental record of communication and pre-literacy skills will be presented, and the variation found across the sample in their early reading achievements will be discussed.

The role of phonetics in the prosodic difficulties of children with Down syndrome

Michèle Pettinato, Jo Verhoeven
City University

The phonological development of English-speaking children with Down syndrome (DS) has recently been described as showing evidence of prosodic stagnation (Pettinato & Verhoeven, submitted): in spite of having a vocabulary level above the age of four, when stress patterns have been acquired (Kehoe, 1998; Fikkert, 1994), children with DS did not seem to have fully acquired iambic forms and compound structures. This may in fact be due to a less mature phonetic system, as participants with DS failed to reduce unstressed vowels, a characteristic typical of young children who have not fully mastered the native stress system yet (Kehoe, StoelGammon, & Buder, 1995; Allen & Hawkins, 1980).

In order to find out whether a phonetic immaturity could underlie the prosodic difficulties of children with DS, the phonetic correlates of word stress in participants with DS were compared to those of typically developing children who had not fully acquired stress yet.

Six participants with DS (ages 11-20) and ten typically developing children (ages 2-4) were recorded producing iambic and trochaic words. The duration, intensity and F0 of tokens were measured. Perceptual analyses indicated that on iambic items, the group with DS made significantly more stress errors than the control group. Acoustic analyses suggested that the groups did not differ on their use of duration; difficulties with stress marking in participants with DS could therefore not be solely attributed to an inability to reduce vowels. Moreover, participants with DS used all three acoustic cues to mark stress. Nevertheless, when the overall use of the acoustic space was taken into account, participants with DS were less able to differentiate between the two stress patterns than the control group.

These results will be used to discuss the relation between phonetics and phonology in this population and methodological suggestions for acoustic investigations of prosodic development will be made.

Symposium Session 9 - Friday 1 August 09.00 - 11.00
Symposium Number – S9-2

Chair: Ana Pérez-Leroux, *University of Toronto*, Theres Gruter, *Université de Montréal*
Discussant: Theres Grüter, *Université de Montréal*

Detecting null arguments in child language: Comprehension approaches

Description:
The omission of obligatory arguments in children's speech crosslinguistically is one of the most salient properties of child language, and one of the most intensely studied. Developmental accounts of argument omission differ widely, some attributing children's non-target utterances to linguistic factors (e.g., parameter mis-setting, Hyams 1986), others invoking performance limitations, i.e., extra-linguistic factors (e.g., Bloom 1990). Until very recently, the relevant empirical evidence came exclusively from children's spontaneous speech. Evidence from children's interpretation of utterances lacking obligatory arguments has been all but absent. Yet it is precisely in their predictions for comprehension that linguistic and non-linguistic accounts of argument omission differ most significantly, thus evidence from this domain could be decisive. The goal of this symposium is to bring together researchers who have been developing receptive procedures for investigating the interpretation of null subjects and objects in child language crosslinguistically, and to provide a platform for discussion on the relevance of such data for theories of language development.

Paper 1 presents new data from the truth-value judgment (TVJ) task of Grüter (2006), showing that child L2 learners of French – like L1 learners – reject null objects, despite object omissions in production. Moreover, data from working memory measures reveal a negative correlation between learners' memory span (non-word repetition) and rate of object omission in production, which is taken to support Grüter's (2006) suggestion that object omission is due to non-linguistic factors, i.e., working memory.

Paper 2 presents an adaptation of Grüter's TVJ task for European Portuguese (EP). Findings show that, contrary to French-speaking children, Portuguese 3-4-year-olds accept null objects. Interestingly, acceptance extends to island contexts, where null objects are disallowed in adult EP, suggesting that object omission in child EP is due to overgeneralization. Furthermore, the difference between the French and Portuguese comprehension results indicates that object omission in child Romance is not a unitary phenomenon.

Paper 3 concentrates on null objects in optionally transitive verbs with a prototypical interpretation. The basis of the study is that, under the scope of negation, implicit objects function as narrow scope indefinites, in sharp contrast with anaphoric or referential elements, which raise above the scope of negation. The results indicate that 3-5-year-old English-speaking children can give an anaphoric interpretation to these implicit objects, suggesting the availability of referential null objects in children.

Paper 4 reports results from a novel task designed to investigate children's interpretation of null subject (NS) sentences, which in English are grammatical only as imperatives. Under performance accounts of the NS phenomenon, English-speaking children should interpret such sentences as imperatives only, whereas under representational accounts, declarative interpretations should be possible. Findings show the latter for children aged <3;4, whereas older children correctly assigned only imperative interpretations.

Paper 5 investigates the interpretation of null and overt subjects in Greek through on-line self-paced listening and sentence-picture matching. Results show that Greek children perform like adults for overt subjects, but differ from adults in their preferred interpretation of null subjects, raising the question whether children employ different processing strategies in the interpretation of null arguments.

Working memory and the underlying representation of missing objects in the development of French

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The nature of object (clitic) omission observed in the speech of most Romance-speaking children has been a topic of intense debate. Based on omission data from language production, a number of developmental accounts have been proposed. Some have argued for initial parameter mis-setting, by which French-speaking children pass through a stage where null objects of the Chinese or Japanese type are sanctioned (Müller et al. 1996, Müller et al. 2006). Others have proposed that null objects are the result of prolonged retention of a default structure, a null cognate object (N), due to the complexities of the French input (Pérez-Leroux et al. 2006). Both of these accounts seek an explanation at the level of grammatical representation. By contrast, others have suggested that the problem lies in a non-syntactic domain, such as morphological paradigms (Fujino and Sano 2002) or working memory (Grüter 2006).

These two types of developmental accounts make opposite predictions with regard to learners' performance on a receptive task: 'representational' accounts predict the acceptance of null objects, whereas 'non-syntactic' accounts predict rejection. These predictions remained untested until Grüter (2006) presented a truth-value judgment (TVJ) task using optionally transitive verbs in French (e.g., *plonger (qc)*, 'to dive' or 'to dip sth'), with the crucial condition consisting of an utterance without an (overt) object coupled with a picture illustrating the verb's transitive use. Her results showed clear rejection (85-90%) of such items by French-speaking children aged 3 and 4, contrary to the predictions of 'representational' accounts of object omission. Grüter (2006) suggested instead that omissions in production may be due to limited working memory resources.

This paper follows up on this suggestion, and presents new evidence from French L2 in its support. Grüter's TVJ task, a clitic elicitation task, and two subtests from a working memory assessment were administered to 85 anglophone children schooled in French immersion (grade 1). Results show a high rate of object omission (41.6%), as well as a high rate of rejection of null objects (96%) overall. Among those learners who produced at least two preverbal clitics and scored 6+/8 clitic items correct in the TVJ task (N=24), object omission rates in production persist at an average rate (17.6%) comparable to those observed in L1 French at around age 3-4. These L2 learners thus resemble L1 learners at an earlier point in development with regard to both object omission in production, and the rejection of null objects in comprehension, suggesting that the same developmental account may apply to both. Under Grüter's (2006) proposal that omissions are related to limited working memory resources, we would therefore expect to find a negative correlation between omissions and memory span. A significant negative correlation ($r = -.547$) was indeed found between object omission and one measure of working memory (non-word repetition) for this group, while the other measure (backward digit span) did not yield significant results. We will argue that these results constitute further evidence in support of a non-representational account of object omission in the development of French.

Pronoun ambiguity resolution: Evidence from L1 Greek children

Ianthi Maria Tsimpli[1], Despina Papadopoulou[1], Evangelia Plemmenou[2], Theodore Marinis[3]
[1]Aristotle University of Thessaloniki, [2]University of Athens, [3]University of Reading

In this paper we report on two on-line sentence-picture matching experiments in which we investigated pronoun ambiguity resolution with Greek adults and children.
Greek is a null subject language and, therefore, both the null pronoun in (1) and the overt pronoun in (2) can in principle refer to either the subject or the object of the main clause:

(1) I ghramateas voithuse ti nosokoma otan *pro* eghrafe ena ghrama.
(2) I ghramateas voithuse ti nosokoma otan *afti* eghrafe ena ghrama.
"The secretary- F helped the nurse-F when *pro*/she wrote a letter."

Processing accounts of pronoun resolution predict that the null and the overt pronoun in sentences such as (1) and (2) will be preferably interpreted as referring to the subject of the matrix clause. According to Centering theory (Brennan et al., 1987; Grosz et al. 1995), this prediction is based on the preference of pronouns to have antecedents in subject positions. On the other hand, the Parallel Preference account (Chambers & Smyth, 1998) makes the same prediction, because pronouns are assumed to prefer antecedents in a parallel position.

We tested the way Greek adults and children interpret the subject pronouns in (1) and (2) by using a self-paced listening sentence-picture matching experiment (Marinis, in press). The participants were first presented with a picture that depicted either the subject, the object of the matrix clause or another person performing the action described by the subordinate clause. Then they listened to the sentences segment-by-segment by pressing a button and at the end of each sentence they had to decide whether the sentence they heard matched the picture. We measured reaction times (RTs) of pressing the button for each segment, and also for the decision at the end of the sentence. Thirty monolingual adults and thirty monolingual 10-year-old children participated in the study, all native speakers of Greek.

The results showed that:
(a) For overt pronouns, both adults and children preferred to interpret them as referring to the object of the main clause. This preference was evident in the matching data as well as in the RTs of the subordinate verb.
(b) For null pronouns, there was a difference between adults and children. Adults showed a preference for the subject reference, whereas children interpreted null pronouns as referring to either the subject or the object.

These findings argue against the Centering theory and the Parallel Preference account, since a subject-reference preference was not found across the board. Moreover, our results indicate differences between the adults and the children in the way pronoun ambiguity is resolved at least in the null pronoun condition. Our results will be discussed in relation to cross-linguistic (Tsimpli et al. 2004) and developmental effects on pronoun resolution.

An experimental study of children's comprehension of null subject sentences

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Until English-speaking children are approximately 3 ½ -years-old, close to 50% of their spontaneous productions lack a sentential subject (1). This 'null subject' (NS) phenomenon is of particular interest in languages like English, in which these sentences are only grammatical as imperatives, contrasting with languages such as Italian that freely allow subject omission in declarative sentences (2). Two classes of explanations exist for the NS phenomenon. Grammatical accounts consider children's erroneous productions to be a manifestation of a difference between the child and adult grammar. Conversely, performance accounts assert that subject omission does not reflect a different grammar, but is a performance effect due to either purported limitations on memory and processing capacity, or a preference for particular metrical structures that null subject sentences satisfy.

Spontaneous speech data has not provided concrete evidence in favor of either class of explanation. The theories, however, make very different predictions about how children will comprehend NS sentences. Grammatical accounts predict English-speaking children will understand and accept NS sentences as grammatical declarative sentences (as in Italian), while performance accounts hold that child's and adult's grammar do not differ. Thus, children should accept only an imperative reading for NS sentences, not a declarative reading. Before now, however, no experimental or comprehension-based studies of the NS stage have been conducted.

In the first experimental study to examine comprehension of NS sentences, 30 children (13 M, 17 F) in 6-month increments between 2 ½ and 4-years were given a Truth-Value-Judgment (TVJ) task. A standardized test was first administered to identify those children in the Null Subject stage. In the TVJ task, subjects were shown a picture of a pair of younger children who must wait for an observing puppet to give them a command to do something (e.g. eat a cookie) and a picture of an older pair of children already doing the activity. The puppet then commented on only one of the two pictures, using either a *declarative* (3), *imperative* (4), or *null subject* (5) sentence (24 items total), and the child was asked to judge whether the comment matched the picture.

Importantly, having an adult grammar should lead a child to correctly interpret the null subject items as commands, which can only describe the picture of the younger children. A child interpreting null subject sentences as declaratives would thus answer incorrectly on this condition, as a declarative sentence appropriately describe only the story about the older children.

Children easily comprehended the *declarative* and *imperative* items, demonstrating understanding of the scenarios and the appropriate distribution of the declarative and imperative mood. Until the age of 3 ½ years, however, children were consistently below chance on the *null subject* condition (Table 1). These children appear to comprehend *null subject* items as declaratives. Moreover, children provided follow-up explanations consistent with a declarative interpretation, suggesting that the null subject stage is a delay in comprehension as well as production. Overall, we take these results to support a grammatical, rather than performance, explanation for the null subject phenomenon.

(1) Eat an apple.
(2) Mangia una mela.
Eats an apple
(3) They always play with blocks.
(4) Please eat a cookie.
(5) Draw a picture.

Table 1: Children's performance by condition

	N	Declarative	Imperative	**Null Subject**
2.5-2.9 years	10	95%	94%	**14%**
3.0-3.4 years	10	99%	91%	**40%**
3.5-3.9 years	10	95%	96%	**83%**

Acquisition of clitics in European Portuguese: Data from comprehension

Maria Lobo, João Costa
Universidade Nova de Lisboa

Clitic omission is a much debated topic in the acquisition of several languages. There are several debates regarding i) whether omission is a universal phenomenon or not, ii) the nature of omission, iii) the age at which clitics cease being omitted. For European Portuguese, Costa and Lobo (2005, 2006) and Carmona and Silva (2006) have shown that children omit clitics, although there is a strong correlation with the adult null object construction. This correlation is reinforced by the fact that the rate of omission is higher for clitics that can alternate with null objects.

An important issue in the discussion of clitic omission is to know what structure is assigned to a sentence without complement: is there a null form? Is the verb's transitivity preserved? For this matter to be settled, it is important to assess children's comprehension of null object constructions. Grueter (2006) has shown that French speaking children, although producing null objects, do not assign transitive interpretations when hearing null object sentences. Instead, they interpret the verbs as intransitive. In this paper, we adapt this test to European Portuguese in order to determine whether European Portuguese speaking children are able to comprehend null objects. 20 children aged between 3 and 5 (mean age: 4;4) were tested for the comprehension of null objects. The following conditions were used: null objects (in order to detect whether children master this construction); ungrammatical null object in islands (in order to detect whether contexts in which null objects are ruled out in the adult grammar are excluded by children); sentences with clitics, sentences with intransitive structures and with superfluous arguments (in order to detect whether children master (in) transitivity. Our results show that, unlike French speaking children, European Portuguese speaking children correctly accept null object sentences. Interestingly, we found that children, unlike adults, accept null objects in island contexts, which provides indirect support to the idea that clitic omission in European Portuguese is an overgeneralization of the null object construction. The mismatch between the results for French and for European Portuguese is interesting since it confirms the distinct nature of clitic omission in the latter, and it shows the non-universality and non-uniformity of this phenomenon. Also, it reinforces the idea advocated by some authors that the interpretive nature of the omitted element is crucial for an understanding of these facts.

Children's interpretation of null objects under the scope of negation

Yves Roberge[1], Ana -T. Pérez-Leroux, Mihaela Pirvulescu
University of Toronto

To date research on the acquisition of transitive structures has viewed the intransitive/transitive distinction as an inherent specification of individual verbs. As such, the task of the child is to learn the category of a verb (Tomasello 2000, Ingham 1993/1994). This standard view of transitivity as a categorical feature of the lexical entry faces the problems of transitivity transgressions. Unergatives appear with hyponimic objects, modified cognate objects or with measure objects (1). Most transitive verbs alternate, but the implicit object is prototypical or generic, and does not bear a referential index (2). Last, even obligatorily transitive verbs occasionally appear with implicit objects, given an appropriate context (3).

(1) a. We danced a tango.
b. She lived a good life.
c. I ran a mile.
(2) She ate early last night. (= 'a meal', ≠ 'fish')
(3) There are those who annihilate__ with violence - who devour __. (BNC: FAT 2709)

Transitivity seems instead a gradable property. Therefore, Cummins & Roberge (2005) propose that transitivity is a syntactic construct, so that, underlyingly, all VPs project an object position. Different verbs vary as to the likelihood that the object will remain implicit or not. Implicit objects in English are null cognate bare nouns with nonreferential, prototypical interpretation, in contrast with other languages such as Portuguese, where null objects can be anaphoric.

We formulate a new developmental question. How does the child acquire the semantic restrictions that the adult associates with implicit objects? The learning task is challenging, given that many implicit objects appear to be referential, but these anaphoric readings can be defeated:

(4) Peter bought a magazine. While waiting for his mother, he sat down to read.
….However, he did not read the magazine.

We investigated whether children allowed anaphoric reference under negation contexts, where the relative semantic scope of negation and the object allows a truth-functional contrast between true anaphoric readings and generic readings. The prompt contained either a cleft or an implicit object. Children are introduced to a context such as below followed by a picture of sandwich on the floor, next to Peter, who is eating an apple. A puppet describes the scene with either an implicit object (5a), where negation takes scope, or a cleft (5b), where the object is above the scope of negation. The child then judges the truth of these negative sentences.

(5) a. Look, the sandwich fell to the floor. So Peter does not want to eat. (Implicit object, = 'not eat anything')
b. Oh, Look, Peter does not want to eat what his mom made. (cleft, ='not eat the sandwich')

Preliminary results (N=14) show that children (3;9-5;6) have no difficulties with clefts. Unlike adults (N=12), they accept implicit objects as describing a situation where the sandwich was not involved in the event, but something else was. Children have yet to learn to restrict null objects to their target generic, non-referential interpretation. This data supports the hypothesis that children go through a stage where they interpret implicit objects anaphorically, capable of bearing a referential index (Pérez-Leroux, Pirvulescu & Roberge, to appear).

Symposium Session 9 - Friday 1 August 09.00 - 11.00
Symposium Number – S9-3

Chair: Michèle Guidetti, *Université Toulouse II*
Discussant: Elena Nicoladis, *University of Alberta*

The origins and functions of infants' gestures: A harbinger of linguistic development

Description:
Words are usually arbitrarily linked to their meaning. How do infants learn to link words to meaning? One possibility that researchers have considered is that the origin of learning symbol-referent connections is initially in something less arbitrary than words: gestures (e.g., Armstrong, Stokoe, & Wilcox, 1995). There are at least two ways in which gestures might provide a non-arbitrary link to the referent. Iconic gestures are those which resemble the referent (such as using two fingers to represent the legs in walking) and deictic gestures are those which draw the listener's attention to something in the physical world (such as pointing). By narrowing the possible referents of a speaker's communication, gestures may be at the origins of language both phylogenetically (e.g., Tomasello, 1999) and ontogenetically (e.g., Volterra & Erting, 1994).

Children usually produce manual gestures communicatively before they start to use conventional words. Young children can use gestures both imperatively (such as pointing at something they want) and declaratively (such as pointing at something they find interesting). Some researchers have argued that early gestures serve the same symbolic and communicative functions as early words (e.g., Goodwyn, Acredolo, & Brown, 2000). What are the origins of children's gestures? Do gestures serve the same functions as early words?

This symposium will bring together evidence on how gestures are related to language, communication in development with a focal interest on comparisons (ape vs. human gestures, gestures in different linguistic environments, caregiver vs. children gestures etc.).

To address the possible phylogenetic origin of gestures, one paper compares the gestures of human infants with the gestures of other primates. Other primates use gestures imperatively but rarely use gestures declaratively. This paper discusses the possibility that declarative gestures were the origin of human language.

To address the possible ontogenetic origin of gestures, several papers focus on the origins of gesture developmentally. These papers rely on longitudinal data collected in a variety of cultural and linguistic contexts. The authors consider several possible origins of gestures, including infants' own actions in the world and imitation of others. The data include observations of children's and parents' spontaneous communication and experiments designed to elicit imperative and declarative gestures.

One theme underlying the ontogenetic origin of gestures is how infants' gestures function in communication. Do infants' gestures have the same discourse function as early language (e.g., imperatives and declaratives)? Can infants' gestures relate symbolically to the referent? If infants used gestures symbolically, then as the use of words increased with age, the use of gestures might drop off. One paper in this symposium in particular argues that children's earliest two concept combinations are composed of gesture + word rather than word + word combinations. This phenomenon can be seen cross-linguistically.

Together, the papers in this symposium support the conclusion that the origin of gestures in infants is complex and depends on children's genetic, motoric, cognitive and social development. The discussion of the results focuses on whether gestures could be part of the phylogenetic and ontogenetic origins of human language.

From action to pointing at 9-15 months of age: A comparison between two communicative contexts

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Researchers agree to distinguish two types of pointing at the end of the first year of age: the imperative one (to obtain a desired object or action from the partner) and the declarative one (to share with the partner attention and interest about an object/event in the world). Otherwise, theorists do not agree on the origin of pointing, whether it emerges as a result of the mother's response to the infant's failed attempts to reach objects, as Vygotsky argued (1926), or it is linked to the finger exploration of objects as in Werner and Kaplan suggestion (1963). Moreover, controversial results were found with respect to the developmental sequence of pointing at the outset, whether the imperative emerges before or after the declarative (Camaioni et al., 2004; Carpenter et al., 1998). These questions are addressed by the present study.

18 infants were followed longitudinally from 9 months to 15 months of age. Children were tested monthly on a task designed to elicit pointing in imperative and declarative contexts (Camaioni et al., 2004). Experimental sessions took place in a laboratory room equipped with two remotely controlled cameras and were videotaped. All actions, gestures, facial expressions, vocalizations produced by the children during the task trials were transcribed and coded. Group and individual measures were used in the analyses.

Preliminary analyses concerning actions and gestures at 9 and 12 months showed that infants produced significantly more actions (banging hands, swinging arms, etc.) and gestures (point, index-finger extension, reaching) in the imperative than in the declarative context and their production was more at 12 than at 9 months. With regard to the types of behaviors at either age, "banging the hand" was the predominant action at 9 months; at 12 months it predominated only in the declarative context. In parallel, "index-finger extension" was the predominant gesture at 9 months, whereas at 12 months it predominated together with "pointing" in the declarative context and together with "reaching" in the imperative context. Six infants started to point at the same age in imperative and declarative contexts; four infants first pointed in imperative and then in declarative; three infants first pointed in declarative and then in imperative.

9-12 month-old infants who were presented with contexts that are suited to elicit pointing used a variety of actions and gestures, more in imperative than in declarative context. Whereas the types of actions and gestures appeared to be quite similar in the two contexts at 9 months, they differed at 12 months. In particular, pointing becomes associated with reaching in imperative context and with index-finger extension in declarative context. Moreover, individual differences were found in the ontogenetic sequence of pointing. Implications for a context-driven development of pointing are discussed.

Assisted imitation: Caregiver gestures cultivate a shared understanding of action that underlies early communicative development and later language learning

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Rizzolatti & Arbib (1998) proposed that a shared understanding of action grounds the emergence of gesture and leads eventually to language, both phylogenetically and ontogentically. The core of this understanding is knowing that the actions of others are analogous to that of the self. Many theoretical positions from a variety of disciplines attribute different sources to this understanding in young infants, including innate abilities (Meltzoff and Moore, 1995), identification (Hobson & Hobson, 2007), caregivers imitate infants (Barresi & Moore, 1996), cognitive precursors (Piaget, 1962; Uzgiris, 1991; Heyes, 2005), socio-pragmatic knowledge (Tomasello et al, 1993), and simulation modelling (Hurley, 2005). Given infants know that the self and other are alike, it follows that infants learn new behaviours not in the repertoire by spontaneously imitating the actions they have observed others performing.

However, Byrne (2003) distinguished two uses of *imitation*:

(1) *the transfer of skill problem* (how someone acquires *novel*, *complex* *behavior by observing*);
(2) *the correspondence problem* (how someone matches *observed* *actions* with *self-executed actions).*

As noted, many scholars solve the *correspondence problem* by arguing that infants know that others are *"like me"* and, thus, imitate "naturally." Is this assumption warranted? This research first documents whether or not caregivers and/or infants spontaneously imitate one another. If spontaneous imitation is not a robust phenomenon, then a different kind of imitation might inform learning new actions. Consequently, this research examines the *transfer of skill problem.* While engaged in *assisted imitation,* we propose that caregiver gestures direct and educate infants' attention by linking the actions of self and other through the dynamic coupling of affordances (opportunities for action) and the body's work to reach a shared understanding.

Method: These results come from a longitudinal sample consisting of five English-speaking, Euro-American middle-class and six Spanish-speaking, Latino working-class families with an infant of 6 months who lived in an urban center in the Western US. They participated from the initial pre-linguistic period until the infant produced more than one-word at a time around 21-26 months. We collected twenty-minute videos each month of naturalistic interaction at home plus supporting documentation. We assessed the incidence of infant and caregiver spontaneous and assisted imitation. We examined caregiver attention-directing gestures including embodying, showing, demonstrating, and pointing that occurred alone or accompanied speech.

Results: Highly significant results indicated that spontaneous imitation by infant or caregiver occurred very rarely. Multivariate frequency analyses examined culture, lexical level, caregiver gesture, and reaching consensus or shared understanding.

Discussion: *Assisted imitation* accounted for 95% of the observed imitative behaviour, rather than spontaneous imitation. The caregiver gestures that may promote a *transfer of skill* bracket ongoing actions, so that infants learn new bodily abilities and how to detect new opportunities for action. These gestures may literally put infants in touch with both sides of the *correspondence problem* – the relation between first and third person perceiving and acting. That is, learning that the self is "like others" who are more skilled, leads to a shared understanding of action that may underlie early communicative development, eventually leading to language.

Learning to talk in a gesture-rich world: Early communication in Italian vs. American children

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Despite the mounting empirical evidence for cultural differences in the gestures that adult speakers produce when they talk, we know relatively little about how children in different cultures use gesture during the earliest stages of language-learning. Italian children are immersed in a gesture-rich culture. Given the large gesture repertoire of Italian adults, young Italian children might be expected to develop a larger inventory of gestures than American children. If this is the case, then do these gestures impact the course of language learning? The present study was designed to address this question by examining gesture and speech production in Italian and American children between the onset of first words and the onset of two-word combinations.

Six typically-developing children (3 Italian, 3 American; 1 girl and 2 boys in each group) were videotaped monthly at home, beginning with the onset of single-word utterances (between 10 and 11 months) and ending at the onset of two-word combinations (between 17 and 21 months). Sessions, which included the parent, involved free play with toys and a meal or snacktime. All communicative gestures, vocalizations, and meaningful words were transcribed from videotapes and coded according to whether or not they were produced in combination.

There were differences in the size of the gesture repertoires produced by the Italian vs. the American children. The Italian children conveyed a broad range of meanings via representational gestures, and they produced representational gestures more frequently than did the American children. The American children, in contrast, relied primarily on deictic gestures, which were also found in the Italian children's gesture repertoires. In addition, among Italian children, gestures were also much more likely to express meanings that did not overlap with words in their spoken vocabularies (and vice-versa). However, the difference in composition of the gesture repertoires did *not* influence when Italian and American children first used gesture along with speech to convey multiple pieces of information in gesture + word combinations or the emergence of two-word utterances. Indeed, in both cultures, we found that gesture + word combinations reliably predicted the onset of two-word combinations.

Our findings suggest that there is cultural variation in the gesture repertoires found in even the youngest speakers, variation that may reflect differences in the nature of the gesture models to which the children are exposed. For young Italian children exposure to a rich gestural model may attune them to the ways in which representational information can be captured by the manual modality. Italian caregivers may readily identify an action produced by the child as a representational gesture, incorporating it into the gesture repertoires they use with the child. Results are further discussed in terms of the robustness of gesture as a harbinger of linguistic development and the extent to which gesture may provide a means for children to 'practice' emerging linguistic abilities.

Do babies learn to gesture because they participate in action?

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Children often use some manual gestures, or communicative movements made with empty hands, before they speak (e.g., Iverson, Capirci, & Caselli, 1994; Acredolo & Goodwyn, 1988). Researchers have noted that babies learn some gestures from the adults around them (e.g., hi/bye, bravo; Caselli, 1990; Guidetti, 2003). Other gestures may be learned by familiar actions (e.g., babies may learn to gesture pick-me-up from reproducing the action that they make when being picked up; Tomasello, 2003). The origin of other gestures is not necessarily clear. For example, infants sometimes produce an outstretched arm to draw others' attention to objects in the environment before they start pointing (e.g., Blake, 2000; Masur, 1983)

Clark (1978) argued that all of children's gestures emerged from children's participation in action in the world. He made a detailed analysis of how the "give-me" gesture could emerge from interactions between a young infant and her mother in the context of exchanging objects. The infant started off by being fairly passive in her receiving the object. With repeated object exchange, she came to learn that she could initiate the open-handed outstretched arm to receive objects. Once children have learned that they can produce the gestures without the context of the entire interaction, they can use gestures (and words) as communicative symbols. The purpose of the present study is to test Clark's hypothesis.

This study included four infants, videotaped in free play contexts with their families every two weeks from the age of 6 months until they could use several words (i.e., between 1;0 and 1;6). We categorized the infants' gestures into (1) action-participant gestures (e.g., pick-me-up, give, open-handed reaching to show something) and (2) conventional gestures (e.g., hi/bye, pointing with an index finger). We predicted: (1) The children would produce action-participant gestures before conventional gestures. We reasoned that if Clark were correct, the children would only become communicative and use arbitrary conventional gestures after they learned action-participant gestures. (2) The rate of reaching to indicate would go down with age at around the same time as pointing to indicate increased.

The results showed that the age of onset for most conventional gestures preceded that of action-participant gestures. The rate of reaching to indicate increased with age, along with the rate of pointing (see also Blake, 2000).

These results suggest that Clark's hypothesis was incorrect. One possibility is that reaching to indicate serves a different function than pointing, supporting the presence of both forms at the same time. This suggests that one form is not a more developed form of the other. The primary source of babies' earliest gestures is probably imitation of the adults around them, rather than participation in action. If participation in action plays a role in babies' use of gestures, it is secondary to learning gestures through imitation. These results are consistent with a theory of cognitive development grounded in social interaction (e.g., Tomasello, 2003). That is, children's primary motivation in producing gestures is to participate in social interactions.

Gestures of apes and pre-linguistic human children: More similar or more different?

Simone Pika
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One of the driving forces of human research is the question how spoken language, which is thought to be unique to humans, originated and evolved. Researchers quite regularly addressed this question by comparing human communicative signals to the systems of communication evolved in other animals, especially in one of our closest living relative, the non-human primates (hereafter primates). The majority of research focused on vocal communication, which might be due to the analogy to human language. Although it has been shown that monkeys are able to use vocalizations referentially and combinatorial, the majority of primate vocalisations can be described as being hardwired and tightly tied to emotional states. Researchers therefore quite naturally looked at another means of communication embodied in speech, gestures. It has been shown that gestures play an important role in the communication of primates and resemble those of pre-linguistic children and just-linguistic human infants in some important ways: they are multifaceted, used as intentional acts, represent a relatively stable part of an individual's communicative repertoire, and are clearly learned. However, primate gestures also differ from the gestures of human infants in some important ways as well: they are mainly dyadic and are used as effective procedures to request actions from others (imperatives). Human children also start to communicate in dyadic interactions by using imperative gestures. However, from very early on they also use declarative gestures, e.g. pointing, to direct the attention of recipients to particular aspects of the environment. These differences in direction and function might provide crucial clues for answering the question of how human language –at least in its cognitive and social-cognitive aspects- evolved from the gestural communication of our ape-like ancestors.

The proposed paper will therefore provide an overview on the gestural signalling of primates, with a special focus on the referential use of gestures. The discussion focuses on similarities and differences to i) other referential gestures in apes, ii) gestures of pre-linguistic and just linguistic human children, and iii) homesigns to elaborate on the question if the gestural modality of our nearest primate relatives might have been the modality within which symbolic communication first evolved.

Language, pointing, and actions during mother and child daily routines

María José Rodrigo, Mercedes Muñetón
University of La Laguna

This presentation is aimed at examining how mother and child language, their production of pointing, and their object-directed actions were related at the micro-level of gestural referential acts. Studies on language acquisition have documented language-action relations during the linguistic referential act. Children´s first words and sentences involve a restricted set of meanings having to do with agency, action, object location and possession, all around the manipulative scene (e.g., Slobin, 1985). A relation between maternal language and child pointing has also been found in many studies (e.g., Butterworth & Morisette, 1996; Goldfield, 1990; Pettito, 1993), and between maternal pointing and child pointing (Rodrigo et al., 2006). Children´s use of pointing and speech has been found to be related to maternal pointing (Iverson et al., 1999; Rodrigo et al., 2006). We want to go one step further, by exploring the role played by object-directed actions (either alone or accompanied by language) as a triggering factor of pointing.

Mother and child language, pointing gestures, and object-directed actions were examined over the second and the third years. The idea was to analyze the whole act of gestural reference during mother and child performing of play, bath and dinner routines. Eight mothers and their 1- and 2-year-old babies were studied during one year of observations every three months. Mother and child episodes of pointing were selected to examine whether they are produced alone or accompanied by a verbal utterance/vocalization and the context of gesture production. For each instance we coded: (1) the referent target (own body, object, action, location) and whether it is visible, occluded or absent; (2) the immediate preceding context to the pointing gesture: either self-initiated or induced by: (a) A mother or child verbal utterance or a vocalization; (b) manipulative actions with objects, performed by the mother, the child, or both; (c) mixed verbal utterance/vocalization plus actions with objects; (d) a mother or child pointing. We also coded the occurrences of object-directed actions during non-gestural instances to have a base-line measure of action production. Finally, the total number of words per minute for the mother and child at each age-point observed was obtained to use as a covariate in mother-child comparisons.

Preliminary results indicated that pointing gestures were produced very frequently by mothers and children and followed a significant positive trend with age. Maternal and child pointing were accompanied with verbal utterances/vocalizations across ages whereas infant "pointing only" decreased with age. The referent target for the mother and child is mainly external and visible/occluded and becomes more absent with age. As for the context, we expected that spontaneous pointing might be more frequent for mothers than for babies. Verbally induced pointing and "action only" induced pointing would be more typical of infant pointing whereas mixed verbal/action forms would be typical of both. In this way, infants and toddlers would be able to use others´ outward behaviors to objects as cues to determine where others are attending to and eventually to redirect their attention, even without an understanding of the other´s subjective experience.

Symposium Session 9 - Friday 1 August 09.00 - 11.00
Symposium Number – S9-4

Chair: Valerie Shafer, *Graduate Center, City University of New York*
Discussant: Richard Schwartz, *Graduate Center, City University of New York*

Brain indices of speech discrimination in monolinguals and bilinguals: Developmental perspectives

Description:
There are approximately 47 million people in the US who speak a language other than English and an even greater number internationally. The challenges of diagnosing speech language disorders in the bilingual child are compounded by the lack of knowledge regarding the course of their natural language acquisition.
There is preliminary evidence that suggests a link between the development of speech perception skills and later language abilities (e.g., Benasich & Tallal, 2002). However, to determine the nature of this link directly, the development of speech perception needs to be

examined using speech stimuli. In particular, the different input directed to children in a bilingual environment should lead to differences in speech perception development from children receiving monolingual input.

The principal aim of this project is to determine the relationship between the brain's ability to discriminate vowel sounds and language development. We are examining this relationship in infants from monolingual English and bilingual Spanish-English families. This symposium will present studies that track development of the perception of the vowel contrast /ɪ/ in "bit" and /ɛ/ in "bet" (native in English but not in Spanish) and relate it to developing language abilities.

Neurophysiological indices of speech discrimination are the primary measure.. The amplitude and latency of the ERP discriminative measure, mismatch negativity (MMN) are correlated with the acoustic or phonemic status of a pair of stimuli (e.g. Naatanen, 1990; Winkler, et al., 1999). For example, the onset latency of MMN is earlier for listeners who have had experience with a particular pair of sounds (Shafer, et al., 2004). MMN is also sensitive to language impairment (e.g., Shafer, et al., 2005). Children with SLI showed deviant or absent MMNs to a /ɪ/-/ɛ/ contrast, unlike typically developing children who generally show robust MMNs. In infants,a positive mismatch response (the positive MMR) appears to reflect difficulty of discrimination and language experience, similar to the adult MMN (see Dehaene-Lambertz and Gigla, 2004).

ERPs were recorded to the vowels /ɪ/ and /ɛ/ in oddball paradigms designed to elicit the MMN or MMR in infants and children (0;3-10;0). These children came from families providing only English or both English and Spanish input. The ERP measures are compared to behavioral measures of perception, standardized test scores (e.g., PLS-4 and Peabody Picture Vocabulary Test in English, and PLS-3 and TVIP in Spanish) and language background characteristics. Preliminary results reveal discrimination of these sounds for both the bilingual and monolingual groups, but also suggest differences in how neural resources are allocated in perceiving speech in bilingual versus monolingual participants. These data will also be related to standard test scores and more fine-grained measures of English input. These data will help us understand how language input in infants and children from bilingual families influences development in English, and therefore strengthen our basis for diagnosing disorders.

Brain indices of speech discrimination in infants and toddlers

Yan Yu, Karen Garrido-Nag
City University of New York

The purpose of this experiment was to examine how infants and toddlers from monolingual and bilingual families, develop vowel processing from infancy into childhood. We presented the English vowel contrast /I/-/ɛ/ to 30 three-to-18 month old infants, 30 18-47 month old toddlers and 28 4-7 year old children in a passive listening task while collecting event related potentials. We also collected a wide range of standardized language measures.

Results show that both monolingual and bilingual infants and toddlers show robust discriminative brain responses (positive Mismatch Response or MMR), around 200-300 msec. The positive MMR may index orienting to the change in stimuli, thus be related to the P3a component. It may also mask the negative MMR as suggested by Morr, et al., 2002. Some children in the infant and toddler groups showed a second, later positivity than MMR. Subtle differences in topography of the MMR in the bilingual and monolingual groups may indicate different contributions of the left and right hemisphere neural mechanisms.

Both the monolingual and bilingual groups of 4-7 year-old children show robust MMRs, but with a negative polarity, similar the adult MMN along with a later large negativity around 400 ms, which is also found in adults. However, as in the infants and toddlers, topographical differences in the distribution of the MMNs and LPs are apparent, in that the monolinguals have a more lateralized topography. This suggests different contribution of some underlying neural generators. These findings indicate that the nature of the language input influences the contributions of neural activity from different brain regions to speech processing and not only the amplitude and also the latency of MMR responses.

Brain indices of speech discrimination in 8-10 year-old children

Nancy Vidal[1], Arild Hestvik[2], Hia Datta[1]
[1]City University of New York, [2]University of Delaware

In this experiment we examined the attention related discrimination processes for the English vowel contrast /I/-/ɛ/, as indexed by ERPs. We were interested in examining how 8-10 year old monolingual and early bilingual children develop these processes. Further, we wanted to know how attention and speech perception was related to their language processing as measured by standardized language measures such as the Clinical Evaluation of Language Fundamentals and Peabody Picture Vocabulary Test.

The vowels were presented in an oddball paradigm, with /ɛ/ as the repeating standard and /ɪ/ as occasional deviant sounds. The three task conditions included a) ignore all sounds b) attend to embedded target tones and c) attend to embedded consonant-vowel (CV) syllables in the auditory stream of vowels. The aim was to observe what mechanisms these monolingual and bilingual children used to discriminate English short vowels, when their attention was diverted to a competing set of sounds such as tones or CVs.

The results indicated that both groups show robust late negative responses around 400-600 msec and a smaller MMN. However, the bilingual group appears to have a smaller late response compared to their monolingual peers. This might indicate that the bilingual children, similar to adults, deploy attention differently in a speech perception task relative to the monolingual children (Datta, Shafer, Schwartz, & Morr, in preparation). Again, topographical differences across the groups were also evident.

Brain indices of speech discrimination in adults

Hia Datta[1], Arild Hestvik[2], Nancy Vidal[1], Miwako Hisagi[3], Carol Tessel[1], Marcin Wroblewski[1]
[1]City University of New York, [2]University of Delaware, [3]The Massachusetts Institute of Technology

We conducted a study on adult monolingual and bilingual participants using an attention manipulation on a speech perception task. We tested the English vowel contrast /I/-/ɛ/ presented in an oddball paradigm, while we measured Event Related Potentials from 64 scalp sites. The vowels were presented in an oddball paradigm, with /ɛ/ as the repeating standard and /I/ as occasional deviant sounds. The three task conditions included a) ignore all sounds b) attend to embedded target tones and c) attend to embedded consonant-vowel (CV) syllables in the auditory stream of vowels. The aim was to observe what mechanisms these monolingual and bilingual adults used to discriminate English short vowels, when their attention was diverted to a competing set of sounds such as tones or CVs.

Results indicate that both groups show robust Mismatch Negativities (MMNs) across all attention conditions. We also observed a later negativity (LN) between 300-600 msec for both monolinguals and bilinguals. The LN however, appears to change with attention conditions across language groups. Earlier studies in adults have suggested a relationship between the LN and attention. Thus, given early enough exposure to two languages, bilingual adults appear to perform similarly to their monolingual adults without focused attention, but the two groups may differ in how they deploy attention within a speech perception task.

Symposium Session 9 - Friday 1 August 09.00 - 11.00
Symposium Number – S9-5

Chair: Blanca Schaefer, *University of Sheffield*
Discussant: Blanca Schaefer, *University of Sheffield*

The role of language components in literacy development: Views from multiple methods

Description:
There is substantial empirical evidence that language development is a key prerequisite skill for literacy development. The qualitative and quantitative impact of different aspects of language on early literacy is discussed.
Many aspects of language development, including phonological processing, (in particular phonological awareness and rapid automized naming), speech, vocabulary, comprehension skills and metalinguistic knowledge are important for literacy development. Consequently, there is a need to explore the links between language and literacy and the predictive power of language skills on reading and writing in different linguistic environments. This symposium attempts to approach this complex discussion from different theoretical and empirical perspectives.

Prior research in English-speaking children provides evidence that phonological awareness (PA) and rapid automized naming (RAN) are important predictors for later literacy development. Two studies in this symposium examine the role of these two factors in other languages with more transparent orthographies. The first study explores those interrelations in Greek. Focussed on phonemic awareness and RAN accuracy and fluency respectively, findings support the predictive power of both components for reading acquisition. The unique contribution of accuracy and fluency measures on different aspects of reading are highlighted.
PA is a complex construct, comprising different levels of metalinguistic consciousness and different linguistic units (syllables, onset-rhymes and phonemes). There is still a controversy which levels and which units are most predictive for literacy development. The second study aims to assess in depth the individual components of PA and their predictive power on early literacy development in German-speaking children. Cross-linguistic similarities and differences are discussed.

Although the role of PA has been a major area of research, fewer empirical studies have been conducted to explore a wider range of language skills and metalinguistic awareness, and the next two studies examine this issue. The third study discusses the predictive relationship between PA, syntactic and semantic awareness and various aspects of literacy acquisition. Findings from children of a large range of reading proficiency will be considered and quantitative and qualitative differences outlined. Those comparisons of clinical versus non-clinical populations provide a valuable source to understand relationships and dependencies between child language development and emergent reading and writing skills.

The last study explores similar issues. The correlations between language, speech, phonological processing and literacy development in different groups of children with and without various communication difficulties are examined in an effort to determine which elements of speech and language difficulties are most closely linked with literacy difficulties.
In sum, the symposium aspires to approach the impact of language skills on early literacy development from a comprehensive, cross-linguistic perspective.

A study of literacy acquisition in Greek: An investigation of the specific contributions of phonological awareness to early reading development in a transparent orthography

Dimitra Ioannou, Margaret Snowling, Emma Hayiou-Thomas
University of York

Recent research on early literacy acquisition has demonstrated that children learning to read in transparent orthographies make greater gains in phonological awareness and in word recognition speed during the first years of schooling than do learners of English. As a result, a growing amount of evidence attests to the importance of more sensitive measures of reading ability and phonological skills for identifying disabled readers in more regular alphabetic scripts than English.

The contributions of general cognitive ability (assessed by one measure of nonverbal ability and a measure of vocabulary knowledge), phonological awareness and rapid automatised naming (RAN) to early reading development was examined in a cohort of 60 Greek speaking children at the end of their first grade in school. Measures of explicit manipulation of phonemes (phoneme deletion and substitution) as well as measures of the time to complete phonological awareness tasks were included in the battery. In order to assess reading ability, two measures were employed: a speeded word recognition task (the sight word efficiency test) and a nonword reading test which yielded two measures of decoding skill: accuracy and reading rate. Phonological awareness and rapid naming were expected to be strong predictors of reading in Greek. The lack of previous studies did not allow us to set a hypothesis about the role of phoneme awareness response time as a predictor of reading in the Greek sample. However, if this measure is a more sensitive index of phonological awareness than the accuracy measure, we would expect it to predict variations in reading speed and accuracy. Results indicated that once general cognitive ability was controlled, both phoneme awareness response time and RAN were significant independent predictors of sight word efficiency, while phoneme awareness accuracy was a unique predictor of nonword reading accuracy. Phoneme awareness response time and RAN effects were independent predictors of nonword reading rate.

The findings of the present study add to the growing body of research in the reading development in the transparent Greek orthography and suggest that there are similar predictors of reading skill in English and Greek. Phoneme awareness appears to be a core component skill of alphabetic literacy, while phoneme awareness time provides a sensitive index of phonological awareness skill which can predict variations in reading fluency in consistent orthographies. It is further argued that phonological response time measures could be a valuable tool of diagnostic purposes of reading disabilities in a regular written language.

Components of phonological awareness and their predictive power for early literacy development in German-speaking children

Silke Fricke[1,2], Blanca Schaefer[1], Joy Stackhouse[1], Marcin Szczerbinski[1], Bill Wells[1], Annette V. Fox-Boyer[2]
[1]University of Sheffield, [2]University of Applied Sciences Fresenius Idstein

The nature of speech, oral and written language deficits is controversially discussed. The general domain approach argues for a phonological processing deficit underlying language and literacy impairment (e.g. Leitao, Hogben & Fletcher, 1997). Phonological processing comprises the use of phonological information in order to process language. It includes storing (e.g. tested by the repetition of nonwords) and retrieving of phonological information (e.g. tested by rapid automized naming) and phonological awareness (PA). Within the phonological processing abilities PA has been confirmed for much alphabetic orthography to have a significant relationship with literacy development. PA, the ability to reflect on the sound structure of a word independent of its meaning, is a multilevel construct which is often divided into three linguistic unit sizes, i.e. syllables, onset-rhyme and phonemes, and, on the other hand, into four levels of explicitness of operations, i.e. identification, segmentation, synthesis and manipulation. Even if empirical studies have shown a strong causal relationship between phonological awareness and literacy, the influence of different linguistic sizes and levels of explicitness seems to differ for different languages and orthographies. As yet little is known about the impact of different levels of PA on

literacy development in transparent orthographies like German. There is some empirical evidence of cross-linguistic differences, showing e.g. those phoneme segmentation skills highly impact on reading and writing in English-speaking children but less on German-speaking children (e.g. Landerl & Wimmer, 2000). However, in most studies only a selection of PA levels was assessed. Hence, a more in depth exploration of PA skills and their relation to literacy in German is needed.

For that purpose a broad-spectrum PA test battery, considering the different linguistic units and levels of explicitness, was developed and standardized. It allowed for the first time to collect comprehensive normative PA data of typically developing German-speaking children. Results from 2 pilot studies (n = 55) and 2 short-term longitudinal studies (n = 175) showed substantial test reliability and validity. 79 typically developing German-speaking children aged 5;3 - 6;8 at T1 were longitudinally tested (preschool - end of 1st grade) to explore their PA and early literacy skills. The assessment included the tasks of the newly designed PA test battery (syllable segmentation, rhyme identification and production, onset-rhyme blending, sound identification, phoneme blending, phoneme deletion), speech and language tests, rapid automized naming tasks and a letter-knowledge screening. Different literacy components were assessed by using tests for reading comprehension, reading accuracy, reading fluency (reading speed) and writing.

A detailed view on the results revealed that syllable awareness did not significantly correlate with early reading and writing skills in German, whereas onset-rhyme awareness and phoneme awareness showed constant statistically significant correlations with early literacy skills. Multiple regression analyses confirmed the significant role of PA and its independent concurrent and predictive power for early literacy development. Those findings and further in depth analyses of the cross-sectional and longitudinal data will be summarized and cross-linguistic differences will be discussed.

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The role of phonological and syntactic and semantic awareness in learning to read: Results from a longitudinal and intervention study

Kerry Bannister, Nicola Botting, Victoria Joffe
City University

The role of phonological awareness (PA) in learning to read has been established through numerous correlational and longitudinal studies of both normally developing readers and children with reading difficulties. Various training studies have also reported the effectiveness of training phonological awareness skills on reading performance.

There have been fewer studies focusing on the role of syntactic and semantic awareness (SASA) in reading development, and these studies have reported conflicting findings. This presentation will report findings from a longitudinal research project on the role of PA and SASA in reading development in 60 seven to eight year-olds with a range of reading abilities.

The longitudinal data is part of a wider, combined longitudinal and intervention study which investigated:

(1) Predictive relationships between PA and SASA and word decoding, reading comprehension and the use of context in a short-term longitudinal study of average and below-average readers, and

(2) The relative effectiveness of PA versus SASA training on reading and the use of context in below-average readers.

The longitudinal data was collected soon after all children had completed Key Stage One literacy assessments. This allows us to compare the scores obtained in the school-based standardised assessments with standardised word reading, decoding and reading comprehension measures.

In addition, the participants in the study included both native speakers of English and children with English as an Additional Language. This addresses the realities of modern primary schools in the UK, particularly in inner city schools where pupils come from a wide range of ethnic and language backgrounds. This allows us to compare metalinguistic awareness skills and reading development in young speakers of English as an Additional Language and native English speakers.

The research therefore has important implications for our understanding of literacy and the differential roles of phonological awareness and syntactic awareness in literacy development.

Speech, language and literacy difficulties: What are the links?

Julia Carroll, Joanne Myers
University of Warwick

Previous research has indicated that children with both speech and language difficulties are likely to go on to have additional literacy difficulties, while children with 'pure' speech difficulties do not tend to go on to have literacy problems. There are at least two possible reasons for this finding. One is that early difficulties in language directly influence literacy development. Another is that phonological processing difficulties may be a common cause of language, speech and literacy difficulties in these children. It is well established that difficulties in phonological processing can cause difficulties in speech (Stackhouse & Wells, 1997) and alphabetic literacy (Snowling & Hulme, 1994), but children who have difficulties in remembering and working with the sounds of spoken language are also likely to show smaller vocabularies and difficulties in understanding complex sentences (Chiat, 2001). While there are some children who have language difficulties in the absence of phonological difficulties, there are many for whom the difficulties co-occur and it is difficult to disentangle causal mechanisms.

Previous research has used group comparisons to assess the relationships between speech, language and literacy. This approach is somewhat artificial, since children show a wide range of different combinations of difficulties, and it can be difficult to assign children to different groups effectively. Group comparisons tend to regard variation within groups as unimportant, whereas we believe that it may play a vital role. We intend to use a methodology similar to that used by Griffiths and Snowling (2002) to assess the role of individual differences in predicting progress. We use this approach to examine the relationships between phonological processing, speech, literacy and language in a large sample of 4-6 year old children with and without a wide range of communication difficulties. We aim to have a sample of 80 typically developing children and 120 children with potential communication difficulties. Data collection is ongoing, but at present we find moderate positive correlations between each area of processing. Further analysis will provide more detailed information about the relationships between these four areas in children. We will also use individual case studies to illustrate the relationship between different skills at an individual level.

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Symposium Session 10 - Friday 1 August 14.30 - 16.30
Symposium Number – S10-1

Chair: Chloe Marshall, *University College London*
Discussant: Heather van der Lely, *University College London*

The role of phonological deficits in Specific Language Impairment (SLI) and dyslexia

Description:
Controversy surrounds the nature of Specific Language Impairment (SLI) and Dyslexia, the extent of their overlap and whether they reflect a common underlying deficit. Some see SLI as a severe form of Dyslexia, while others argue that they are separate deficits that commonly co-occur. Deficits in phonology are core to many of these models. However, the nature of the phonological deficit in the two disorders, and whether it is identical in both, is not well understood.
The phonological deficit in dyslexia affects the manipulation of phonological representations (e.g. phoneme deletion tasks), the retention of verbal material in short term memory (e.g. non-word repetition and digit span tasks), and access to phonological representations (rapid naming tasks). What underlies this phonological deficit is less clear – fuzzy representations, over-specified representations, limited working memory capacity and speech perception problems have all been claimed to be the cause, and these might be interconnected.

The picture with regards to SLI is even more muddled. While SLI children have also been reported to have difficulties with speech perception, phonological working memory and phonological representations, previous studies have not often distinguished between SLI and dyslexia, and deficits are usually only shown by a proportion of children in the two groups. Some researchers have claimed a direct link between poor speech perception/phonology and the types of syntactic impairments characteristic of SLI, but this link is disputed by others.

A better understanding of the phonological deficit in SLI and dyslexia promises to shed light on (1) why there is a large, but incomplete, overlap between the two disorders, (2) why there is heterogeneity within these disorders and (3) what their underlying causes are. This symposium explores our most current understanding of the relationship between phonology, the cognitive processes most immediately related to phonology (speech perception, phonological short-term memory), and language and literacy deficits.

Phonological development in young children at risk of dyslexia and young children with SLI

Elise de Bree, Frank Wijnen
Utrecht University

The Utrecht Dyslexia and SLI project compared the language development of Dutch children with a familial risk of dyslexia with normally developing children (1;6-3;0), as well as with children with SLI (3;0 to 5;0). The first aim was to establish whether precursors of dyslexia can be found in the linguistic performance of the at-risk children, of whom between 30 and 65% are expected to become dyslexic. A second aim was to assess whether the at-risk and SLI groups show similar areas of weakness and similar performance on a variety of language tasks.

The subproject reported here specifically focused on the phonological development of the three groups of children. A number of different tasks were used, tapping phonological acquisition (speech production, word stress acquisition, morpho-phonological alternation of the plural), as well as phonological processing and awareness (non-word repetition and rhyme oddity).

The data show that the phonological deficit hypothesis of dyslexia demands refinement, as not all tasks render clear differences between the control and at-risk group. They further show that a linguistically-informed approach leads to new insights. Secondly, the results favour a model that treats dyslexia and SLI as two separate disorders. Superficially, the at-risk and SLI groups are similar with poorer performance than the control group, but closer inspection discloses (subtle) qualitative differences between them. In addition, differences between the groups arise on measures outside the phonological domain. Thus, it is likely that other (cognitive and linguistic) factors impact on the phonological deficit.

Follow-up data of the at-risk and SLI children will also be discussed, specifically regarding phonological processing abilities. A relationship between preschool non-word repetition abilities and subsequent literacy abilities of at-risk children is attested, but this is not the case for the SLI group, where non-word repetition is always poor.

Phonological short-term memory in children with SLI

Lisa Archibald
University of Western Ontario

One of the most consistently reported impairments in SLI is a difficulty repeating novel multisyllabic phonological forms. Difficulty recalling nonwords has been reported also as a common characteristic of dyslexia. Poor nonword repetition has been attributed to a deficit in phonological short-term memory. It has been suggested that phonological short-term memory, the ability to hold phonological information in mind for brief periods of time, plays a role in aspects of language acquisition such as early learning of the phonological forms of lexical items. A phonological short-term memory deficit, then, may impair word learning, which in turn may interfere with language or literacy development. More recent work, however, suggests that a phonological short-term memory deficit is insufficient *on its own* to result in a lasting impairment such as SLI.

We compared the performance of 12 children with SLI (7-12 years), typically developing aged-matched children, and typically developing children with similar receptive vocabulary levels on tasks that tapped either short-term memory only or posed working memory demands combining processing and storage. This study further examined domain specificity in short-term and working memory deficits in SLI by presenting tasks that employed either verbal or visuospatial demands. The groups performed at similar levels on both the phonological and visuospatial short-term memory tasks. Some qualitative differences existed between the SLI and age-matched groups on the phonological short-term memory task only in that the responses of the age-matched group contained more accurate information. The ability of the SLI group to store phonological information, however, was markedly impaired when concurrent processing of either verbal or visuospatial information was required. Similarly, children with dyslexia have been found to be particularly impaired on tasks involving concurrent storage and processing of phonological information.

Several possible explanations of these findings will be discussed. It may be that information processing is sufficiently demanding for children with language learning impairments (LLI) as to prevent the use of strategies to support retention of phonological information such as rehearsal. Another possibility is that the phonological information briefly retained by children with LLI is fragile in nature making

it more susceptible to loss and error when the system is otherwise engaged. In the case of SLI, it may be that a double deficit exists involving both a phonological deficit and an overall slower rate of processing and that when task demands simultaneously tap both of these areas, the impairment is magnified.

Speech perception and phonology in developmental language and reading impairments: What's the connection?

Marc Joanisse[1], Erin Robertson[2]
[1]*University of Western Ontario,* [2]*Universite du Quebec à Montréal*

Studies have identified speech perception and phonological processing deficits in both developmental dyslexia and specific language impairment (SLI). These data might suggest that both disorders stem from the same underlying problem with speech processing. On the other hand, few studies have examined both groups simultaneously, raising the question of whether both impairments are indeed fundamentally the same or different. We examine speech and language processing in dyslexia, compared to children with poor receptive grammar. Our data indicate significant phonological awareness and phonological STM difficulties in both disorders. However, language impaired children exhibit greater evidence of categorical speech perception deficits, as measured using both behavioral and evoked potentials (ERPs). The data suggest that although phonological deficits are implicated in both SLI and dyslexia, these are independent of speech perception problems. We hypothesize instead that language and reading impairments stem from subtly different problems with how children perceive and process the phonological form of language.

Relationships between phonological and syntactic deficits in older children with SLI and/or dyslexia

Chloe Marshall[1,2], Heather van der Lely[1]
[1]*University College London,* [2]*City University*

At least some children with SLI have difficulties with the intrasentential assignment of reference to pronouns (him, her) and anaphors (himself, herself), as measured by the Advanced Syntactic Test of Pronominal Reference (ASTOP). Whereas van der Lely and Stollwerck (1997) claim this is as a result of grammar-specific deficit, Joanisse and Seidenberg (2003) claim that the data can instead be modeled in a connectionist network via the simulation of a phonological deficit. We tested the latter claims by administering the ASTOP and tasks of speech perception and phonological working memory to groups of children with SLI (aged 10-14) and typically developing language and age-matched controls. We also tested a group of children with SLI+dyslexia and a group with dyslexia-only (aged 10-14). Children with dyslexia provide a valuable comparison to SLI because they too have been reported to have speech perception and phonological working memory deficits.

SLI+dyslexic children performed particularly poorly on the ASTOP and all speech perception/phonological working memory tasks. SLI-only children performed poorly on the ASTOP, and both the SLI-only and dyslexia-only groups performed poorly on the speech perception/phonological working memory tasks, as expected. However, when the results were entered into a regression model, the speech perception and phonological measures accounted for 24% of the variance in ASTOP scores, which, while statistically significant, still leaves 76% of the variance unaccounted for. This begs the question of how much variance a model that attempts to account for syntactic deficits solely via speech perception and phonological deficits should be expected to capture.

In order to address this question, and further elucidate the relationship between speech perception/phonology and syntax, we also investigated the ability of speech perception and phonological scores to predict performance on two additional syntactic tasks – the Test of Active and Passive Sentences (TAPS) and the Verb Agreement and Tense Test (VATT). Again, the SLI groups performed poorly on these tasks. This time, speech perception/phonology accounted for 12% of the variance in TAPS scores and 53% of the variance in VATT scores. We interpret these differences between tasks as indicating that some linguistic structures rely more heavily on perceptual and phonological skills than others, but that a model of independent yet cumulative deficits in syntax, morphology and phonology (the Computational Grammatical Complexity hypothesis, Marshall and van der Lely, 2007) best captures the SLI data.

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Symposium Session 10 - Friday 1 August 14.30 - 16.30
Symposium Number – S10-2

Chair: Napoleon Katsos, *University of Cambridge*
Discussant: Richard Breheny, *University College London*

Development at the grammar/pragmatics interface: Implicature, presupposition, focus, quantifier scope, and (over)literal interpretation

Description:

Recent theoretical accounts of the grammar-pragmatics interface have taken a psychologically-oriented approach and have spelt out concrete predictions for the pattern of acquisition of these phenomena (Chierchia, 2003; Carston, 2002; Levinson, 2000 i.a.). This experimental turn provides a unique opportunity for the developmental researcher to investigate the interface between two distinct domains of the language system which has so far evaded attention. Competence with regards to implicature, presupposition, focus, quantifier scope, the interpretations of logical connectives, direct and indirect speech acts and (over)literal interpretation i.a. requires both grammatical skills (e.g. syntactic and semantic competence in terms of scope, c-command, entailment, monotonicity) but also pragmatic skills (e.g. in terms of Gricean maxims of relevance, quantity and quality, considerations about the interlocutors' epistemic state and cooperativity among others). In this panel we raise questions such as: 'What is the extent of children's competence at the grammar / pragmatics interface?', 'Is there some developmental stage where information from one domain is privileged compared to the other?', 'What are the factors that may give rise to crosslinguistic variation?'

PAPER1 investigates the acquisition of scalar implicatures and reveal a developmental pattern whereby young children only access the semantic meaning of scalar expressions. However, once children do master the computation of implicatures, they seem unable to 'undo' certain types of implicature in speech acts contexts where it is not warranted.

PAPER2 follows up on previous research into the inclusive and exclusive reading of the disjunction which observed that children were being 'illogical' by treating certain disjunctions as conjunctions. The authors present evidence that children and adolescents are in fact far from illogical, and that they are construing a 'free choice' interpretation of the disjunction, which is licensed by considerations of the speaker's epistemic state.

PAPER3 addresses a perennial topic in the grammar-pragmatics interface, that of presuppositions, and present evidence about acquisition by very young children. While children seem proficient in the use of these expressions, it is far from clear whether they have a full understanding of the semantics and pragmatics of these expressions and in particular of the presuppositional inference.

PAPER4 addresses a recent debate on quantification and scope in child language where data have come mostly from English and Kannada. The author's contribution comes from a developmental study on Italian, where word allows both pre- and post-verbal subjects. The author obtains evidence about preferred interpretations based on syntactic c-command relations (rather than semantic relations), and she also identifies across-the-board difficulties with pre-verbal subjects. The authors of

PAPER5 are compiling a corpus of conversation data from children with Autistic Spectrum Disorders or Pragmatic Language Impairment. The aim is to identify instances of over-literal language and to account for them in terms of ego-centricity through the miscomputations of lexical features (e.g. meaning dominance, concreteness) and lexical relations (e.g. metonymy, hyponymy).

A developmental investigation on the effects of scale type and speech-act on the generation of scalar implicatures

Napoleon Katsos[1,2], Dorothy Bishop[2]
[1]University of Cambridge, [2]Oxford Study of Children's Communication Impairments

Recent investigations in the acquisition of scalar implicature (SI) have consistently revealed a developmental pattern, whereby very young children do not generate SIs (the age at which children exhibit adult-like performance can vary significantly, depending on the specifics of the task; Guasti, et al 2005; Noveck, 2001; Papafragou & Musolino, 2003; Pouscoulous et al, 2007 i.a.). Most of these investigations have focused on the SI associated with the existential quantifier 'some' ('some As are B' implicates 'not all As are Bs') in various languages. What is not clear is whether these tasks measure the ability to generate the specific SI which is associated with this particular expression, or the ability to generate SIs across-the-board. Such concerns are raised because the SI associated with 'some' relies on the so-called *logical lexical scale* <some, many, most, all> (Horn, 1989). There are other scales that are only construed in specific contexts. For example, an utterance of 'the monkey fed the pig' implicates 'the monkey did not feed the chicken' only if in a particular context there, exists some chicken that the monkey could have fed as well. Such scales <{pig}, {pig, chicken}…> where the ordered alternatives depend on the situational context are known as *ad hoc* scales.

Research question: Is there a difference in the pattern of acquisition between SIs triggered by lexical and ad hoc scales? Hypothesis 1: SIs that rely on logical lexical scales are privileged in the pattern of acquisition compared to SIs that rely on ad hoc scales (Chierchia, 2004; Guasti et al, 2005). Hypothesis 2: The type of scale is not important, because the underlying reasoning in either case is identical (Carston, 2004; Papafragou & Tantalou, 2005).

Experiment 1: 76 English-speaking children (aged 5, 7, 9 and 11 years old) and 10 adults took part in an underinformative-utterance (UU) task, where a puppet-character utters a sentence with a scalar term. If the scalar term is understood with an SI, then the utterance must be rejected. *Results*: 5-year-old children did not reject under-informative utterances with 'some' or ad hoc implicatures (18% and 17% rejection rate respectively). 9- and 11-year-olds rejected both types of SI equally (70% and 68%; 85% and 81% respectively); adults rejected both types at above 90%. The 7-year-olds rejected more underinformative utterances with ad hoc SIs relative to lexical SIs (25% vs. 60%), contrary to any hypothesis. In a follow-up Experiment 2 with 9-, 11-year-olds and adults (n=45), the utterance with the scalar term was uttered as a bet or as a guess of what *will* happen (rather than a description of what has already happened). In these speech-act contexts, the utterance with the scalar term is not under-informative and ought not to be rejected (see Chierchia et al 2001).

Results: Utterances with either lexical or ad hoc SIs were rejected significantly less frequently than in experiment 1. However, utterances with 'some' were rejected more than utterances with ad hoc SIs for all three age groups.

Conclusions*:* A complex effect of scale-type and speech-act is revealed: in the trajectory of acquisition, there is no advantage of lexical scales but rather an advantage of ad hoc scales. Once the ability to consistently generate SIs has been acquired (ages 9 and above in experiment 2), SIs based on lexical scales are more 'resilient' and will be generated even in contexts that do not warrant them. We discuss the theoretical implications for default and context-dependent accounts of SIs.

Over-literal interpretation in pragmatic dysfunction

Peter Collins, Dorothy Bishop
Oxford Study of Children's Communication Impairments

Much research into how autism affects language has stressed dissociation between formal grammatical aspects of speech, such as syntax, and more context-dependent aspects such as pragmatics. On the one hand, even young children with autism readily use syntactic information in interpreting utterances (Paul, Fischer & Cohen, 1988). On the other, people with autism at whatever age, proto-typically, do not recognize the communicative principle that underlies normal language use (e.g. Kanner, 1943), leading to a profusion of non-communicative or 'ego-centric' language such as irrelevant or purposeless remarks, repetition, thinking aloud and echolalia (Cunningham, 1968; Szatmari, Bartolucci & Bremner, 1989). They, further, often produce discourse that is strained or incoherent (Baltaxe & D'Angiola, 1992). Empirical explorations of such deficits have focused on supposed pragmatic-computational mechanisms, and have posited specific impairment of a capacity for meta-representation or Theory of Mind (e.g. Happé, 1991). Few studies have investigated potential deficits to the semantic/conceptual systems which would feed into these pragmatic mechanisms. Those studies that have, have treated anaphoric and deictic language use, finding that speakers with autism refer more often, compared with controls, to the physical world than to the shared conceptual world created through discourse (Fine, Bartolucci, Szatmari and Ginsberg, 1994), and that they show high error rates with temporal and spatial deictic expressions (Perkins, Dobbinson, Boucher, Bol & Bloom, 2007). The present project builds on the findings of such studies by treating conceptual deficits in autism and related pragmatic disorders through an analysis of the phenomenon of 'over-literal interpretation', wherein a hearer misinterprets an utterance by assuming a tight, literal meaning of an expression when a looser, non-literal meaning was intended. Witness the child who, when handed a glass of milk and told to, 'Put your milk on the table', pours the milk onto the table, and the child who, when asked 'Mind if I join you?' replies 'With this?' and offers his interlocutor some adhesive tape (Boden, personal communication). As in Dobbinson et al (2007), this project consists in compiling a corpus of linguistic examples to analyze linguistically within a framework of lexical semantics and lexical pragmatics. Compilation has already begun using transcribed conversations with children with autism or Pragmatic Language Disorder and normal controls, from the Oxford Study in Children's Communication Impairments, and using examples donated by clinicians and academics. The resulting corpus will shortly be put online. It is hoped that this project will uncover lexical features (e.g. meaning dominance, concreteness) and lexical relations (e.g. metonymy, hyponymy) that contribute to over-literal interpretation and that miscomputations of these will, at least partly, explain why 'ego-centric' language is triggered. Since the corpus will contain the discourse context in which the over-literal interpretations occurred, it will be possible to analyze the language directed at children with pragmatic disorders, albeit language from an atypical speech context. This may allow an estimate of how the strategies that normal speakers adopt in conversations with people with pragmatic disorders contribute to misunderstandings and conversational dysfluency (Hobson, 2002). This study is a prelude to experimental work.

Presupposition in young children

Nausicaa Pouscoulous, Elena Lieven, Michael Tomasello
Max-Planck-Institute for Evolutionary Anthropology

A presuppositional expression indicates that some piece of information is already part of the common ground between speaker and hearer. The paradigm cases of presupposition are pieces of information which are associated with certain lexical items or syntactic constructions. There are many such items and constructions, for instance: transition verbs, cleft sentences, definite descriptions, selection restrictions of various kinds and focus particles such as *again*, *more* and *too*.

a. Fred was snoring, too.
b. Someone other than Fred was snoring.

Someone who utters the sentence (a) takes it for granted—or considers it given—that the corresponding sentence (b) is true. Hence, there is a crucial difference in information status between that part of the (a) sentences that is captured by the (b) sentences, and the remainder of the content they convey. For example, (1a) *states* or *asserts* that Fred was snoring, and it *presupposes* that he wasn't the only one to do so.

This study addresses the question how and when children learn to deal with the presupposed content of an utterance. Discourse particles such as *again*, *more* and *too* are particularly interesting for such an investigation, since in many languages children seem to master their use extremely early (see, for instance, Hüttner, Drenhaus, van de Vijver & Weissenborn, 2004 for a review on the production of the German *auch*). The main focus of the developmental literature on discourse particles so far has been on children's understanding of expressions like *again* (and its German and Dutch counterparts) in contexts where its scope (over the subject or the object of the action) is ambiguous (e.g. see Berger, Müller, Höhle & Weissenborn, forthcoming; Bergsma, 2004; Hüttner, Drenhaus, van de Vijver & Weissenborn, 2004; on *only*, see also Paterson, Liversedge, Rowland & Filik, 2003 and Gualmini, Maciukaite & Crain, 2003). These studies also tend to be concerned with relatively old children (typically 4-to-10-year-olds).

The aim of this study is to establish whether younger children (from age 2;6 on) are able to draw the presuppositional inferences linked to the expressions *too* and *again* ('*auch'* and '*nochmal'* in German). At this age, children are proficient in their use of these expressions, but it is not clear that they fully appreciate their semantic and pragmatic import. We present children with two toy characters, one of which performs an action (e.g., jumping). The child then hears either the phrase, "Anna wants to jump, too," or "Anna wants to jump again." The child must make an inference based on the presupposition carried by either *too* or *again* in order to assign the correct referent to "Anna." We will present the results of this study and discuss the implications they have for the early understanding of presuppositions.

Symposium Session 10 - Friday 1 August 14.30 - 16.30
Symposium Number – S10-3

Chair: Seyda Ozcaliskan, *University of Chicago*, Jana Iverson, *University of Pittsburgh*
Discussant: Eve Clark, *Stanford University*

The contribution of gesture to language learning at different linguistic milestones

Description:
The symposium will examine the role of gesture in language development, from the first vocabulary spurt around 18 months of age to the development of complex narrative abilities in early school years. The symposium will explore three questions: (1) what is the role of gesture for language learning during moments of developmental transition, (2) does early gesture serve as an index of linguistic abilities at later stages of language development, and (3) how does gesture relate to linguistic abilities across different ages, languages, and populations. We will address these three questions across four different presentations.

The first presentation will focus on the earliest stages of gestural communication, and will explore how 14- to 18-month-old infants use gesture in relation to speech as they undergo their first developmental transition in word learning, namely the initial vocabulary spurt. The second presentation will focus on 14- to 34-month-old children, who have already established gesture-speech integration in their communications. The presentation will explore whether the early gesture-speech system serves an index of change in children's sentence-making ability, and whether delays in boys' early sentence constructions will become first evident in their gestures. The third presentation will take this finding one step further and ask whether early gesture serves as a predictor of linguistic abilities at a much later stage of language development. The talk will examine whether children's gestures (e.g., point at dog) and gesture-speech combinations ('doggie'+point at dog) at 18 months, selectively relate to children's vocabulary size and complexity of their sentences at 42 months. The last presentation will focus on a much later age group and examine 4- to 10-year-old children, as they are in the process of developing more complex linguistic abilities (i.e., narratives). The talk will address how children's gestures change as they produce more complex narratives and whether these patterns remain the same across different languages.

Overall, the symposium will contribute to our understanding of the close interaction between gesture and language development and show how this interaction plays out across different developmental periods, languages, and linguistic abilities.

Sex differences in language first appear in gesture

Seyda Ozcaliskan, Susan Goldin-Meadow
University of Chicago

Girls outperform boys in many aspects of language learning (Hyde & Linn, 1988; Maccoby, 1966). Girls not only produce their first words and first sentences earlier than boys, but they also develop larger vocabularies and use longer sentences than boys of the same age (Huttenlocher et al. 1991, Maccoby, 1966; Ramen, 1976). Is the process of language development the same for boys and girls despite these differences in attaining linguistic milestones? Previous work (Özçaliskan & Goldin-Meadow, 2005) has shown that, at the one-word stage, children use gesture to supplement their speech, turning a single word into an utterance that conveys a sentence-like meaning ('eat' + point at cookie). Soon after this point, the same children begin to produce sentences entirely in speech ('eat cookie'), suggesting that gesture is a harbinger of linguistic change at the early stages of language learning. In this study, we use the relation between gesture and speech to investigate whether gesture plays the same role in getting language learning off the ground in boys as it does in girls. Our two questions were: (1) Do the types of meanings girls and boys produce in their gesture-speech combinations herald the onset of these meanings in their two-word combinations? (2) Given the delays boys exhibit in speech relative to girls, do boys exhibit similar delays in their gesture-speech combinations?

To explore these two questions, we videotaped 22 girls and 18 boys in their homes interacting with their primary caregivers. Each child was videotaped for 90 minutes at 14, 18, 22, 26, 30, and 34 months. We found that both boys and girls used gesture to supplement their speech. More importantly, the types of supplementary gesture-speech combinations changed over time and presaged

changes in children's speech. Both boys and girls produced three distinct sentential constructions in their early communications: multiple arguments without predicates ('teeth'+point to toothpaste), single predicates with at least one argument ('hair'+WASH gesture), and multiple predicates with or without arguments ('Me scoop'+GIVE gesture), and they both produced each of these constructions in gesture+speech several months before they produced them entirely in speech. However, compared to girls, boys were delayed in their production of each of the three sentential constructions, not only in speech and but also in gesture+speech (see Fig.1).

These findings confirm that the gesture-speech system is a robust feature of the language learning process and offers insight into children's earliest abilities in sentence construction.

1A.Argument+Argument(s) 1B.Predicate+Argument(s) 1C.Predicate+Predicate

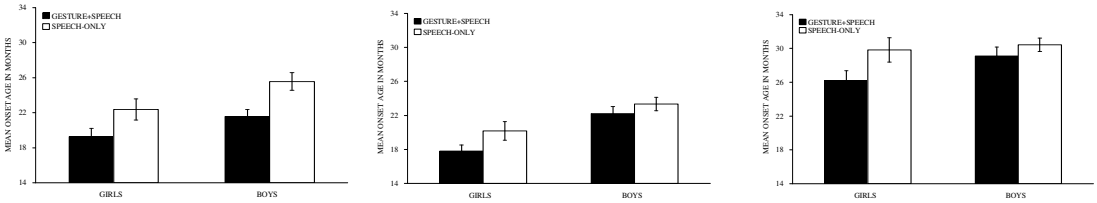

Fig.1.Mean age for the onset of utterances with two or more arguments (1A), utterances with a predicate and at least one argument (1B), or utterances with two predicates (1C) in speech-only (white bars) or in a gesture-speech combination (black bars).

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The interplay between speech, gesture, and affect during communicative transition

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The ability to coordinate expressions from different behavioural modalities, a crucial component in communicative development, highlights the dynamic organization of the communicative system. According to dynamic systems theory, periods of developmental transition are characterized by instability and inconsistency and therefore provide an opportune time frame in which to observe the underlying processes of change (Thelen & Smith, 1994). The vocabulary spurt is one such point in communicative development (e.g., Gershkoff-Stowe, 2001, 2002). The present study investigates the reorganization of communicative behaviours during the vocabulary spurt by considering whether the closely linked relationship between language, gesture, and affect is altered as the linguistic system undergoes a period of significant growth and increased instability.

Eighteen typically developing infants were videotaped during play with a primary caregiver one month before, at, and one month after the onset of the vocabulary spurt. Achievement of the vocabulary spurt was determined using data from the MacArthur-Bates Communicative Development Inventory (CDI; Fenson et al., 1993), collected bi-monthly from 2 to 19 months of age. Onset was defined as the first session at which infants gained at least 10 new words in a 2-week period, after already having acquired a base of 20 different words. Videotapes were coded for production of gestures, vocalizations, words, facial affective expressions, and communicative coordinations (i.e., instances in which there was some degree of temporal overlap between communicative behaviours).

Results indicated that the mean duration of coordinated bouts became briefer as infants gained experience in coordinating communicative behaviours $F(2, 34) = 9.68$, $p = .000$. In addition, there was a tendency for the mean proportion of synchronous coordinated bouts to increase over time, $F(2, 34) = 3.07$, $p = .060$. Data indicated that approximately 90% of all coordinated bouts involved a gesture. Although words occurred in bouts least often, the proportion of bouts including words increased across all sessions, $F(2, 34) = 6.52$, $p = .004$. Overall, gestures were significantly more likely to occur with words in coordinated bouts than affect, ps < .002. As expected, the mean proportion of communications that were coordinated bouts was lower at the spurt session compared to surrounding sessions, Mpre = .14; Mspurt = .11; Mpost = .15). There was also a trend for the mean proportion of words produced in coordination to decrease at the spurt session, $F(2, 34) = 2.81$, $p = .074$. Finally, consistent with expectation, when *new* words occurred, they were infrequently produced in coordination (Mpre = .07; Mspurt = .13; Mpost = .22).

These data are consistent with the notion that during a transition in communicative development, newly emerging behaviours (i.e., words, particularly those labeled as new) require additional effort for production and are less likely to appear in coordination with other behaviours. As the system regains stability and infants become more adept at coordination, the temporal union of communicative behaviours is strengthened. Findings are discussed in terms of understanding transitions as an opportunity for developmental change.

Children's use of gestures in narration: Evidence from three language/culture groups

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Once children are using multi-word utterances, gestures may serve as the foundation for complex language use. For example, Nicoladis, Mayberry, and Genesee (1999) found that preschoolers' iconic gesture rate was correlated with their mean length of utterance. In adults, gesture use has been associated with accessing low frequency words (Nicoladis, Pika, & Marentette, to appear) and word combinations (Beattie & Shovelton, 2000). The primary purpose of this study was to see if children in the late preschool and early school years use more gestures as their use of complex language increased. In this study, we operationalized linguistic complexity as the number of different word types (including both function and content words) the children used to tell stories.

A second purpose of this study was to test for the effects of age. From four years on, children tell increasingly more complex stories (McCabe, 1998). Gesture use has also been implicated in children's production of language in difficult tasks (Kita, 2001). Children's gesture rate might increase with age, as they tell more complex stories.

A third purpose of this study was to test for the cross-linguistic generalizability of the above findings, as well as compare the rate of gestures across languages/cultures. There have been some reports that some languages/cultures are associated with a higher gesture rate than others. For example, Graham and Argyle (1975) reported that Italians relied more on gestures in interpreting speech than Britons.

Thirty children from each of the following groups participated in the study: 1) monolingual English living in Alberta, 2) monolingual Spanish living in Chile and 3) monolingual French living in Quebec. The children were between 4 and 10 years of age, with equivalent

age distributions between all three groups. The children were asked to watch two short clips from Pink Panther cartoons and tell the story back to a native or fluent speaker of the language. The children's narrations were transcribed and coded for gestures. The rate of gestures was calculated as the number of gestures per word token. The number of word tokens can roughly correct for the differences between languages in terms of reliance on bound morphology (Goodz, 1989).

The gesture rate did not differ between the three groups (the average iconic gesture rate was around 2% in all three groups). The correlations between gesture rate and age did not always reach significance. However, within each group the rate of gestures correlated highly and positively with the number of word types that the children used.

These results suggest that children's use of gestures increases as their use of more different types of words increases. There is no evidence that children's gesture rate increases linearly with age and no evidence that there are cross-linguistic/cultural differences in the gesture rate within the groups tested here. We discuss these results in terms of the function of gestures as supporting complex linguistic production within this age range.

Gesture selectively predicts language learning

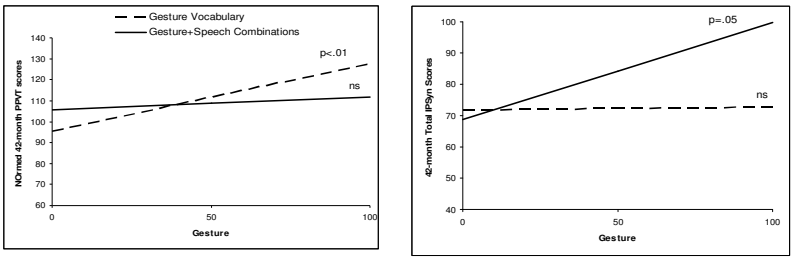
Susan Goldin-Meadow, Meredith Rowe
University of Chicago

The gestures children produce predict the early stages of spoken language development. Specifically, previous research has shown a link between early gesture use and early word learning (Acredolo & Goodwyn, 1988; Iverson & Goldin-Meadow, 2005; Rowe, Özçalıskan & Goldin-Meadow, In press), and between early gesture use and the onset of two-word speech (Butcher & Goldin-Meadow, 2000; Capirci, Iverson, Pizzuto & Volterra, 1996; Greenfield & Smith, 1976). Here we ask whether early gesture continues to predict language skills later in development and, if so, whether gesture is a global predictor of language learning, or if it is selective. That is, do particular uses of gesture early on predict particular language skills later in development?

To address this question we observed 52 children every 4 months from 14 to 42 months. We focused on two measures of gesture use during the early stages of language learning. (1) *Gesture vocabulary* was the number of different meanings the child conveyed via gesture (e.g., point at dog = *dog*; shake head = *no*). (2) *Gesture+speech combinations* were the number of utterances in which gesture and speech were co-temporally produced (e.g., point at cup+"mommy"). We used gesture measures from the 18-month interaction as predictors because that was the earliest time-point where most of the children produced both types of gestures and where all of the children were talking (so we could control for verbal skill). The number of child word types at 18 months served as a control measure of spoken vocabulary, and mean length of utterance (MLU) in words at 18 months served as a control measure of spoken syntactic skill. At 42 months, vocabulary skill was measured using the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1997) and sentence complexity was measured using the Index of Productive Syntax (IPSyn; Scarborough, 1990).

We find that early gesture use selectively predicts later lexical versus syntactic skill, even with early verbal ability controlled. Specifically, controlling for word types, the number of different meanings conveyed in gesture at 18 months predicts verbal vocabulary skill at 42 months, whereas number of gesture+speech combinations produced does not (Figure 1, left panel). In contrast, controlling for MLU, gesture+speech combinations at 18 months predict sentence complexity at 42 months, but meanings conveyed in gesture do not (Figure 1, right panel). We can thus predict particular milestones in vocabulary and sentence complexity at age 3 1/2 by watching how children move their hands two years earlier.

Figure 1. Effects of gesture vocabulary (dashed line) and gesture+speech combinations (black line) at 18 months on PPVT scores (left graph) and IPSyn scores (right graph) at 42 months controlling for early child spoken abilities (n=52).



Symposium Session 10 - Friday 1 August 14.30 - 16.30
Symposium Number – S10-4

Chair: Aliyah Morgenstern, *Ecole Normale Supérieure Lettres et Sciences Humaines*
Discussant: Dan Slobin, *University of California, Berkeley*

From variations to stability in child language: A multimodal and interdisciplinary perspective

Description:

Children are immersed in a universe permeated with variability. Their kinesics and linguistic productions most naturally reflect the very diverse input that surrounds them. However, the adults who interact with them manifest stabilities which children will progressively discover and appropriate.

Variations are natural and are due to the complexity of children's environment and to their own perceptions, affects and relations with people and objects. These are a driving force in the development of children's cognitive, social and linguistic abilities. Yet, from a very young age, children also show an ability to find stability. In the course of their development, they make their way along successive transitory systems with their own internal coherence. This phenomenon can be observed at all levels of linguistic analysis as it concerns phonology, morphology, syntax, pragmatics, semantics, prosody as well as gestures, facial expressions, and gaze in both spoken and signed languages. Most of the time, however, it is studied in separate and impermeable fields of research.

The aim of this symposium is to bring together specialists from various fields of language acquisition in order to tackle variation and stability from a multimodal and interdisciplinary perspective on the same longitudinal data consisting in spontaneous conversations between children and adults. The data presents its own variations, which depend on the child, the situation, and the interlocutors. The analyses aim at finding regularities in acquisition for each child and across the children.

All the researchers were given the video recordings and the transcriptions of the same three longitudinal follow-ups of French-speaking children (Léonard, Théophile and Madeleine) from eight months to three years old. The children were recorded at least once a month for an hour in their homes with their parents. One child was also recorded a second time every month for a whole day in order to

obtain denser data. Data from signing deaf children were used in order to conduct multi-modal comparisons. Each researcher analyzed the same data set according to their competence and conducted a study in parallel with the others. Meetings were organized in order to share observations, discuss results and have a better view of the interface between the different levels of children's linguistic development.

Four papers were selected for this symposium. The first paper shows that stable prosodic patterns with distinctive functions can be found as early as one year old. In the second paper, significant variations between pointing gestures in the three hearing children and in deaf signing children are analyzed. The third paper compares the three children's phonological systems and illustrates how phonological variations do not prevent emergence of grammaticality. The last paper examines some of the children's morpho-syntactic "errors" used with systematic pragmatic, discursive and syntactic functions.

Irregularities, "errors", deviant forms and the development of successive coherent transitory systems with stabilized elements are thus analyzed at the phonological, prosodic, morpho-syntactic and gestural level in order to try to reconstruct children's paths into the appropriation of language from multiple and mutually enriching perspectives.

The emergence of stable prosodic formats in adult-child interaction: From complexity to stabilization

Christelle Dodane[1], Karine Martel[2]
[1]Université Paul Valéry, [2]Université de Caen

In the field of language acquisition, most studies focus on the emergence of linguistic forms. It is indeed difficult to analyse vocal productions before the holophrastic period, not only because the productions of young children are highly variable according to the individuals, but also because clear relevant (pre-) linguistic units may not yet exist at this point in language development. However, the nature and function of pre-linguistic productions, as well as their prosodic variation, represent an important issue if we are to understand children's access to language.

In this paper, we assume that children's vocal productions are first characterized by a significant degree of variability, but specific forms gradually emerge, anchored in specific contexts (like the need to elicit or maintain the interaction with adults). This contextual anchoring might well be achieved through prosody (especially intonation contours), which would then represent one of the earliest levels of transition from variability to stability and from pre-linguistic to linguistic abilities. Variable acquisition paths will finally converge towards a common prosodic path for all children.

In order to make an inventory of the earliest stable prosodic forms in the pre-linguistic period, we analysed the productions of two French children between 10 and 18 months, occurring in spontaneous interaction with their parents. First, we tried to identify specific prosodic forms and their gradual stabilization for each child across time (individual prosodic path). Then, we looked for common prosodic forms produced by both children in order to identify the manifestation of a possible common prosodic path. According to our initial investigations, we could observe that despite some degree of variability, two categories of prosodic patterns emerge:

1) Self-centred vocal productions, when the child plays alone and handles objects. Most of these productions are characterized by falling contours, a specific duration for each child and an alteration of voice quality.

2) Clear vocal productions with specific intonation contours, when the child interacts with an adult. Several types of contours were observed: bell-shaped contours related to the initiation or maintenance of interaction, rising contours related to a specific gesture (giving an object to someone for example), specific intonation patterns related to a request for someone or something that was not present in the room, etc.

Even though we found variability among the children, some intonation contours were already stabilized as early as 10 months and were anchored in specific contexts. As the children develop their vocal productions, their repertory of contours increases and each of these contours is associated with an even more specific function in the interaction. Some of these functions are more general than those used by adults, but there is a gradual attenuation of the differences with time.

Therefore, it seems that the two children already have a complex prosodic system, which stabilizes before other language levels. This precocity may be due to a smaller inventory of units to master and a faster reorganisation from macro to micro units. The next issue would be to determine how these units combine together to allow the emergence of syntax in the next stages of the child development.

From gesture to word and from gesture to sign: Meaningful variations?

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[1]Université Paris 5, [2]Royal Effatha Guyot Group, [3]Université Lille 3

Pointing emerges thanks to the mastery of motor and cognitive prerequisites and it facilitates symbolization processes. It enables children to designate an object as a focus for joint attention thus paving the way to early language acquisition. Pointing can therefore be one of children's first symbolizing devices in the "joint attentional frame" described by Tomasello (1999).

For Clark (1978), early vocal demonstratives follow pointing, as children shift rather fluidly from pre-linguistic communication to linguistic communication in a sequence of stages. According to this perspective, pointing corresponds to a transition in the course of acquisition and facilitates access to combinations and early syntax. Pointing has a crucial role in the transition from one- to two-word speech. Gesture-word combinations help trigger the onset of two-word speech. Does this mean that one system really replaces the other? Or is there developmental continuity between pointing and first linguistic productions such as demonstratives? Such continuity between pointing gestures and language is questioned by Bellugi & Klima (1981) and Petitto (1986), based on their observations of pronominal inversions in signing deaf children. According to them, children's pre-linguistic gestures are different from signs despite the same handshape, and may correspond to two distinct categories of pointing gestures: some indexical, others symbolic.

In this paper, we explore the issue of (dis)continuity between gestures and words on the one hand, gestures and signs on the other hand, and compare the data taken from two longitudinal follow-ups of French- speaking children aged 8 months to three, filmed at home with their parents once a month, to data from deaf children using French Sign Language and Sign Language of the Netherlands.

Traditionally, researchers have attributed two functions to pointing gestures: they could be directive / imperative (used to ask for a desired object or event) or assertive /declarative (used to establish joint attention about an object or event). We closely examine each pointing gesture used by the hearing and deaf children in order to determine whether there are significant differences according to these two functions.

Our first analyses of the data show that for the hearing children, gaze does not seem to have a discriminating role in differentiating the functions of pointing. However pointing gestures are predominantly accompanied by vocalizations. The two modalities are therefore associated and complement each other from the very onset of pointing for hearing children. A prosodic study of the vocalisations that occur simultaneously to the pointing indicates that there are relevant differences according to proto-declarative versus proto-imperative functions. For the deaf children, both gaze and specific variations in the pointing movement, including rhythm, intensity, and length seem to lead to a categorization of the functions of pointing.

We therefore try to determine whether the same categories may be used to describe the visual-manual and auditory-acoustic modalities. There might be some cognitive differentiation, which would contribute to their complementary nature in hearing children and to specifically more "linguistic" uses of gestures in deaf signing children.

Variability of early phonological processes in French children: Implications for the study of children with SLI

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Many phonological theories underline the importance of phonological rules and processes to explain phonological changes during childhood. However, the analysis of the spontaneous language of young children suggests that phonological productions are very instable. In a previous study, the production of young French children with normal language development (NLD) (aged 2;3 to 4;0) was compared with the production of language-matched children with specific language impairment (SLI) (aged 3;0 to 7;0).

No difference in the nature and number of phonological processes could be found between the two groups, probably due to the important variety of errors found in both populations. This observation was not surprising for children with SLI (see Ingram, 1989). Their production of many atypical phonological processes is what is usually considered as a pathological marker for their language impairment. However, the huge variability of the NLD children productions had important implications. It interfered with a reliable descriptive or explanatory feature at the phoneme level in children before age 2;5.

The goal of the current work is to confirm that children with NLD produce instable phonological patterns by analyzing longitudinal data. Our hypothesis is that in the early stages, there is no regularity in the phonological processes of children although there could exist other types of phonological regularities such as phonotactic templates (Vihman & Croft, 2007).

The longitudinal corpus of three typically developing children (Léonard, Théophile and Madeleine) was used to control this hypothesis and to check whether the phonological processes and the variations from the adult target changed during language development. The children were followed at one-month intervals from age one year and a half to three. Each recording was transcribed for phonology and the phonological variations and processes were identified for each word produced by the child.

Results showed that the nature of the phonological variations and processes remained stable through development although the quality of phonological production increased in a dramatic fashion. The number of phonological differences between occurrences of the same word produced during the same recording diminished dramatically and the quality of the children's language improved from many errors and phonological variations to very few errors and variations. However, during this time, the nature of the variations and phonological processes did not change significantly. The only process that tended to disappear was deletion of syllables.

It seems that fine-grained variations in phonological production did not impair the development of language, thanks to the existence of stabilities at a more coarse-grained level which appeared before the emergence of grammaticality. The next issue would be to understand if development of grammaticality motivates the development of fine-grained phonological characteristics or if these phenomena are simply concurrent. This issue is highly important because it could explain why children with SLI have so many problems developing their grammatical competence.

Children's creative uses of morpho-syntactic 'errors' between one and three: Variations and deviations

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Observers of child language have noted the recurrent « errors » produced by children between one and three, which have been referred to as « barbarisms » by Egger (1879) or « incorrect forms » by Buhler (1926). Most linguists now consider these 'errors' as revealing the process of early grammaticalization in children's speech, as in Clark's description of 'emergent categories' (2001). Children seem to construct their own transitory systems in the course of language acquisition.

In this paper, we examine the case of morpho-syntactic deviations, and view them as forming coherent, systematic transitory patterns where morphemes are given a different yet specific function by children.

The data used in the study are taken from three longitudinal follow-ups of French speaking children (Léonard, Théophile and Madeleine) aged one to three who are filmed at home with their parents once a month for an hour.

In our corpus, we find examples of marked and unmarked grammatical forms, which do not correspond to actual patterns in adult language. We first examine the absence of grammatical morphemes in the three children's speech at particular moments in the course of their linguistic development, in contexts where the adult linguistic form is necessarily marked, questioning the potential predictability of marked/unmarked forms in the children's linguistic productions.

In order to do so, we focus our analyses on

a) The uses of pre-nominal fillers versus bare nouns at 1;10 ("a ballon" versus "ballon");

b) Presence versus absence of prepositions between 1;10 and 2,02 ("café Martine" as opposed to "a café pour Martine" meaning "coffee for Martine");

c) asyndetic parataxis versus the use of the subordinator 'parce que' between 1;10 and 2;04 ("l'aime pas, vilain" meaning "don't like him, naughty" and "non, paque veux pas" meaning "no cos I don't want".

Our data shows that the use of marked and unmarked forms is irregular in terms of canonical syntax but not random, and corresponds to specific situations, and particular semantic/pragmatic features.

We then study the marked grammatical forms mentioned in b) and c) and noted that 'pour' and 'parce que' are used with unexpected and 'deviant' functions. We show that although they are irregular according to the semantics of French, there seems to be a creative and coherent pattern to the children's use of these morphemes within their transitory system. This regular pattern implies the selection of one of the semantic features of the morpheme excluding some others and enabling the child to attribute a specific pragmatic force to the marker.

What appear to be errors in children's productions actually form a coherent, albeit transitory system. Children's selection of the marked or unmarked forms, although they do not follow the adult rule, might not be considered as erratic: the non-canonical productions are not devoid of syntactic, semantic and pragmatic relevance. The same can be said about the deviant uses of prepositions and subordinators, which are not nonsense productions but seem to endorse specific pragmatic, discursive, or syntactic functions.

Symposium Session 10 - Friday 1 August 14.30 - 16.30
Symposium Number – S10-5

Chair: Ageliki Nicolopoulou, *Lehigh University*
Discussant: Kathy Hirsch-Pasek, *Temple University*

Narrative assessment of preschoolers: Significance and best practices

Description:
This symposium will focus on the assessment of preschool children's narrative skills, addressing both substantive and methodological issues. In recent decades there has been increasing attention to young children's narrative development by researchers in psychology, education, and speech pathology. This research interest has been motivated in part by convincing theoretical and empirical work arguing that children's mastery of early narrative skills during the preschool years offers important predictors and foundations for their later acquisition of literacy and for other dimensions of their overall educational success.

Nevertheless, this research is only beginning to provide a clear picture of the developing repertoires of young children's narrative skills, the interrelationships between them, and the factors and contexts that best promote their development. To delineate more precisely which dimensions of early narrative skills are most important in preparing the way for literacy and to explain the relevant developmental mechanisms more fully, one key requirement is to refine and strengthen our measures of young children's narrative competence. It is not clear whether the measures most commonly employed are able to capture young children's narrative skills in adequately comprehensive and discriminating ways, allowing us to delineate and systematically consider which dimensions of early narrative skills are most important and how they lay the foundations for later literacy. Our methodological tools must also allow for comparison across cases while being appropriately sensitive to both cultural and situational contexts.

The papers in this symposium will address these interconnected challenges. The first underlines the analytical and practical importance of oral narrative assessments in early childhood with an empirical analysis showing strong relationships between early oral narrative abilities and later reading abilities in three studies of 4- to 8-year-old children from diverse backgrounds (low-income US and middle-class New Zealand children). The next two papers explore the most effective and illuminating methods for assessing preschoolers' narrative competence. The second paper systematically compares US low-income preschoolers' narrations elicited under five different storytelling conditions (oral telling, picture sequence, single picture, personal narrative, or spontaneous story), and shows that no single technique is able to capture their skills fully or adequately. In a similar vein, the third paper, studying Turkish 3- to 5-year-olds, examines which storytelling techniques (oral vs. picture-supported) result in higher levels of comprehension, and then examines the developmental relationship between comprehension and production using the first technique. The fourth paper underscores the need for cultural sensitivity in constructing narrative assessments with a rich analysis of divergent narrative patterns in mother-child interactions in two different societies (US and Peru) and in two ethnic subcultures within the US (English- and Spanish-speaking), using two narrative techniques: retelling past events and sharing a wordless picture book.

Bringing together scholars from different countries (New Zealand, Peru, Turkey, and US) who incorporate a wide range of cultures in their research, while examining low-income and middle-class populations, this symposium tackles a number of methodological and theoretical issues that need to be seriously considered as we attempt to capture young children's narrative abilities and their larger significance for development and education.

Oral narrative skills and reading ability: Implications for assessment

Elaine Reese[1], Alison Sparks[2], Vrinda Kalia[2], Jennifer Long[1], Sebastian Suggate[1], Elizabeth Shaughency[1]
[1]University of Otago, [2]Clark University

Oral language skills are gaining recognition as an essential aspect of children's reading development (Dickinson et al., 2003; Whitehurst & Lonigan, 1998). Children with larger vocabularies learn to read more quickly, most likely because their semantic skills aid their efforts in decoding and understanding print (Whitehurst & Lonigan, 2001). Yet other aspects of oral language also appear to be important for reading. Oral narrative skills are hypothesized to be important for children's ability to comprehend written stories, and children's preschool storytelling skills predict their later reading comprehension skills (Dickinson & Tabors, 2001; Griffin, Hemphill, Camp, & Wolf, 2004). Other research has produced mixed evidence, however, on the importance of oral narrative skills for reading (e.g., Speece et al., 1999). We address the link between oral narrative and reading in three studies of 4- to 8-year-old children from diverse backgrounds. Children's oral narrative skill was measured in each sample using a story retelling procedure, in which an experimenter read an unfamiliar storybook to the child and then asked the child to retell the story (Reese, 1995). Children's narratives were scored for story memory (number of propositions recalled) and narrative quality (use of evaluative and orienting devices). Children's reading skills were measured via standardized measures of letter and word recognition at younger ages and oral reading fluency at older ages (Good & Kaminski, 2002). Children's vocabulary was measured as an oral language control variable in all studies with either the Peabody Picture Vocabulary Test (e.g., Dunn & Dunn, 1997) or the Expressive Vocabulary Test (Williams, 1997).

The first study focused on 50 low-income 4-year-old children attending Head Start. After controlling for age, maternal education, and expressive language, children's story memory was linked to their decoding skills ($pr = .29$, $p = .05$), and narrative quality was linked to story comprehension ($pr = .35$, $p < .05$). Thus, children with better oral narrative skills had better decoding and story comprehension skills.

The second study explored the link between oral narrative and decoding longitudinally with 50 middle-income children in New Zealand at ages 4;3 and 5;5. Children's early narrative quality predicted their later decoding ($pr = .65$, $p < .01$), but early decoding did not predict children's later narrative quality ($pr = .24$, n.s.), suggesting that early narrative skills might help later reading rather than vice-versa.

The third study was again longitudinal but with older NZ children (US grades 1-2). Children's narrative quality was correlated with their oral reading fluency concurrently ($pr = .54$, $p < .01$) and longitudinally ($pr = .48$, $p < .01$), controlling for their receptive vocabulary.

Across a range of samples, children's oral narrative skills uniquely predicted their concurrent and later reading skills. We propose that narrative skill is an independent contributor to children's ability to decode and to read, although we acknowledge that further research needs to be conducted to establish the causal role of oral narrative skill for early reading. We discuss these results with regard to the value of oral narrative assessments in early childhood and the early primary school years for a more complete picture of early literacy.

Multitasking: The best way to assess preschoolers' narrative competence?

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Over the past decades, evidence has been accumulating that early narrative competence is critical for the successful acquisition of literacy and later school success (Dickinson & Tabors, 2001; Griffin, Hempill, Camp, Wolf, 2004; Well, 1985). In addition, speech pathologists are recognizing that narrative is an important assessment tool of young children's complex language abilities (Johnston,

2006) as well as a good predictor of speech outcomes for specific language impaired children (Botting et al, 2001). These developments have brought about a need in creating a narrative assessment for young children. The question arises, however, which is the best way to assess young children's narrative abilities.

Though researchers have used a variety of methods to elicit narratives from children (oral, story supported by a sequence of pictures or a single picture, video, draw-and-tell), individual studies tend to use only one method. There are some studies that have attempted to compare various methods of story elicitation, but the results are inconclusive. Some provide evidence that the best method to assess narrative abilities is through spontaneous storytelling (Nurss & Hough, 1985; Spinillo & Pinto, 1994; Wellhousen, 1993), some through picture sequences (Cain & Oakhill, 1996; Klecan-Aker, McIngvale, & Swank, 1987), and others through recounting of personal events (Champion, 1997; Nelson, 1996). However, these studies suffer from several shortcomings: (1) the elicitation methods under consideration have not been systematically compared; (2) they have included different age ranges making any systematic comparison difficult; and (3) they have used different criteria in assessing children's narrative competence. The current study was designed to remedy this situation.

Method: Narratives from 51 low-income preschoolers (ages 3 and 4) were elicited under 5 storytelling conditions which differed in the amount of structure provided to children: (1) *oral* (high structure: told a story and then asked to retell *same* story); (2) *picture sequence* (medium structure: told a story with one picture sequence and then asked to tell a story with a *different* picture sequence); (3) *single picture* (low structure: told a story with a single picture and then asked to tell a story with a *different* single picture); (4) *personal narrative* (low structure: prompted with a model to tell a personal experience) and (5) *spontaneous narrative* (no structure: asked to tell any story they wished). Children's narrations were coded for length, narrative language, and narrative structure (orientation, problem, and resolution).

Results and Discussion: Four-year-olds told better stories than 3-year-olds on all conditions. And different storytelling conditions tapped different narrative competencies. Spontaneous stories were longer and richer in narrative language than those told in more structured conditions. Conversely, children displayed greater competence in connecting events in the picture sequence, and higher levels of problem inclusion in the two conditions with pictorial aids than in all other conditions. Overall, it seems that less structured conditions allow for more sophisticated narrative language whereas more structured conditions scaffold some aspects of narrative structure. These results strongly suggest that a complete assessment of preschoolers' narrative abilities should include a variety of story conditions and also use a range of narrative measures.

Effectiveness of different methods of narrative elicitation for assessment of comprehension and production

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In early childhood, children are exposed to different types of narrative experience; they are told or read stories with or without the aid of pictures. Though the extent of such experience varies, it has effects on children's listening comprehension and storytelling abilities by exemplifying the temporal-causal structure in terms of which events are organized in discourse (Bamberg, 1987; Berman & Slobin, 1994; Stein & Glenn, 1979; Trabasso, Secco, & van den Broek, 1984) and on their later literacy acquisition, by illustrating complex sentence structures and rich vocabulary (Hart & Risley, 1995). We are currently investigating the effectiveness of such experience for 3- to 5-year olds by comparing their comprehension and production of stories presented (i) orally, (ii) with the support of a sequence of pictures, and (iii) with the support of a single picture. The present study focuses on two questions: (1) which method of storytelling results in the highest level of comprehension at different ages, and (2) what is the nature of the developmental relation between comprehension and production when children have to rely on their listening comprehension – retelling skills?

Preliminary analyses comparing the three methodologies show that at all ages, highest level of comprehension is achieved with sequenced pictures and then with the oral story; the performance of 3-year olds is significantly different from that of 5-year olds. Comprehension of stories told with the support of a single picture is the lowest for 3- and 4-year olds who both differ significantly from 5's. Method does not appear to make a difference for the 5-year olds who perform as well on the single picture task. These findings indicate that the pictorial representation of the temporal-causal structure of the story aids younger children who have not yet formed a narrative schema, and who lack the memory skills for keeping in mind the major plot components.

Comparison of comprehension and production using the orally presented story analyzed according to Stein & Glenn's (1982) story grammar shows main effects of both task and age: 4- and 5-year olds display higher level of comprehension than production but the difference between the two tasks is not significant for 3-year olds. In this respect 3-year olds are different from both 4- year olds and 5-year olds. These findings show that cued recall yields a higher level of understanding of the temporal-causal structure of the story than reflected in retellings, in line with previous research (Goldman, 1985; Goldman & Varnhagen, 1986; Goldman, et al., 1999; Irlen, 2003). They also indicate that 3-year olds have not yet formed a stable story-schema to be captured by such a method.

Further analyses ask what plot components (orientation, complicating event/ action, and resolution) are included in children's retellings by age, and why: because they were stamped in memory when asked about in cued recall, or because are salient narrative components. Implications of the findings are discussed regarding the types of story telling / bookreading activities that should be supported for future literacy acquisition.

Narrative assessment and children's early literacy skills: Cultural and contextual considerations

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As educators and researchers focus on the importance of school readiness for future academic learning, narratives emerge as a compelling tool through which to assess children's literacy. Narrative is a form of extended discourse that requires children to move beyond the observable and create meaning solely through language. Children's early use of this type of discourse is a powerful predictor of future literacy skills because texts presented for comprehension in the school setting typically demand children to interpret complex messages without the support of a conversational partner or shared knowledge with an audience. Yet, cross-cultural work on narratives reminds us that classroom discourse privileges a culture-specific narrative style. Children whose home narrative interactions more closely resemble what occurs in the classroom tend to enjoy greater success in school than those whose daily interactions foster divergent narrative patterns. Thus, educators and researchers must find ways to evaluate children's narrative skills in culturally sensitive ways. The objective of our paper is two-fold: 1). Demonstrate cultural variations in narrative construction across two different assessment contexts and 2). Assess the relationship between these culture-specific narrative patterns and children's early literacy skills.

Method: Data were drawn from two related investigations of Spanish-speaking Latino, mothers and preschoolers (ages 3-5) narrative interactions. The first study included 64 monolingual middle-income mothers (32 Spanish-speaking and 32 English-speaking). Mother-child dyads were to engage in two tasks: (1) conversing about six past events experienced by the child, and (2) sharing a wordless picture book. The second study included 73 low-income mothers and their preschoolers and followed similar procedures, except that mothers engaged their children in the booksharing task only. Six months later, children's early literacy skills were assessed using print- and language-based constructs (e.g., concepts about print, independent narrative ability using another wordless book). All

narratives were audio taped, transcribed, and verified by native speakers of their respective languages. Mother and child language was coded for interactive discourse strategies (e.g., provision of information, request of information) and for narrative elements (e.g., events, descriptions).

Results and discussison: Taken together the two studies reveal the interchange between culture and context in narrative assessment and its relation to children's emergent literacy skills. In the first study, English-speaking mothers and children preferred to co-construct the narrative (i.e., shared the role of narrator) across both assessment contexts, whereas Spanish-speaking mothers and children shifted narrator responsibility across tasks. Specifically, Spanish-speaking mothers encouraged children to take greater control of the narrative in the personal narrative context but preferred to take control of the story during booksharing. Thus, children's narrative development is influenced by assessment context as well as culture. In the second study, similar patterns prevailed, and even more importantly, had differential predictive power over children's emergent literacy skills. Implications are discussed in relation to the significance of methodological decisions for conducting cross-cultural work and assessment practices of children from diverse backgrounds.

Poster Abstracts

P1-1

Suprasegmental features in babbling: Does early cochlear implantation enable deaf children to babble like hearing children do?

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Are the suprasegmental characteristics of prelexical babbles in deaf children with a cochlear implant (CI) similar to those of hearing children (NH)?

The suprasegmental characteristics of speech highly depend on auditory feedback, which guides the fine control of the voice. Since deaf children lack this auditory feedback system, their speech displays deviant suprasegmental features, already in the babbling stage. In this study we investigate suprasegmental features in the babbling of deaf children with a cochlear implant. These children received an implant at an early age: between 5 and 20 months.

We compared the suprasegmental features of spontaneous babbling productions of 10 CI children with those of 9 NH children. Bi-syllabic babbling productions were selected at the beginning of the babbling stage and at the end of the babbling stage.

For each babbled utterance (N = 611) and for each vowel (N = 1222) in the babbles, the following measures were taken: fundamental frequency, direction and degree of pitch change, and duration.

No differences were found in fundamental frequency, direction of pitch change or duration between the two groups of children.

We found differences in degree of pitch change between the two groups of children. NH children produce vowels with significantly stronger pitch variations than CI children at the end of the babbling period. While the degree of pitch change increases over age for the NH children, no changes over age were observed for the CI children. Neither cochlear implant experience nor age at implantation had any positive effects on the degree of pitch change.

These results indicate that early auditory exposure through a cochlear implant provides fundamental improvement already in prelexical babbling.

P1-2

The acquisition of pronominal relations in Dutch speaking cochlear implanted deaf children

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1. Research question

Does prelingual hearing impairment by default result in delayed syntactic acquisition? Or, can early cochlear implantation prevent such an acquisitional delay? We will address this question by investigating one particular case of syntax, i.e. pronominal relations.

2. Background

Relations between pronouns and their antecedents have received a lot of attention in studies on first language acquisition. Two pronominal relations can be distinguished from each other:

(1) a *reflexive* Mickey Mouse$_i$ kisses himself$_{i/*j}$.
b *non-reflexive* Mickey Mouse$_i$ is kissing him$_{*i/j}$.

In general, reflexive pronouns require their antecedent to be the local subject (*Mickey Mouse* in 1a*)* while non-reflexive pronouns ban this relation (1b). Many studies have claimed that the acquisition of non-reflexive pronominal relations lags behind in comparison with reflexives. This has been referred to as the *Pronoun Interpretation Problem* (PIP). Up to the age of nine, Dutch children allow non-reflexive pronouns to co-refer with a local antecedent in a non-adult like fashion: they interpret (1b) as a self-oriented action (*Mickey Mouse is kissing him$_{self}$*).

3. Aim

The aim of this study is to investigate the acquisition of pronominal relations, and especially the PIP, in two clinical groups of Dutch prelingually hearing-impaired children, i.e. children with cochlear implants (CI) and children with conventional hearing aids (HA). These two groups are compared with each other and with typically developing hearing children (TDH).

4. Hypothesis

By the age of seven, Dutch TDH children approach adult performance when tested on non-reflexive pronouns. It is hypothesized that CI children will outperform HA children. Moreover, we hypothesize that CI children are likely to acquire pronominal relations within the normal range.

5. Method

The analysis is based on a reaction time study of Dutch pronominal relations in two elicited comprehension tasks (picture selection and grammatical judgement) and two production tasks (picture description and narrative). All participants were respectively asked to select the matching picture to an auditory stimulus, to give a grammatical judgement to a matching picture and auditory stimulus, to describe a picture or to construct a narrative from a picture set. This study includes ten CI children implanted before two years of age, ten HA children and thirty TDH children. All 50 children were all tested between seven and eight years of age.

6. Results

The results of the comprehension tasks indicate that Dutch seven-year-old TDH children as well as early implanted CI children perform on adult level when tested on reflexive pronominal relations while HA children show a delayed acquisition. This confirms our hypothesis and thus corroborates previous studies. Many studies on early language development and some studies on general morpho-syntactic development have claimed that cochlear implantation provides a benefit for language acquisition. This means that although CI children receive an auditory reduced version of natural speech as compared to hearing peers, their speech input contains enough information for them to acquire language within the normal range. Cochlear implantation thus seems to stop the delaying influence of prelingual impairment on syntactic development.

P1-3

Extending the linguistic comprehension model to explain pre-lexical and lexical development in children with a cochlear implant

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In the course of recognizing words, listeners convert acoustic information in the speech signal into lexical representations. The Linguistic Comprehension model (LC) states that this conversion is performed by a system which contains three levels of representations - auditory, phonological, and lexical - and two levels of processing - perception and recognition. This linguistic model, based on Stochastic Optimality Theory (Boersma, 1998), is compatible with several psycholinguistic models that include a pre-lexical level of processing. It also unifies phonetic, phonological and psycholinguistic modeling of speech recognition and its acquisition. Currently, the model incorporates developmental proposals for both L1 and L2 acquisition. This poster focuses on how the model can be extended to L1 acquisition in special circumstances, as well as to acquisition in the manual-visual modality, i.e. sign language. In addition, we discuss how the model might be compatible with models of phonological short-term memory for speech and sign, e.g. the Working Memory model of Baddeley and colleagues. The predictions from the model are confronted with data from recognition and learning in word and sign by deaf children with a cochlear implant (CI).

The LC model predicts that CI children will have problems in perceiving and/or discriminating acoustic cues present in the speech signal, e.g. formant transitions, duration. These acoustic cues are necessary for the formation of auditory-phonetic and phonological categories. As a consequence, CI children will have difficulties in processing speech, i.e. mapping acoustic cues to perceptual representations and mapping the latter to lexical items. It can be hypothesized that these problems are even more pronounced in the case of learning novel words, i.e. establishing novel lexical representations. Given structural similarities between spoken and sign languages at the phonological and lexical level, both in representation and processing as well as acquisition, the LC model, can also be adapted to account for linguistic comprehension in the manual-visual modality. Specific visual cues such as extensions of the fingers, and movement and position of the hand in signing space are considered the building blocks of phonological representations (cf. Crasborn, 2001). Sign recognition therefore would rely on tracking, discriminating and integrating these cues and mapping these to phonological and lexical representations.

Experimental data obtained from a group of 16 CI children indicate that the model makes correct predictions. Results from several on-line and off-line tasks including auditory and visual cue discrimination, word and sign recognition and word and sign learning support the hypotheses. The extensions of the LC model in combination with the experimental results add validity to the model as an explanatory tool for language processing and acquisition in both typically and atypically developing populations.

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P1-4

Speech sound development in pediatric cochlear implant users who received implants before 29 months of age

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This study examined the articulation skills of 30 children who were born with bilateral, profound hearing loss and who received a cochlear implant (CI) before the age of 29 months. The assessment instrument used was the *Goldman-Fristoe Test of Articulation – second edition* (GFTA-2) (Goldman & Fristoe, 2000). Data from the first four years after CI use is presented. The goal of this study was to provide a comparison of the phoneme-acquisition patterns of prelingually deaf children who received CIs early in life with the phoneme-acquisition patterns of their hearing peers. Thus the study provides an index of consonant sounds acquired and an acquisition profile for consonant production in English-speaking children with CIs in the initial four years after cochlear implantation. Additionally, the acquisition profile provides educators and clinicians with a guide for programming and therapy. Results with regard to standardized test scores revealed that the average percentile rankings achieved on the GFTA-2 remained close to the 20th percentile across the time intervals of 24, 36 and 48 months post-CI. Similarly the average standard scores remained fairly stable (78, 75, 82) across time. The age-quotient however did rise slightly, from 53 to 61 between the 24 and 48 month post–CI use. The results provide insight as to how children with CIs compare with their hearing peers on overall consonant acquisition using a normative articulation measure. Additionally the theoretical implications of discrepant speech production development between CI users and NH users are discussed.

P1-5

The acquisition of morphosyntax in hearing-impaired children

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Background: Today, infants who are born profoundly deaf can access spoken language by means of a cochlear implant (CI), an electronic device that partially replaces the cochlear function via electrical stimulation of the auditory nerve. Implantation in very young children (< 12 months) can be performed safely, providing early access to auditory stimuli.

Questions: As the development of oral grammar is at least partially determined by exposure (Jusczyk 1992, Christophe e.a. 2003). The question raised in this study is whether in CI-children, the course of morphological development will be fundamentally different from their hearing peers with respect to the time-window in which it takes place (Curtiss 1977, Mayberry 1993) and with respect to the fixed order of acquisition of different morphemes (Brown 1973, Stromswold 1990). Early exposure to language (CI < 12months) is likely to yield overall age-appropriate morphological development. Yet, at the same time, even CI-children who have been implanted during the first year of life may deviate from the usual morphological development patterns (Coene e.a. 2007).

Method: Our study includes 94 Dutch-speaking hearing-impaired children between 4 and 7 years (44 children with classical hearing aids (HA) and 50 with a CI). A 50 utterances sample of spontaneous speech was analysed according to a standardized test for morpho-syntactic development (Van Dungen & Verbeek 1994). The morpho-syntactic variables of this test cover the verbal and nominal domain. Omissions and errors were counted in the use of main verbs, AUX, copula, AGR, PastPart, DETs and NPs.

Results: The results reveal that both HA-children and CI-children produce utterances that are shorter in length compared to typically developing hearing peers (MLU and MLU5 scores). Comparing the HA- and CI-children, the former show a significant delay (-2sd) on variables measuring morphological development while the latter perform within the normal range (0 to -1sd). For the CI-

population, a positive correlation is found between the children's age at implantation and the morphological variables assessed in this study (r=0.71 and 0.69 at the 4 and 6 years' evaluation respectively).

P1-6

Bilingual development in deaf children using cochlear implant

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This paper discusses bilingual development in Finnish Sign Language (FinSL) and Finnish in six deaf children using cochlear implant. These children were born to hearing parents who started to learn and use sign language with their children after the deafness was recognised. These parents also decided to have a cochlear implant (CI) for their children. The families attend a sign language program (Junior Program organised by The Service Foundation for the Deaf) where parents can learn sign language from deaf teachers, and deaf children with their hearing siblings attend activities (in sign language) arranged by deaf signing adults. The meeting are arranged 4 times per year: 3 weekend courses and 1 one-week course. The parents and the children are immersed in sign language during these meetings.

This abstract discusses the development of FinSL and Finnish in one child at the age of four and five. Her deafness was recognized at the age of 2;6. The parents started to familiarize themselves with sign language soon after that. The child got a CI at the age of 2;10. During the first recording for this research she was 4;5, and during the second recording 5;5. At the age of 4;5 she signed more than spoke, in general. She signed sentences in a more versatile manner with deaf signers than with her parents whose sign language was not fluent. In spoken Finnish she used separate words and short sentences, basic word forms with very few inflected forms. Her words were not correctly articulated, and many consonants were omitted. There were also babbling-like sequences. When she did not know a word she used a sign for it.

At the age of 5:5 the child was able to interact fairly well in sign language with deaf adults: when looking at picture books she knew how to move her eye gaze from the book to the interlocutor and back to the book so that she did not lose any information. She understood the signing of the adult deaf signer, and replied with separate signs and short utterances. When talking about a picture she picked out the names of objects in the picture but also used both frozen and depicting verbs. She used the signing space to some extend to express grammatical relations. As to spoken Finnish, she understood what the interlocutor was saying, and she used separate words and short sentences. Sometimes the predicate (mostly copula) was missing in the sentence. Sometimes the word order was more like in a signed utterance. The idea of 3. person inflection of verbs and inflection of object forms of nouns were both evident. The child had learnt fairly well to whom she has to speak and to whom she needed to sign. At this age she used more spoken Finnish than FinSL, in general, but both of the languages had clearly developed during the one year period.

The final paper will discuss the development of all the six children and show the individual differences of the development in each language. The preliminary results show that several matters effect on the developmental course of the languages in these children: the age of diagnosis of the hearing loss, the age at which sign language begins to be used with the children, the amount of sign language used at home and otherwise in the surroundings of the child, the age of starting to use the CI, the child's ability to benefit from the CI, and their knowledge of sign language before getting benefit from the CI. So the language questions must be handled individually, but in every case both support for language development before reaching pre-school age instruction at school should be available in both languages.

P1-7

Language development and gestures in Mexican Spanish speaking children

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The present study was designed to determine the relationship between language and cognition in the first stages of development in children whose mothers have different educational levels. Language comprehension and gesture use have been shown to be important predictors of early language development in multiple studies (Acredolo & Goodwyn, 1988; Thal & Tobias, 1992; Rescorla, 1984; Goldin-Meadow & Morford, 1990; Iverson, Capirsi, Caselli, 1994; Capirsi, Iverson, Pizzuto, & Volterra, 1996). Language and gestures were analyzed to establish linear developmental trends. Most studies based on the relationship between language and cognition in English and Italian has examined only middle class children. The use of parental report instruments has been particularly useful in obtaining information about language comprehension and production and gesture use. However, little work has been done using parental report in lower income families and within Spanish-speaking communities. This study addresses the early language acquisition in Mexican Spanish-speaking lower SES and middle class children using the Inventario de Desarrollo de Habilidades Comunicativas (IDHC) and Spontaneous Language Sample (SLS) from 64 ten and twelve-month-old Spanish children.

The children were compared by the educational level of their mothers. Trend analyses showed statiscally significant linear trends across educational levels for vocabulary comprehension and production. The trend for gestures was not significant. The relationship between language and nonverbal cognition was concurrent. These findings coincide with studies in other languages. It is important to note that no significant differences were found across comparative data for vocabulary comprehension, production, and gestures due to maternal educational level. Therefore, the results from maternal report and experimental tasks of linguistic and nonverbal components in early stages suggest there are no effects of maternal educational level. The relationship of maternal education and other socio-demographic variables and measures of children's language should be examined before using such measures. The effectiveness of parental report in both socio-economic groups is also discussed.

P1-8

The role of sign language skills in learning to read and write by Deaf bilingual children: Evidence from French Sign Language data

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In European French-speaking countries, there is a strong assumption among teachers, researchers and policy makers that students have to master oral French before being able to learn to read and write in French. This assumption is even wildly spread among professionals working in the deaf education field (Leybaert, 2000). Consequently, oral French plays a major role in the education of deaf children. Even when French Sign Language (LSF) is part of the curriculum (LSF-French bilingual programs), French is generally taught not only in its written form but also in its oral form (Tuller, Blondel & Niederberger, 2007).

During the past decade a few studies have demonstrated that the linguistic skills developed in any language, even in a sign language, can have a positive impact on the acquisition of literacy skills. Although most of the data was collected on deaf students in North America and focused on the role of ASL skills in English literacy skills acquisition (Hoffmeister, 2000; Chamberlain & Mayberry, 2000; Padden & Ramsey, 2000; Prinz & Strong 1998), similar observations are now made in an increasing number of countries, for instance in Québec/Canada for LSQ and French (Dubuisson, Parisot & Vercaigne-Ménard, forthcoming), in New-Zealand for NZSL and English (Biederman, 2003) and in Switzerland for LSF/French (the author's publications).

These findings should have a strong impact at a theoretical level on models of literacy acquisition and at a practical level on deaf education policy since they demonstrate that the mastery of an oral language is not necessary to become literate.

In previous publications, analyses of the Swiss data revealed that out of 39 deaf students, born to hearing parents, ages 8-17, the top third in French reading and writing also performed among the best on oral French comprehension tasks, and/or on LSF production/comprehension tasks. Those results were interpreted as an evidence of different possible paths toward literacy (LSF-based vs. oral French-based).

In this poster, a more in-depth qualitative analysis of the student profiles will be presented in an attempt to describe how sign language skills can support the acquisition of reading and writing. The responses of three subgroups of strong readers (LSF+oral+; LSF+oral-; LSF-oral+) on a battery of language tasks (including the production and the comprehension of narratives and sentences completion tasks) will be compared in order to highlight similarities and differences in the students learning process. Results show that the participants with strong LSF skills develop good written French skills particularly at the narrative level (narrative structure, cohesion) and for all visual aspects of the language (word spelling, punctuation).

P1-9

Gestural or linguistic pointing? Developmental issues in sign linguistics

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The use of deixis is a basic ingredient of all languages although its uses may differ in form. Deixis is expressed in gesturing, in signing, and in speaking. Developmentally, it is well known that the younger the user, the more likely the use of the index finger for deictic and other functions of pointing. In the auditory-acoustic modality, i.e. all spoken languages, pointing partly branches off into the use of deictic words, with and without pointing. In sign languages this branching off takes place as well, however the process is much less evident, since gestural and linguistic signals both share the same visual-manual modality. How does the developmental researcher in sign language linguistics decide on a gestural versus a linguistic status of pointing in 2-3 year old deaf children? Based on research with 30 deaf children in this age range, we found quantitative and qualitative differences in comparing pointing behavior of children whose parents are deaf (DD) or hearing (DH). Although all toddlers point a lot, DD children point about five times more frequently than DH. Most significantly, from early stages on, DD pointing differs qualitatively from DH pointing. Considering both the forms and functions of early points, DD children demonstrate types of "complex pointing" that behave like lexical signs, using some of the same types of modulations that are part of the grammar of signs. Points incorporate gradient markers of size, rate, emphasis, and extension, and they begin to remain within signing space. That is, DD children begin to "dwarf" their signs in the construction of linguistic signing space, while treating them in similar fashion to lexical signs. Points are also integrated into utterances that include signs, thus serving as a visual bridge between a linguistic symbol and its referent entity or situation. It is hypothisized that one of the functions of complex points is to help the child to navigate the signing space in close coordination with eye gaze allocation. Form-function analysis of such points shows crucial developmental changes in gaze management and referent integration. Exploring the forms and functions of signing and pointing may bring us closer to questions concerning the differences of gestural and signed points in the acquisition of sign languages.

P1-10

Two sources for ASL-English mixing by young bimodal bilinguals

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This poster investigates two categories of bimodal mixed structures produced by two hearing male children, aged 2;6 and 3;6, simultaneously acquiring spoken English and American Sign Language (ASL) from families with one Deaf and one hearing parent. Applying the Hulk and Müller (2000) proposal (henceforth H&M) for crosslinguistic transfer, we find that one category of our simultaneous mixes is amenable to a H&M analysis, but the other is not. We propose that the latter are best categorized not as transfer of English into ASL or vice versa, but rather examples of the young bilinguals' developing conception of contact sign, a mixed system unique to bimodal language use.

H&M hypothesize that cross-linguistic mixing will occur at the interface between two modules of the grammar, particularly at the syntax-pragmatics interface involving the CP projection. In addition, transfer is predicted to occur when the input leads the child to hypothesize (correctly or incorrectly) that both her languages allow the structure in question. We applied these criteria to two types of simultaneous ASL and English mixes produced by two hearing ASL/English bilingual boys during 90-120 minutes of natural play with a parent. The first type of potential transfer structures are characterized by of subject and/or object omission, as in (1).

(1) DON'T-WANT WATER. OTHER
Don't want water. Want other one.

These are clearly discourse constructions, involving the syntax-pragmatics interface. The input also provides plausible evidence for the child that argument omission is permitted in both ASL and English. Following H&M, we assume that ASL-English bilinguals misinterpret the empty object position resulting from grammatical object topicalization in English as evidence that this language, like ASL, allows omission of previously established topics. Evidence for dropped subjects may come from subjectless sentences common in colloquial English (eg. *Oops, almost forgot my keys!*). Thus, this category of ASL/English mixes appear to be transfer errors motivated by the same mechanisms underlying more familiar transfer between two spoken languages.

Our second category of mixes involves null wh-question and negative structures, marked with ASL nonmanuals. In English, such omissions are ungrammatical, while in ASL, they are licensed by the obligatory nonmanual markers.

(2) _____wh
SAY
you say?
'What did you say?'

(3) _____neg
DON'T-KNOW HOW
know how
'You don't know how (to do it)'

Questions (though not negation) may qualify as interface structures of the type required by H&M, but we could not identify any English structure (eg. intonation patterns that licensing null wh-questions or negatives) that might lead children to hypothesize that such

omission is permitted in English. As argued in Quinn (2004), we suggest that the etiology of these "errors" lies elsewhere, in the bimodal bilingual's conception of contact sign, a "third system" found in sign-speech environments where both ASL and English are subject to cross-linguistic transfer targeting various levels of the grammar (Lucas & Valli 1992; Romaine 1995). These findings, though preliminary, point to the value of testing theories of bilingual acquisition with bimodal data, which sometimes offer mixes not observed in traditional spoken-spoken bilingualism.

P1-11

Error patterns in vocabulary choices in deaf students: A response analysis of synonyms and antonyms in American Sign Language

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This study investigated the acquisition of metalinguistic judgments through synonym and antonym vocabulary in American Sign Language (ASL). Over 300 Deaf children from 4 to 19 years of age from two distinct language backgrounds: those with Deaf parents (DCDP) who had been exposed to ASL from birth and those with hearing parents (DCHP) who had a range of ASL exposure and experience before attending school. Data was collected using the American Sign Language Assessment Instrument (ASLAI) Synonym and Antonym subtests which are receptive, multiple-choice assessments. Subjects were shown a video of an ASL lexical item followed by three foils and a correct response. Subjects were asked to select the item that was related through synonymy or antonymy. Foil types were categorized linguistically, for example, phonological or semantic errors and subjects' error selection was examined to find patterns across sub-groupings, such as by age and parental hearing status. While some evidence of error typing did occur, the more significant differences between groupings were based on the number of errors made. The Deaf children with Deaf parents consistently outperformed the Deaf children with hearing parents, even when the younger DCDP group was compared to the older DCHP group. The results support the literature, which suggest that early exposure to language models is crucial in order to develop linguistic sophistication, metalinguistic skills, and advanced vocabulary knowledge.

P1-12

Comparing bimodal and monomodal ASL phonological development: The development of hand configuration and location in early signs of a hearing coda child

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Most studies of signed language acquisition have focused on deaf children who are raised by signing deaf parents. These studies do not typically include hearing children of deaf parents, who are bilinguals acquiring both a signed language and a spoken language. From studies of bilingual acquisition of two spoken languages, we know that a bilingual child's development of one of the two languages does not necessarily parallel monolingual acquisition of that language. We assume the same is true of American Sign Language (ASL) and bimodal bilinguals (e.g., hearing children of deaf adults or hearing codas), but the lack of research in this area means that we do not yet understand how bimodal ASL development differs from monolingual ASL development. In this case study, I take the claims of Boyes Braem (1990) and Conlin et al (2000), which focused on monomodal language acquisition in signing deaf children, and test them with acquisition data from a bimodal bilingual (or hearing coda) child. I look at the acquisition of hand configuration and location in ASL by a hearing coda child (codenamed BEN) over the period of a year, from the age of 1;4 to 2;5.

According to Boyes Braem (1990), the earliest set of hand configurations acquired are unmarked, e.g., A, S, 1, 5, C. Furthermore, it is predicted that in the signs with more complex hand configurations, substitutions of unmarked hand configurations will occur. Conlin et al (2000) found that hand configuration errors are more frequent than those of location errors in the phonological development of early signs.

From a corpus of over 100 signs, I analyzed the features of hand configuration and location for each sign, comparing the actual production against the target sign (i.e., the form that an adult native ASL user would produce). Analysis of the data reveals findings similar to that of Conlin et al (2000). Furthermore, as predicted by Boyes Braem (1990), where errors with hand configuration occurred, substitutions were typically of unmarked handshapes, i.e., signing TRUCK (target handshape: T) with the unmarked S-handshape. A few counterexamples exist in the data, e.g., using the marked open-8 handshape for PLANE, which typically has the target handshape Y which is less marked.

While this case study gives insight on the question as to whether bimodal ASL development parallels monolingual ASL development, the data is still limited. Further analysis will tell us to what degree ASL phonological development of bimodal bilinguals resembles that of monolinguals, but preliminary analysis indicates that the same broad patterns of substitution reported for monomodal speakers apply to bimodal speakers.

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P1-13

Circular motion gestures can help young children learn part names of objects

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Learning part names is difficult because young children tend to assume a given word refers to the whole object. Some linguistic cues such as mutual exclusivity (Markman & Watchtel, 1988) and whole-part juxtaposition (Saylor & Sabbagh, 2004) and some non-linguistic, pragmatic cues (Moll, Koring, Carpenter, & Tomasello, 2006) have been demonstrated to help young children, but whether children use gestures such as pointing in learning part names is not well known. Kobayashi showed that in teaching part names, adults moving object parts or simply touching object parts can be effective for young children (Kobayashi, 1998; 2002). In this study, we examined the effect of two kinds of adults' finger movements, touching and making a circular motion in teaching part names.

Participants were thirty-one Japanese 2-year-olds, thirty 4-year-olds, and thirty-one adults. There were four object sets. In one set, a training object was a U-shaped bolt, and test choices were a nut (part choice) and a U-shaped bolt (whole choice). There were

two conditions of a part test and a transfer test. In the training phase, there were 2x2 different conditions of touching and circular motions. The experimenter either touched or did not touch the crucial part, keeping the finger with a distance of 7cm above the part, and she either moved her forefinger around the crucial part with a circular motion for 2 seconds or did not. In the test phase, the participant was asked to point to the item that could be called by the part name. For adults, part names were replaced by nonsense syllables and they were asked to think these were foreign words.

The number of part choices by each participant in the part condition were taken, and a 2 (touching) x 2 (circular motion) x 3 (age) ANOVA was computed. All main effects were significant. A significant Touching x Circular Motion was detected ($F(1,91)=5.737$, $p<.05$, suggesting the effect of touching was more evident when it was accompanied by a circular motion. A significant Touching x Age interaction was also detected, (2,182)=13.105, $p<.0001$. Further analyses revealed that the number of part responses was low among all age groups in the no-touch condition, but it increased with age in the touch condition. Finally, a significant Circular Motion x Age interaction was also detected, $F(2,182)=6.351$, $p<.01$. Further analyses revealed that simple pointing was not effective for 2-year-olds (M=0.85) comparing with 4-year-olds ($M=2.467$) and adults (M=3.286) but they did as well as 4-year-olds and adults in the circular motion condition ($M=3.0$). Similar results were found in the transfer task.

The circular motion of adults' finger movements was effective for teaching part names and the effect was more evident if it was accompanied by touching. In this condition, even 2-year-olds who otherwise did not learn part names were able to learn them as well as 4-year-olds and adult. Thus, it was shown that subtle non-linguistic cues such as touching the part or not, or the touching with a circular motion or not can be very informative for young children to learn part names, suggesting that young children are sensitive to adult gestures in learning words.

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P1-14

Children's use of gesture to resolve lexical ambiguity

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Previous research on children's acquisition of lexically ambiguous terms has suggested that they have difficulty making one-to-many word-to-meaning mappings. For instance, children have not been shown to accept the multiple meanings of homonyms until 4-years, and appear not to be aware that the ambiguity exists until around age 6-years. A problem with previous studies is that they have required children to make explicit judgements in quite artificial experimental settings. We report on a study investigating 3 – 5-year-old children's use of gesture to disambiguate homonym senses. Children's implicit knowledge is often revealed through gesture (e.g., Goldin-Meadow, 2000); therefore our study aimed to examine children's knowledge of lexical ambiguity through both the verbal and non-verbal channels. Children were told three short stories from specially made storybooks. Each story contained two homonym senses; for example, one story involved a *bat* (flying mammal) and a *bat* (sports equipment). The children were then asked to re-tell these stories to a second experimenter using the storybook as an aid. However, there was a barrier between the child and the experimenter, so that the experimenter could not see the storybook. The data were coded for whether children (i) disambiguated the two senses, and (ii) used gesture during their attempts at disambiguation. The results indicated that the 3-year-old children rarely disambiguated the two senses, mainly using deictic pointing gestures during attempts at disambiguation. This was an inappropriate response, since the listener could not see the storybooks that the children were narrating. In contrast, the 4-year-old children disambiguated the two senses more often, doing using a large proportion of iconic gestures. The 5-year-old children used significantly less iconic gestures than the 4-year-olds, but unlike the 3-year-olds, were able to disambiguate the senses through the verbal channel. The results therefore suggest a gradual development of sensitivity to lexical ambiguity, which is first revealed through gesture. The results highlight the value of gesture to the development of children's communication skills.

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P1-15

Iconic gesture cues facilitate lexical-semantic learning for naming and extension of object labels

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The purpose of the current work was two-fold, to examine the effect of semantic representation on lexical retrieval for naming and word extension, and to examine the efficacy of iconic gestures as a semantic enrichment cue. Word learning grossly encompasses a semantic and a lexical representation. Lexeme retrieval for naming is influenced by the richness of the semantic representation of that word. The more a child knows about a referent the more likely he will retrieve that referent's lexeme to name it. Weaker representations may result in semantic naming errors because they are not distinct from other words and there are fewer connections to the lexeme in memory. Words that are recently learned (fast mapped) or infrequently encountered have weaker representations than more frequently or richly experienced words (slow mapped). For example, in Capone & McGregor (2005) toddlers had more semantic knowledge and named more trained words under semantic enrichment conditions than under a no enrichment condition. They provided semantic enrichment via iconic gesture cues. Iconic gestures are hand/body movements that convey semantic information about a referent. However, naming is just one measure of word learning, and there was not a stringent test that any gesture, not necessarily semantic, would serve as a memory cue. Therefore, the current experiments included another measure of word learning, word extension, and included a non-semantic gesture condition for comparison. Extension refers to the child's ability to generalize a known word to a novel exemplar. Extension paradigms are often used to measure a child's ability to form categories during the fast mapping interval. The child has the known object in view and makes a recognition choice from exemplars that vary by one feature. The influence of the representational richness on word extension after slow mapping is unexplored. The current study further explored iconic gestures as an enrichment cue by comparing them to a no gesture condition and a pointing gesture condition in two separate experiments. The hypothesis was that iconic gesture cues facilitate lexical retrieval for naming and extension because these gestures enrich semantic learning over no gesture input or just pointing to the object. The alternative hypothesis was that iconic gestures, like pointing gestures, serve only to enhance attention to the referent.

Typically developing toddlers, ages 27- to 42-months, participated in a brief course of novel lexeme-referent training. Lexical factors were controlled between conditions and gesture cues were manipulated. In two experiments, a shape gesture highlighted the object's shape when it was labelled (Shape condition) and a function gesture highlighted its function (Function condition). In Experiment 1 the iconic gesture conditions were compared to a No Gesture condition and in Experiment 2 they were compared to a Pointing condition. Toddlers had exposure to the extension exemplar objects but these were never labelled with lexemes or gestures. Word learning was then assessed across semantic and lexical retrieval tasks: (1) object identification after the first exposure (fast mapping), and (2) labelling of object function, (3) naming of trained referents and (4) extension tasks (naming or recognition of novel exemplars), after 3 learning exposures (slow mapping). Initial results support the hypothesis that iconic gesture cues strengthen lexical-semantic learning. Naming of trained objects and extension to novel exemplars occurred more often in the Shape and Function conditions than the No Gesture and Pointing conditions. Results will be discussed within an associationistic model of the lexical-semantic system, and in terms of how gestured input functions to improve word learning within this distributed view of the lexical-semantic system.

P1-16

The notions of L2 learners of Catalan on the links between speech and writing

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In order to become literate children must learn, *interalia,* the way in which a particular writing system represents a language. Studies on early literacy in different languages found that it is only after formal instruction that children look for every spoken word to be written down. These studies focused on children who were learning a WS that represented their L1, but the extent to which intuitions developed for the first-learned writing system (WS1) will be transferable to other writing systems (WS2s) has not been thoroughly explored. We aimed at tracing early literacy conceptions of children acquiring an L2, together with its writing system (WS2).

Sixty 5 to 8 year-olds from Morocco, Southern China and Latin-America –20 per language group—, and a group of 20 Catalan controls participated in the study. All children in the target groups have been living in Catalonia (Spain) and attending Catalan schools for about 18 months. However, the L1s of the Moroccan and the Chinese differ typologically from the L2 (Catalan), whereas the L1 of Latin-American children does not. Moreover, both in Morocco and China the spoken L1 (*Dariya* and *Qina tian hua*, respectively) is not written, and the written language in either country does not represent the spoken L1. Neither Latin-American nor Catalan children were in such a diglossic situation. Typological differences and the contrasting relationship between spoken and written language among the three target groups motivated the design of this study.

Children participated in a set of semi-structured tasks to assess their comprehension and production of changes in number within an indefinite DP (from singular to plural and from plural to singular), and in locative derivatives (form base to derivative, and from derivative to base). Children's oral and written productions for representing inflectional and derivational changes were evaluated. Afterwards, all the mismatches between modified/unmodified spoken utterances and modified/unmodified written productions were computed. L1-related effects and developmental changes were particularly considered.

Results show that Moroccan and Chinese children produced less oral and written modifications than Latin-American children and controls for representing inflectional and derivational changes. Moreover, in all language groups older children produced more modifications in both oral and written productions than their younger counterparts. Finally, Chinese and Moroccan kids were far more reluctant than Latin-American children and controls to reflect in writing changes that they themselves had orally produced. These data suggest that Moroccan and Chinese children accept that changes in spoken utterances do not have to be reflected in writing. Differences with the Latin-American group indicate that notions about the links between language and writing, as forged in a diglossic context, clearly affect the learning and performance in a WS2 that relates to language in a different manner.

P1-17

Discrete naming speed, serial naming speed and literacy in children with word finding difficulties

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Children with language and literacy disabilities have significant impairments in their speed of naming. In studies of children with language difficulties, discrete naming speed (naming pictures one at a time) has been the most commonly used measure; while in studies of children with dyslexia, serial naming speed (naming a series of pictures in a sequence) has been the most commonly used measure. It is rare for both measures to be used together; consequently, there are uncertainties about whether these two forms of naming involve the same cognitive operations. This is the first issue we address.

The second issue concerns the claim by Wolf & Bowers (1999) in their Double Deficit model of dyslexia that there are two major influences on literacy, naming speed which is an influence on reading comprehension but not to decoding, and phonological awareness which is related to decoding but not to reading comprehension.

Methods: Children (mean age of 7; 2) were recruited who had scores on the Test of Word Finding (German, 1989) of less than 85 and non-verbal abilities within the typical range (Dockrell & Messer, 2007). Their phonological awareness (Frederickson et al., 1997) also was assessed at this age. Discrete picture naming and serial picture naming (based on Rapid Automatized Naming Tasks) were assessed in 18 children at 8; 6 years, together with decoding (BAS II Word Reading Scale; Elliott, 1997) and reading comprehension (WORD Passage Comprehension Tests; Woodcock, 1998).

Results: The children with WFDs were very slow at serial naming in comparison with chronological age equivalents (Meyer et al. 1998). Furthermore, there were few significant correlations between serial and discrete naming.

Serial naming speed but not discrete naming was highly correlated with reading comprehension as predicted in the double deficit model. However, contrary to predictions, serial naming speed also was highly correlated with decoding. A regression analysis revealed that serial naming speed was a significant independent predictor of both decoding and reading comprehension.

Conclusions: The absence of high and significant correlations between discrete and serial naming suggests that these two processes involve different cognitive operations. Thus, it should not be assumed that the two tasks assess the same set of abilities. This may be because discrete naming involves greater cognitive demands as children must both identify and access a new target item for every target. In contrast serial naming tasks provide a greater degree of predictability as children rehearse the items prior to beginning the timed task.

The findings also present challenges to the Double Deficit model of Wolf & Bowers (1999). As predicted serial naming speed was related to reading comprehension, however, contrary to the predictions derived from the model serial naming speed also predicted decoding ability and was a better predictor of this than phonological awareness. Reasons for these findings are discussed.

P1-18

Deviant over regularization patterns in verbal morphology in Dutch children at risk for dyslexia

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Dyslexia is popularly viewed as a phonological awareness deficit affecting reading skills of school-aged children. Longitudinal studies in English, Finnish and Dutch are now beginning to provide a more complex profile of *deviant language acquisition* in children at genetic risk for dyslexia.

Concerning verb acquisition, the Dutch longitudinal study (over 300 at-risk and control children) shows that already at 17 months, at-risk children display reduced proportions of verbs in their productive lexicons, as is administered via parental reports using the MacArthur-Bates Communicative Development Inventory.

For the development of verb morphology, the production of past particles and past tenses is studied between the ages of 2 and 6 years, using two successive parental reports (N-CDI, KINT) and elicited production experiments. Analyses of irregular verb forms yield significant group differences, both in amount of forms and in developmental pattern. Between the ages of 23 months and 59 months, at-risk children produce fewer irregular verb forms, whether the forms are correct irregular (e.g. *broke*) or incorrect over-regularized forms (e.g. *breaked*), and show a flatter developmental curve. By contrast, control children demonstrate a U-shaped development for past participles (from 29 months) and past tenses (from 41 months) – first mainly correct forms, then increased incorrect over-regularized forms and finally an explosion of correct forms.

It is assumed that control children actively identify (sub) regularities of verb inflection in the input and generalize over morphological patterns. At-risk children, however, seem to be at a disadvantage when it comes to discovering morphological (sub) regularities, as is suggested by their late start and lower levels of over-regularizations. This disadvantage could be explained by their impaired auditory processing of speech sounds, which was discovered in ERP-experiments with the same at-risk children starting at 2 months of age. This auditory processing impairment is presumably affecting their phonological skills which are, in turn, indispensable for detecting specific morpho-phonological features of the Dutch verbal paradigm.

The results, new for Dutch, are interpreted as supporting Joanisse et al. (2000), who found older English dyslexic children to have problems with regular past tense production, suggesting instable phonological inflectional rule representations. However, interpretation of our results in the light of a dual mechanism model (Pinker & Prince, 1994), may lead to new insights both for *acquisition* of morphological rules and *storage and retrieval* of irregular verb forms by children at-risk for dyslexia. It is hypothesized that, after (late) acquisition of the Dutch verbal paradigm, at-risk children also suffer longer from delayed retrieval of stored irregular forms, as a typical reflex of dyslexia. In a dual mechanism model, delayed retrieval of stored forms results in over-generation of regular forms by over-application of standard morphological rules, which predicts relatively late over-regularization errors in at-risk children.

Ongoing investigations with the Dutch at-risk children, now 5-6 years old, and their dyslexic parents, concern elicited production experiments with irregular and novel verb forms. Results show evidence for a specific combination of continued instable morpho-phonological rule representations and word retrieval problems that are discussed in perspective of the earlier atypical developmental patterns.

P1-19

Atypical lateralization in auditory regions of dyslexic children: Is there a reduced right hemispheric contribution to temporal integration and segmentation?

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Developmental dyslexia is associated with problems in auditory perception and processing of speech sounds. In particular, it has been suggested that degraded auditory representations may give rise to deficits in temporal processing and – as we suggest here – to deficits in temporal integration. For speech perception, the segmentation of the auditory stream into discrete representations is a prerequisite. This will produce neural activity with corresponding frequency content, i.e. with wave lengths in the range of several hundred milliseconds. Consequently, we mapped focal slow waves in both the delta (1.5-4Hz) and theta (4-8 HZ) frequency band, using a magnetoencephalographic (MEG-based) source imaging in a sample of 48 dyslexic and 20 normal readers (aged 8.2 -11.4), while processing phonemes presented in a passive auditory odd-ball paradigm. A group difference in hemispheric asymmetry in the density of magnetic slow waves appeared in the perisylvian regions, whereby dyslexic children showed less delta activity in the right hemisphere as compared to controls. Our results add to a substantial literature of deviant hemispheric asymmetry in dyslexic children but unprecedentedly suggest impaired right hemispheric contribution to the segmentation process of speech sounds in dyslexia.

P1-20

Phonological skills are clinically stable markers for dyslexia

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Aim: In a study of 485 German-speaking pupils, being referred to our clinic due to a suspected learning disorder, primarily dyslexia (88%), we tested multiple skills reported to be causal or correlative to dyslexia, i.e. phonological deficits, comorbidities (e.g. ADHD), motor deficits, or socio-economic status, and we tried to replicate numbers on prevalence or secondary symptoms.

Methods: Since we only diagnosed 7.4% for dyslexia (merely 5.2% compared to their performance IQ) by means of the discrepancy criterion of the ICD-10 we defined three groups: IRW being clinically impaired in reading and/or writing (RW) according to ICD-10 standards (n=118), PRW being poor in RW, but not realizing a >1.5 SD discrepancy of IQ-predicted RW skills (n=157), and NRW, reaching normal RW level (n=126). 84 kids were excluded from this study due to incomplete profiles. Among other tests we conducted examinations of rapid automatized naming (RAN) skills, phonological short-term memory (STM), phonological awareness, phonological discrimination, and dichotic listening.

Results: IRW were highly significant poorer in RAN and a word and pseudo-word onset deletion task, and poorer on a 5% significance level in STM/phonological memory accuracy and sound synthesis tasks, when compared to NRW. PRW and NRW were significantly dissimilar in all tasks excepting dichotic listening and word onset discrimination. Searching for differentiating features of IRW and PRW, facing equal skills in RW accuracy and time, we calculated nonparametric correlations. All tasks pertaining to phonological loop or rapid access to phonological quality correlated more highly within the IRW group. Overall, RAN correlated moderately with reading time, and, showing its intrinsic phonological nature, correlated r=.50 with phonological discrimination of words dissimilar in their onsets' voicing. Low to moderate correlations of r=.31 were shown between onset deletion tasks and RW accuracy, whereas the 'classic' tasks of phonological awareness (sound identification, synthesis, deletion) correlated around .44 with STM, but

there were no age effects. In a regressional analysis only the factors onset deletion and RAN added to the explanation of variance in addition to verbal IQ, familiar prevalence of dyslexia, and age.

Conclusions: In a comprehensive battery of RW-related tasks only skills pertaining to exact phonological representations showed significant correlations with RW impairment. This supports a view of dyslexia as being caused by subtle language deficits.

The ICD-10 definition underestimates the quantity of individuals with RW problems, taking into account that nearly 50% of our subjects attended preschool, around 40% received speech and language therapy, and more than 50% had to repeat a class. Although 31.8% had impaired RW, another 32.4% scored ≤ 10th percentile, but their RW skills weren't more than 1.5 SD below their total IQ (86.8). In our sample, the intelligence-discrepancy definition results in a .65 correlation of total IQ to IQ level and age level RW skills ($p > .001$). The definition undermines the notion of dyslexia as genetically programmed circumscribed disorder with clinically stable phonological markers and discourages the search for (singular) causes and specific remediation of dyslexia.

P1-21

Dyslexia – An audiovisual speech processing deficit? Evidence from three eye tracking studies

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It is widely believed that a phonological deficit is the underlying cause for developmental dyslexia. Other linguistic features such as order threshold in categorial perception have been tested in dyslexic subjects yielding results that range from unimpaired to conspicuous values. In three experiments more than 35 dyslexic subjects were tested in an eyetracking setting where the focus was on subjects' abilities to respond to stimuli involving acoustic as well as visual information. The first study shows that dyslexic subjects do not seem to be susceptible to the McGurk illusion in the way that matched controls are. The McGurk effect is known to elicit subject responses of the perception of the syllable [da] when a visual [ga] is acoustically dubbed with an acoustic [ba]. With our dyslexic subjects this illusion did not work within a significant sample, eliciting only the audible [ba] syllable and never the visual [ga] or the illusory [da]. Eyetracking data reveal that the facial areas relevant for speechreading were in fact fixated by subjects but seemingly no information from the visual input was processed and the illusory [da] effect did not occur. Results from this study led to the second experiment in which subjects' abilities to procure meaning from a talking face was tested while masking noise blurred the acoustic signal. In this setting subjects were confronted with a talking face producing sentences like "The young man buys an expensive green car". Subjects received semantic help via the presentation of symbols next to the talking face (for instance a man, bills of money and a car). By looking at these symbols the content of the sentence could be inferred. However, the sentences could not be repeated correctly without the help of speechreading from the talking face. Results from this second study reveal that dyslexic subjects seem to obtain no useful information from the visual speech input, even when eyetracking data shows that the relevant areas were fixated. In another eyetracking experiment dyslexic subjects' ability to interpret stimuli that involved congruent and incongruent audiovisual information was tested. Additionally, the subjects' acoustic order threshold was tested and a phonological deficit task – reading nonsense words – was introduced.

Findings of our studies suggest that some dyslexics are not able to process simultaneous audiovisual speech signals with the acoustic signal being dominant over the visual input. A malfunction of bimodal speech perception seems to correlate with dyslexia and might yet be more than a mere side effect.

P1-22

Written word form learning: Orthographic fast mapping abilities of at risk children

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Recent research by Apel and colleagues (Apel, et al., 2006; Berninger, et al., 2006; Wolter & Apel, in review) suggests that young children quickly acquire knowledge of novel written word forms with minimal exposure. Using a fast-mapping paradigm similar to those used for assessing young children's spoken word learning, Apel and colleagues have demonstrated that children with typical language skills quickly store and retrieve orthographic information about novel words after four exposures to those words presented in a story context. Children with language impairment fast-map significantly less information. For both groups of children, significantly more orthographic information is fast-mapped when the novel words represent words with high phonotactic and orthotactic probability (i.e., words with phonemes, biphones, graphemes, and bigraphs that occur frequently in the English language). For children with typical language, orthographic fast-mapping predicts unique variance on reading and spelling measures, above that explained by phonemic awareness and letter identification. The same is true for children with language impairment, but only for reading. These findings support the notion that children utilize multiple linguistic resources during literacy learning early in development (see Repertoire Theory, Masterson & Apel, 2000).

Children with language impairment, known to be at risk for later literacy deficits, appear to lag behind their typical peers in orthographic learning (fast-mapping). Another population considered to be at risk for literacy development is children from low socioeconomic (SES) backgrounds, including those who use a dialect that differs from mainstream English. The purpose of this study was to further investigate orthographic fast-mapping by comparing the performance of children with typical language skills (non at-risk) and children considered to be at risk (low SES and/or use of non-mainstream English dialect).

Participants: 40 public school kindergarteners; 20 non-at risk (middle SES), 20 at risk (low SES and/or users of African American English); all English as a first language; no identified cognitive/language impairments

Stimuli: 12 monosyllabic words constructed to vary in phonotactic and orthotactic frequency (e.g., high-high: hess; high-low: knal; low-high: chab; low-low: gouz)

Procedure:

Orthographic Fast-Mapping Task administered:

Each novel word presented with a picture of a novel object via a PowerPoint story book presentation a total of four times. After each story, the children were asked to *"write what this thing is called"* and to identify the target words from an array of four words.

Other tasks administered: Phonological Awareness Test (Robertson & Salter, 1997):Phoneme Blending and Phoneme Segmentation subtests; modified elision task (Rosner, 1971); WRMT-R (Woodcock, 1998) Word Attack ,Word Identification, Letter Identification subtests, experimenter-designed spelling test; PPVT-3; K-BIT-2.

Results and Discussion:

Results demonstrated that the at-risk children fast-mapped significantly less orthographic information than their non at-risk peers. Like their non at-risk peers, orthotactic probability of the word affected at-risk children's fast-mapping; unlike their non-at risk peers, phonotactic probability did not. For both groups, orthographic fast-mapping accounted for significant unique variance on a measure of reading; orthographic fast-mapping only accounted for significant unique variance on spelling for non-at risk children. Discussion will

focus on possible causes for these findings, their relation to previous reports, and how the findings support a repertoire theory of reading and spelling development.

P1-23

Relationship between early speech delay and subsequent reading abilities in Spanish: An analysis from evolutive causal models

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This longitudinal study analyzes the relation between early speech delay (3/4 years) and the subsequent development of the phonological processing ((memory, naming, awareness) and reading abilities evaluated four and five years later.

We assigned 8 children that have had a speech delay when they were 3 years of age, identified by AREHA (Aguilar & Serra, 2003) (percentile 30-10) and 8 control children that showed normal values for their age (percentile 70-100). The phonological processing through PROFON (Lara, Aguilar & Serra, 2005) of these children was evaluated when they were 7-8 and 8-9 years of age and as well as their reading ability through PROLEC (Cuetos, 2002). The data were analyzed with non-parametric test of repeated measures (Z Wilcoxon) and independent measures (U Mann-Whitney). It was also computed various regression analysis.

These results showed that the children who had speech delay display performances in phonological processing and reading below the controls when the children were 7-8 and 8-9 years of age. The affected processes of reading change with time:

When they were 7-8 years of age the processes of decoding and word recognition are the most affected for they showed lower performance, but a year later, the comprehension difficulties were those that showed more difficulties. The abilities of phonological processing (memory, naming and awareness) presented lower performances in this group than in both 7-8 and 8-9 years of age control group.

These results were analyzed through a causal developmental model in which the roll of the phonological system was examined in the subsequent development of phonological processing and its relation in the development of the decoding, the recognition of words and the text comprehension.

P1-24

Phonemic awareness and segmental properties – The influence of oral and reading/writing skills

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This study is part of a larger project on the development of segmental awareness in European Portuguese and refers to the relation between phonological development and phonological awareness in the child's cognitive system. Research on phonological awareness is substantial (Brady & Shankweiler, 1991, Morais & Kolinsky, 1994, Morais, 2003, Veloso, 2003, among many others); however, studies on the impact of segmental properties in the child's phonological awareness are scarce.

The project evaluates children (n=71) from the 1st (n=22), the 2nd (n=28) and the 4th (n=21) years of reading instruction. They were grouped in 4 groups that were defined by their reading and writing abilities. For this poster, we will strictly focus on the results from groups 1 and 2, and compare the phonemic awareness associated to a scarce knowledge of reading and writing (Group 1) with the phonemic awareness associated to a better knowledge of reading and writing (Group 2).

The experiment was divided in two parts: section A included reading and writing tests; section B included tests to evaluate the children's phonemic awareness. On the section B, they were submitted to series of *oddity tasks*. In these tasks, they had to take the odd word out, i.e, the one with a different consonant at the left-edge of words (as in the sequence *bata, mota, bota,* where the odd word is *mota*). The stimuli were presented in a digital format. Both the answers and the reaction time measurements were automatically registered by using the *E.Prime*[1] program, version 1.1.

We focus our analysis of results on place and manner of articulation in order to observe the effect of (un)marked segmental properties (Labial, Coronal, Dorsal; [continuant], [nasal], [sonorant]) on the degree of accuracy in the performance of phonemic awareness tasks performed by the Portuguese children observed. For Group 1, results show that unmarked structures in the child's phonological system are not the easiest ones to be identified. Considering exclusively the manner features, it is clear that [+ continuant] segments are easier to detect than [- continuant] segments, not matching the order of phonological acquisition, where plosives emerge before fricatives and liquids. In what concerns the PoA, Coronal is generally the preferred one over the three classes of manner, therefore facilitating the identification task; similarly, Dorsal is the most problematic one, matching the results on the acquisition of the PoA mentioned in the literature (Fikkert & Levelt 2005; Costa & al., 2007). However, the three PoA show different behaviours when one considers the relation place/manner of articulation: (i) Coronal and Labial show a similar behaviour within the group of fricatives, confirming the preference for these two PoA in the processing of segments at the left edge of words; (ii) on the contrary, Labial is closer to Dorsal within the plosives group. For Group 1, our results therefore exhibit an interaction between place and manner of articulation, without any observed influence of reading and writing knowledge. For Group 2, the results are similar but show also an influence of reading and writing skills.

P1-25

Dyslexia with or without Specific Language Impairment: Differences in phonology and in auditory processing

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Developmental Dyslexia and Specific Language Impairment (SLI) are the most prevalent communication disorders in children. Recent studies show that about half of the dyslexic children also present a language impairment, and half of the children with SLI also experience difficulties with reading and spelling. Children with dyslexia and/or SLI appear to present two types of difficulties. First, a number of studies have shown that a phonological impairment is responsible for language and literacy difficulties, although some authors argue that this phonological impairment is specific to literacy problems. Second, a sub-group of children with dyslexia and/or SLI displays sensori-motor problems in terms of a general temporal processing impairment due to either an axonal alteration of magno-cells or an alteration of thalamo-cortical neurons responsible for rapid and short stimuli processing in the visual, auditory or tactile modality. This raises the question whether this sensori-motor (mainly auditory) impairment is causally related to or just co-morbid to literacy and/or language impairments. The aim of our study is to test the respective contribution of phonology and of auditory processing on literacy and language impairments. For the purpose, a group of dyslexic children was divided into two subgroups on the basis of oral language performance: A pure dyslexic group and a dyslexic+SLI group. All participants were assessed with an experimental battery of 3 phonological tasks and 5 auditory processing tasks as well as with several standard tests tapping literacy and

language comprehension. The results show that, as expected, the performance on most tests correlated significantly with the phonological tasks and with the auditory tasks. Stepwise regression analyses indicate that, after controlling for age and IQ, i) The variance in literacy tests is best explained by two phonological tasks (Non-Word Repetition and Phoneme Manipulation) and by one auditory task (Frequency Modulation); and ii) The variance in oral language tests is best explained by one phonological task (Non-Word Repetition) and by one auditory task (Frequency Modulation). Additional ANOVA analyses show that: i) Performance on the EVIP (French version of the PPWT) covariates with the Frequency Modulation performance in the same manner and proportion for both subgroups; ii) Performance on the ECOSSE (French version of the TROG) covariates with the Non-Word Repetition performance only in the pure dyslexic subgroup; iii) Performance in the Word Repetition task covariates with the performance in a Phoneme Manipulation task only in the dyslexic+SLI sub-group; and iv) Performance in one literacy task (Alouette, a text reading test) covariates with the Non-Word Repetition performance in the pure dyslexic subgroup, but covariates with Frequency Modulation in the dyslexic with SLI subgroup. These results show that Phonology and Auditory processing both contribute to literacy and language difficulties encountered in dyslexia and SLI, but in different manner. Moreover, some factors seem to covariate specifically to some symptoms and the links appear to depend on the subgroup.

P1-26

Metalinguistic awareness of graphotactics in Portuguese/German bilingual children: A pseudo-word writing task

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Children that attend a bilingual school learn simultaneously two different phoneme-grapheme correspondence-systems (PGC-S). The PGC-S of each language does not give unequivocal rules how to write all words of this language. In order to solve these ambiguities the children must learn context rules and build up a word form memory. The need to cope with two orthographic systems simultaneously is thought to foster the metalinguistic awareness of bilingual children.

After the informed consent of the parents and oral assent of the children, 83 pupils of the German School in Lisbon and 79 truly monolingual pupils of two different private schools, attending third to fourth grade, were reported. Children attending the German school were classified in three language proficiency groups: truly bilingual, German mother tongue and Portuguese mother tongue.

The material consists of a list of pseudo-words. For the creation of the pseudo-words we chose only phonemes that make part of the phonetic repertoire of both languages and that obeyed to the phonotactic rules of both. Although the phonetic form obtained, is the same for the two languages, the written form is different. Each list is 25 words long, preceded by 5 training items. The items were played back from a digital recording to groups of five to nine children in a dictation task.

The number of correct answers and the type of errors are the dependent variables in this study**.** Orthographic errors were analyzed on different levels. Errors are classified according to the phonetic and orthographic correctness and interference errors are scored separately.

We adopted the classification scheme of Bishop and Clarkson, 2003, for orthographic errors. In this scheme all forms are classified. Orthographically, phonetically and if both are acceptable or not (orthographically acceptable (OA); orthographically unacceptable (OU); phonetically acceptable (PhA); phonetically unacceptable (PhU)). We have considered Interference errors when a phoneme is written following the rules of the other language.

In what regards to the writing of pseudo-words, we expect bilingual compared to the monolingual children, to perform at almost the same level. The truly bilingual children will produce less phonetic unacceptable errors in both languages, because their auditory discrimination ability is supposed to be more accurate. Furthermore they will probably cope better with the ambiguities in the PGC-S thus producing less orthographical unacceptable errors.

We expect to observe interference errors especially for the pupils that are not truly bilingual. As there is no word form memory for pseudo-word, we expect to register a high incidence of interference errors for the pseudo-words, due to its writing, as it obliges the strict use of the phoneme-grapheme correspondence rules.

For the German pseudo-word list, no differences were found between the language groups. This result suggests an effect of the language of instruction that overrides the supposed better metalinguistic awareness. Bilingual children of the study group performed at the same level as the control group in the Portuguese pseudo word task, suggesting that in this developmental stage the bilingual children do not reveal a better metalinguistic awareness than their monolingual peers.

P1-27

The spelling sensitivity score: A measure of children's developing linguistic knowledge

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Spelling may be viewed as the consummate linguistic skill, requiring proficiency in several areas including knowledge and awareness of phonology, orthography, semantics, and morphology, as well as storage of clear and concise mental orthographic images (Apel, Masterson, & Niessen, 2004; Bourassa & Treiman,2000;Masterson & Apel, 2000). Spellings can be used to hypothesize what levels and types of literacy knowledge children have and use for the purposes of both reading and writing (Masterson & Apel, 2007). The purpose of this presentation is to describe a new measure, the Spelling Sensitivity Score (SSS), and provide data regarding its sensitivity to developmental changes in children's literacy performance in both structured dictation and open writing samples (Masterson & Apel, 2007). Based on a multiple-linguistic approach, the SSS represents what children's spellings reveal about their knowledge of the sounds (phonological), patterns (orthographic), and mental representations (MOIs) of words. For the *SSS-Segments*, each segment (i.e., sound) contained in a word is analyzed. A zero is assigned when a speller has not represented a segment with a grapheme or used a grapheme to indicate a segment that is not in the word. One point is assigned when the segment is represented orthographically, but illegally (e.g., TEMT for tent). A segment that is represented with a legal, but yet incorrect grapheme (e.g., KANDY for candy) receives a score of two. Correctly spelled segments receive a score of three. After scoring each segment, the scores are summed and divided by the total number of to yield an average *SSS-Segments*. An *SSS-Words* is calculated in a similar manner; however, the entire word is scored as phonemically inaccurate (0 points), phonemically accurate, but orthographically incorrect (1 point), orthographically legal (2 points) or correct (3 points), and an average *SSS-Words* is calculated. Calculation of *SSS-S* and *SSS-W* is made feasible by the design of an Excel file that automatizes much of the scoring and associated calculations (Masterson, 2007). In this poster, we will present SSS data from a variety of sources in order to provide preliminary evidence of the measure's validity. First spontaneous writing samples were collected from children in the third (n=28), fourth (n=26), and fifth (n=24) grades during Months 1, 5, and 9 of the academic year. Three 2--way (time by grade) ANOVAs for repeated measures with were conducted to compare changes in the *SSS-S, SSS-W* and the more traditional measures, percent words spelled correctly (PWSC) and percent segments spelled correctly (PSSC). There were significant main effects for time and grade on *SSS-S* (time: F [2,75]=9.2, p<.0001; grade: F [2,75]=11.9, p<.0001), *SSS-W* (time: F [2,75]=7.5, p<.001;grade: F [2,75]=8.9, p<.0001), PSSC (time: F [2,75]=13.0, p<.0001; grade: F [2,75]=12..6, p<.0001,

PWSC (time: F [2,75]=9.2, p<.0001;grade: F [2,75]=11.9, p<.0001). Post-hoc analyses indicated greater sensitivity to differences between samples and/or grade levels in the SSS measures than in the percent correct measures. Specifically, *SSS-S* yielded time (Months 1, 5, 9) differences that did not show up with PSSC, and *SSS-W* yielded significant grade-level differences that did not show up with PWSC. *SSS-S* and *SSS-W* scores derived from responses to two single-word dictation tasks (Test of Written Spelling-4 and Spelling Performance Evaluation for Language and Literacy) that require children to attempt a words with a variety of phonemic, orthographic, and morphological structures also will be presented Discussion will focus on the utility of the SSS system for marking developmental changes in the linguistic knowledge children apply to their spelling and on the relationship of the SSS measures to scores of reading performance.

P1-28

Cognitive, speech and language profile in pre-school and school children with Bardet-Biedl syndrome

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The purpose of this study is to examine BBS cognitive, speech and language profile with age and genetic mutation. Bardet-Biedl syndrome (BBS) is a heterogeneous autosomal recessive genetic condition with twelve gene loci mapped to date. The phenotype of BBS varies from one family to another and within families, with only subtle phenotypic differences related to the different genes identified to date. The accepted major criteria for diagnosis include retinal dystrophy, obesity, polydactyly, male hypogonadism, mental retardation and renal dysfunction. A number of associated features, including neurological, speech and language deficits, behavioural traits, facial dysmorphism and dental anomalies have also been identified. Language development is delayed in many cases, although this may be commensurate with overall cognitive functions. Developmental delay has been widely described as a major feature of BBS, with two-thirds to three-quarters of patients performing with mental retardation on standardized behavioural measures (IQ<50).

Twenty-one children with BBS were identified through the Clinical Genetic Department and tested at the INSERM-Clinical Investigation Center (CIC) at Hospital for Children, Paris, France. Ethical approval was obtained from the Research Ethics Committee. Two French Standardized Speech and Language tests (L2MA and BELEC) were administered to these children to examine spoken linguistic components, reading and spelling. The Wechsler Intelligence Scale for Children, Third Edition, full-scale intelligence quotient ([IQ] FSIQ), verbal IQ (VIQ), and performance IQ (PIQ) scores were also recorded as well the following cognitive tests (PEP, FROSTIG, BEM, STROOP and WSCT to assess multiple levels of cognitive functions within and across domains (Attention, Visual Perception and Memory).

Results show specific profiles, type of « splinter skills » of cognitive and language development for 5 children, average cognitive and language delay for 11 children and mental retardation on all domains of speech, language and cognition only for 5 children. Such pattern of results all contribute to the view that the core deficit of children with BBS are not mental retardation and provide new clues to the relation between genes and behavior. This heterogeneous profile does not show neither a core deficit and a global cognitive retardation in all children. Further research will investigate whether the three cognitively identified group correspond to specific genetic patterns.

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P1-29

The interplay of language structure, motor programming and executive functions in speech planning: A comparison of Specific Language Impairment, Williams syndrome and high functioning autism

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Background. What aspects of language development are most closely related to executive functions? An answer to this question would have a high impact both on theories of language acquisition and practices of clinical intervention (Bishop & Norbury 2005; Joseph, McGrath, Tager-Flusberg 2005). Prosodic envelopes constitute an interface between higher-order cognitive systems (intentionality, perspective taking), language structure and physiological systems (motor programs, coordination between breathing, phonation and articulation). In this view, prosodic planning is a key aspect of speech planning, and provides a window into on-line multimodal verbal self-regulation mechanisms.

Aims. 1) To investigate the prosodic planning profiles of children belonging to three main nosological classes: Expressive Specific Language Impairment, Williams Syndrome and High-Functioning Autism; 2) To verify whether measures of speech fragmentation correlate with non-verbal neuropsychological measures of on-line planning skills.

Materials and methods. Ten Italian children per clinical group participated in the study: three groups of ten typically developing Italian children (5 males, 5 females) aged 4, 5 and 6 years respectively were also selected as chronological (wrt SLI) and mental (wrt WS, AUT) age controls. The Pic-Nic Story, a colored wordless picture book, modelled on the Frog story, was used to elicit verbal production. Audio recordings were transcribed according to the CHILDES Project indications (MacWhinney 1997). Utterances were coded following the illocutionary criterion based on prosodic contours (Cresti 2000). MLU as well as indices of clause complexity and diversity, and measures of lexical diversity were calculated. Perceptive analysis of speech contours, together with instrumental wave form analysis using Praat version 4.4.25, distinguished linear complex utterances from patterned complex utterances. Fragmentation episodes were classified into three classes: retracting, interruptions and suspensions. Further, the Tower test (NEPSY 2, Korkman, Kirk, Kemp 2007), and the digit span test (forward and backward, WPPSI, WISC-III) were administered to children belonging to each clinical group.

Results. 1) Children with expressive SLI displayed a major difficulty in utterance initial position (significantly higher percentage of retracting episodes), while WS children had a significantly higher percentage of interruptions in utterance middle position. Autistic children displayed a a higher percentage of utterance interruptions. While SLI children's speech profile seems to depend on the underlying phonological and syntactic disorders, WS children's performance may be attributable to a de-syncronization of the prosodic

and linguistic planning schemata. The fragmentations dysplayed by Autistic children have a large impact on the intellegibility and overall coherence of their discourse. 2) For all clinical groups, neuropsychological measures of planning (Tower), attention (forward digit span), and working memory (backward digit span), showed significant correlations with prosodic fragmentation indices but not with linguistic indices such as lexical diversity.

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P1-30

Grammatical constructions in Cri du chat syndrome – findings from a case study

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Cri du chat syndrome (CCS) is a genetic disorder resulting from loss of genetic material from the short arm of chromosome 5. Symptoms include delayed and deviate linguistic development, most notably a discrepancy between chronological and linguistic age and between receptive and expressive linguistic abilities. Earlier studies have also reported severe articulatory problems (see i.a. Cornish & al 1999; Kristoffersen 2007). To my knowlegde there are no previous studies on syntactic production in CCS.

In my presentation I focus on grammatical constructions in CCS, based on a case study of a 13-year old Norwegian girl (H) with this syndrome. My primary research question has been to what extent H's sentences are instantiations of sentence constructions in the target language, and to what extent and how they deviate from target language constructions.

The theoretical framework of my study is construction grammar as outlined in i.a. Croft (2001), Goldberg (2006), and, in particular, Tomasello (2003). Tomasello has proposed a typology of early syntactic constructions: (i) holophrases, i.e. single linguistic symbols expressing a communicative intention relating to a specific experiential scene, (ii) two-word combinations, where both words have equal status (e.g. *ball table*), (iii) pivot schemas, where one word (the pivot) determines the speech act of the utterance as a whole, (iv) item-based constructions, where grammatical meaning is expressed by morphology, adpositions or word order, but related to particular lexical items, and (v) abstract constructions, which are abstractions over a range of item-based constructions. In my presentation I will show that all these types are present in the syntactic constructions produced by H.

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P1-31

Communicative gestures and lexical development in children with Down syndrome

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There is some evidence in the literature of a preference for the use of gestural than vocal productions in children with Down syndrome, during the first stages of language development (Caselli, Vicari, Longobardi, Lami, Pizzoli & Stella, 1998; Chan & Iacono, 2001).

However, this "gestural advantage" could actually be due to a developmental strategy, used to compensate the difficulties in speech articulation that are characteristic of language development in this population (McCune, Kearney & Checkoff, 1989; Iverson, Longobardi & Caselli, 2003).

The principle aim of the present study is to verify the existence of a similarity between some processes that characterize language development in children with Down syndrome and those that characterize typical development. In particular, we have considered the use of gestures in relation to the psychomotor and lexical development and we have investigated the potential role of gestural communication as a predictive index of the following vocabulary development in children with Down syndrome.

Participants in this study are twenty 36-month-old (range = 35;28 – 38;18) Italian children with Down syndrome. The spontaneous gestural production of each participant has been assessed during a mother-child play session; five categories of gestures were coded: Pointing, showing, conventional, iconic and emphatic. Moreover, the psychomotor development was evaluated using the Brunet-Lézine Scale of Infant Development (Brunet & Lézine, 1975) and the children's lexicon, both in production and in comprehension, was assessed using the Italian version of the MacArthur Communicative Development Inventory (Il Primo Vocabolario del Bambino – Caselli & Casadio, 1995). Following a longitudinal perspective, parents were requested to fill in the inventory six months and one year after the first evaluation (i.e. at 42 and 48 months).

From the analyses carried out, a significant relationship has been found between the scores achieved on the Brunet-Lézine psychomotor scale and the frequency of gestures produced. A synchronic relation has been found also between word comprehension at 36 months and the total amount of gestures exhibited (in particular, the frequency of pointing, conventional and iconic gestures); on the contrary, no significant relationship has been found between word production and any measures of gestural use, as found in different studies on typical development (Bates & Dick, 2002; Bretherton, Bates, McNew, Shore, Williamson & Beeghly-Smith, 1981).

Moreover, results underlined a significant correlation between gestures produced at 36 months and the following vocabulary size, assessed at 42 and 48 months; therefore, gestures could be considered as a significant predictor of lexical development in children with Down syndrome, as verified in typically developing children (Watt, Wetherby & Shumway, 2006).

P1-32

Understanding of speaker certainty by children with autism: Based on prosodic and lexical cues

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This study examined autistic children's understanding of speaker's certainty expressed in linguistic and paralinguistic cues in utterances. Numbers of studies showed that people with autism exhibit abnormalities in recognizing indicators of other people's mental states, such as intention, emotion, belief, and so on. As well as nonverbal information such as facial expression and gaze direction, verbal information may also become greatly useful to detect other's psychological states. Past studies reported that autistic children do not use lexical items that express *cognitive* states of their own or others (e.g. *know*, *think*), while they spontaneously refer to *emotional* or *intentional* states at the same frequency as the control groups (Tager-Flusberg, 1992: Tager-Flusberg & Sullivan, 1995). As with these lexical markers, prosodic characteristics also provide important information for mind reading. Some studies have found that autistic children are able to report the speaker's basic emotional states properly as the controls (Loveland, et al., 1997 Boucher, et al., 2000), but their performance on *cognitive* indicators expressed in prosody has not investigated so far.

In this study, we are particularly interested in the following two types of clues in utterances, which encode degrees of speaker *certainty* (i.e. high or low) about the information expressed: (a) sentence-final particles in Japanese ("*yo*" vs. "*kana*") and (b) sentence-final intonation (fall vs. rise). We presented participants a pair of conflicting statements, each of which is marked with high or low speaker certainty, and let them choose the more reliable information. If they are aware of the certainty contrasts expressed in these items, they would follow the information that is marked with the higher degree of certainty; that is, the statement marked with the particle *yo*, or the statement ending with falling intonation.

Autistic children aged between 6-9 and the typically developing children as a control group participated in a word-learning task. In each trial, two novel objects were presented on the computer screen and children were asked to choose which one is the object that a novel noun (e.g. *toma*) refers to. The only clues for the judgment were two conflicting utterances paired with one of the two objects. Each sentence was marked with high/low certainty under either the lexical contrast condition ("This one is toma *yo*." for object A vs. "this one is toma *kana*." for object B) or the prosodic contrast condition ("This one is toma." vs. "This one is toma?"). Based on the expectation that one object is going to move ("Look! Toma is going to move!"), their anticipatory looking times for the two objects were measured by eye tracking methodology.

The result showed that, in both lexical and prosodic conditions, autistic children did not look at the object marked by higher certainty significantly longer than the other, while control groups clearly showed the difference. This indicates that autistic children have difficulty in using sentence-final particles and intonational contrasts for understanding other's strength of beliefs. It was also found that the intonational differences are more difficult for them to use as a sources of their judgment.

P1-33

Grammatical strengths and difficulties in the language comprehension of young children with autism

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Research on the grammatical abilities of children with autism has revealed both strengths and weaknesses; for example, they demonstrate steady growth in MLU across development (Tager-Flusberg et al., 1990) but also frequently omit grammatical morphemes (Fein et al., 1990; Eigsti et al., 2005). These findings have relied on production data, though, which can be unreliable in a disorder in which children are disinclined to speak. In this study, we assess the language *comprehension* abilities of 14 children with autism, using intermodal preferential looking (IPL). The children saw two videos; one tapped their use of syntactic frames (Naigles, 1990), the other their understanding of wh-questions (Seidl et al., 2003).

Children are tested every four months in this ongoing longitudinal study. At the onset of the study, the children had a mean age of 33 months, had begun intensive ABA therapy, and had language scores comparable to 20-month-old typical children. At Visit 4, when the children viewed the syntactic bootstrapping and wh-question videos, they averaged 44.2 months of age and produced on average 42% of the words on the CDI checklist (range 0-197 words on the Toddler form, 45-75 words on the CDI-III). Their mean age-equivalent score on the Mullen visual reception scale was 41.65 months.

The children viewed two IPL videos. The syntactic bootstrapping (SB) video taught four novel verbs in the transitive frame ("The duck is gorping the bunny."). During the teaching trials, a duck and a bunny engaged in simultaneous novel causal and noncausal actions. During the control and test trials, the characters engaged in the causal action on one screen and the noncausal action on the other screen. The control audio was "Look, they're different now" and the test audio was "Find gorping!" The wh-question (WHQ) video showed 'hitting' events (e.g., an apple hitting a flower), followed by test trials in which the apple and flower were shown on separate screens. The WHQ test audios were "What did the apple hit?/What hit the flower?"; the Name control audios were "Where's the apple/flower?."

Children's eye movements were coded off-line. For both studies, children should look longer to the matching screen during the test trials compared with the control trials.

For the SB video, the ASD group significantly preferred the matching screen for the test trials (54.6%) over the control trials (43.35%; $t(9) = 2.07$, $p = .03$). Thus, they learned that the novel verb referred to the causal action. For the WHQ video, the children showed no significant looking preferences when hearing the wh-questions. Comparison groups of typically developing children (chronologically younger) demonstrated significant looking preferences with both videos.

In sum, young children with autism are able to use frame-based syntax to learn the meanings of novel verbs; however, at the same point in the development (and using the same method), they do not yet demonstrate the ability to understand wh-questions. These findings support the claim that even higher-functioning children with autism do not have intact grammatical abilities; instead, these abilities seem to fractionate along a syntax/morphology boundary.

P1-34

Language development of autistic children in Chinese mother-child communication: A language profile different from western ones

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Language development of autistic children has received ample scholarly attention. However, no adequate Chinese research currently exists in the literature of this field. What is the general picture of language development of autistic children in Chinese context? How are they learning language in communication with their mothers? The study report in this paper aims to explore atypical language development of Chinese autistic children.

The data presented here are part of a larger growth model study. As one of the four groups of atypical language children, six autistic children aged 3.5 years are selected from an inclusive kindergarten in Shanghai. They are observed and video taped 30 minutes each month for 18 months. The data are collected at home when children play and talk with their mothers.

The research reveals a continual but atypical growing language profile of autistic children during their preschool years. Using different measures, the study finds that autistic children get lower marks of MLU, MLU5, Word Types and Word Token than their regular Chinese peers. However, the growth model lines show that the autistic children have growing repertoires of communicative acts. In comparison to their regular peers, the autistic children seem to perform more communicative acts in interaction with their mothers. This result may be considered as a language profile different from western theory. The study also finds that the mothers of autistic children have stronger intentions of leading their children's joint- attention, and display much higher control behaviours than mothers of regular children. During the process of interaction, the information exchange, which has been considered as a cultural focus, seems to be confirmed again as the central task in communication between the mothers and their autistic children. These mothers' communicative characteristics have produced influence on their autistic children and help to build up those children's communicative behaviours.

P1-35

Assessing language growth and delay between ages 5 and 7

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Language samples are often taken to be the gold standard for accurate observation of children's language ability, and have been recommended as alternatives to using standardized language tests (Lund & Duchan, 1993; Stockman, 1996). For children who speak non-standard dialects, they are considered essential (Wyatt, 2002). Language sample analyses typically focus on measures of utterance length, grammatical complexity, and lexical diversity. However, a lack of precision about developmental expectations for such measures, especially at older ages, limits their usefulness in diagnostic settings.

This paper examines language sample measures in a group of 78 African American typically developing and language impaired children between the ages of 5;0 and 6;11 to determine which measures were most sensitive to differences in age and clinical status within that range. There were approximately 20 children at each of four 6-month agebands. Twenty of the children had been diagnosed as language impaired and were receiving language intervention services. Language samples were elicited by certified speech-language pathologists according to a structured protocol designed to produce narratives, explanations, and some general conversation. To confirm their clinical status, all children were also given the *Diagnostic Evaluation of Language Variation (DELV-NR,* Seymour, Roeper & de Villiers, 2005*),* a test designed to be unbiased against dialect speakers.

Language samples, which averaged 175 utterances, were coded and entered into SALT 7.0 and Computerized Profiling (Long et al, 2003). The quantitative measures produced included mean length of utterance in morphemes, number of different words in 50 utterances, the IPSyn, and mean clausal and phrasal complexity according to LARSP analysis. A second set of qualitative analyses evaluated the children's responses to the narrative and expository prompts and produced a Pragmatics Composite. The language sample measures were correlated with age in months and mean scores for the agebands were compared. These measures were also compared with the children's composite score on the *DELV-NR*, as well as their profiles on the Syntax, Semantics, and Pragmatics domains.

The *DELV-NR* confirmed that the typically developing children exhibited measurable development in 6-month age bands. In analysis of variance, DELV scores were significantly different by age band and by clinical status. By contrast, lexical and grammatical measures from the language samples did not differ significantly by ageband, and no significant correlations were found between age in months and the lexical and grammatical measures. Only the authors' pragmatics score was correlated with age and differed significantly by ageband. Most of the language sample measures were significantly correlated with the *DELV-NR* scores.

Although the two sets of scores were correlated, the language sample measures were less sensitive than the *DELV* to developmental growth over the age range from 5 to 7. Adding the time involved and the difficulty of obtaining reliable transcripts of language samples, we conclude that the same information is more easily and reliably obtained from the *DELV*. If language samples must be used, it is important to structure the interviews to elicit narrative and expository speech from the children, and not just general conversation.

P1-36

The early lexical development and its predictive value to language skills at two in prematurely born very low birth weight children

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The aim was to analyze the development of early receptive and expressive lexicon and to study its predictive value to language skills at two years in prematurely born very-low-birth-weight (VLBW, birth weight ≤ 1500 g) children. The lexical development of the 32 VLBW children was compared to that of 35 full-term controls. All subjects were singletons, their mothers´ first-borns and children of the monolingual Finnish speaking families.

The data of the lexical development was gathered at 0;9, 1;0, 1;3, 1;6 and 2;0 using the standardized Finnish version of the MacArthur Communicative Development Inventory (Fenson et al., 1994; FinCDI, Lyytinen, 1999). The criteria for understood and expressed word were specified. Each mother and her child were met at each data collection point, and the FinCDI was reviewed with the mother to ensure that criteria for a word were met. The language skills of the children were tested using the standardized Finnish version of the Reynell Developmental Language Scales (Edwards et al., 1997; Kortesmaa et al., 2001) at 2;0. The growth and

compositional development of the receptive and expressive lexicon were studied (Bates et al, 1994) and the associations between the lexical growth and the performance in the Reynell´s test were analyzed in VLBW children and compared to that of controls.

The VLBW children acquired their receptive lexicons at slower rate and performed weaker in Reynell´s test than the full-term children. A significant difference in the expressive lexical acquisition was detected if all VLBW children were included in the analysis, but not if the expressive lexicon growth of only neurologically intact VLBW children were analyzed. The early receptive vocabulary size was associated with the performance in the Reynell´s test at 2;0. Findings suggest that the development of the language skills of the VLBW children should be followed in detail. They also propose that early receptive vocabulary is an early predictor of later linguistic growth in VLBW children.

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P1-37

Assessing developmental changes in spelling in at risk kindergarten and first grade children

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Spelling is a complex, linguistic skill (Apel, Masterson, & Niessen, 2004). Recent research demonstrates that several linguistic knowledge resources serve as the foundation for spelling abilities (Bourassa & Treiman, 2001; Kelman & Apel, 2004). These linguistic resources include knowledge and awareness of phonology, orthography, semantics, and morphology, as well as clear and concise mental orthographic images (MOIs; Apel & Masterson, 2001). Spellers must access and apply one or more of these linguistic resources to be successful in conveying their intended written messages.

Recently, we have provided suggestions for two different methods for assessing children's spelling for the types of linguistic knowledge resources used during spelling (e.g., Masterson & Apel, 2007; Masterson, Apel, & Wasowicz, 2006). One procedure that can be used to assess children's spellings in written compositions or in spelling dictation tasks is the Spelling Sensitivity Scoring procedure (SSS; Masterson & Apel, 2007) This procedure is based on a multiple linguistic approach to spelling; scores are based on what children's spellings reveal about their knowledge of the sounds (phonological), patterns (orthographic), and mental representations (MOIs) of words. Using the *SSS*, each segment (i.e., sound) contained in a word is analyzed. A zero is assigned when a speller has not represented a segment with a grapheme. One point is assigned when the segment is represented orthographically, but illegally (e.g., temt for tent). A segment that is represented with a legal, but yet incorrect grapheme (e.g., kandy for candy) receives a score of two. Correctly spelled segments receive a score of three. After scoring each word, the total number of segments is divided by the total points rendering an average *SSS* score. All scoring for SSS is automated within an Excel file designed specifically for the procedure. Preliminary results suggest that the SSS is sensitive to developmental changes across grades 1 to 6 for children with typical language and literacy abilities (Masterson, 2007).

The purpose of this study was to determine whether the SSS could be used for marking developmental changes in spelling development in kindergarten and first grade children who are at-risk for literacy development. The children in this study were considered to be at-risk because they attended schools that were primarily African American (78%) and low SES (90% qualified for free or reduced lunch); both these variables have been show to put children at risk (Bornstein & Bradley, 2003). If the SSS is a valid measure of spelling development over time, then subsequent studies on the effectiveness of different spelling interventions can use the SSS system for scores that serve as dependent variables. In this study, the spellings of 31 kindergarten and 28 first grade children considered to be at-risk for literacy development were assessed across an academic year at three time points using the SSS system. The spellings were obtained through a dictated spelling task. Results of this study revealed that the SSS system can be used to differentiate the spellings of kindergarten vs. first grade children at three points across an academic year; first grade children consistently utilized more phonological and orthographic knowledge than kindergarten children, $F(1, 57) = 74.23$, $p < .001$, partial $\eta^2 = .57$. Further, the SSS system was sensitive to within group developmental changes across an academic year for each grade, $F(1, 57) = 18.38$, $p < .001$, partial $\eta^2 = .85$ (differences between each time were significant at $p < .001$). Discussion will focus on the utility of the SSS system for marking developmental changes in the linguistic knowledge children apply to their spelling.

P1-38

Evaluating inter-rater reliability and clinical applicability of the constraint-based nonlinear phonological assessment tool NILPOD

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Phonological assessment tools have to incorporate complex linguistic theories in order to reconstruct the client's phonological system in as much detail as possible. At the same time unambiguity of analyses results and clinical applicability constitute essential components. The phonological assessment tool NILPOD (Ullrich & Bernhardt, in app.: Nichtlineare phonologische Diagnostik,) is based on a constraint-based nonlinear framework, in which phonological strengths and needs (as determined by negative constraints) are identified within and between the different levels of the phonological hierarchy: the phrase, the word, the foot, the syllable, subsyllabic units such as onset, rime or stress-attracting units (moras), segments (phonemes) and hierarchically organized features. Thus the analysis allows for a detailed description of the child's phonological system and a precise selection of therapy targets.

An evaluation study was conducted to evaluate NILPOD in terms of inter-rater reliability and clinical applicability. It is hypothesized that different trained clinicians come to the same results in terms of identifying strength and needs in the analysis of the same speech samples and that NILPOD is applicable in clinical practice.

60 clinicians were trained in a three-day workshop to apply the assessment tool NILPOD. Years of clinical practice ranged between 2 and 35 years, implying different degrees of clinical expertise. Participants received an extensive introduction to constraint-based nonlinear phonology before performing phonological analyses using NILPOD. After the training every clinician obtained transcribed data from NILPOD speech samples of four German-speaking children with phonological impairment. Clinicians were asked

(1.) to analyze the data, using the NILPOD analysis and identify strength and needs on the various levels of the phonological hierarchy and (2.) complete an evaluation form concerning applicability of NILPOD in clinical practice.

Preliminary results show that there is high agreement among clinicians for all identified categories. Agreement is highest on the identification of strength and needs on the prosodic tier, as well as on the segmental tier, whereas interaction between tiers shows more variability. In terms of clinical applicability clinicians emphasize the relevance of analyses results for goal selection especially for children with moderate to severe phonological impairment. Main criticism is the time load necessary to conduct the detailed analyses.

Results will be used to optimize NILPOD in the analysis parts with lowest inter-rater reliability. Also attempts will be made to improve time efficiency without compromising on the theoretical framework.

P1-39

Prosodic abilities in Spanish adolescents with Williams syndrome

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Williams syndrome (WS) is a neuro-developmental disorder characterized by a complex pattern of strengths and weaknesses (Bellugi, Lichtenberger, Jones, Lai and George, 2000). Although using and interpreting prosodic clues of speech adequately is necessary if communication and social interaction is to be effective, there is paucity of research on this linguistic domain in WS. Recent research has pointed out not only deficits but also atypical characteristics in different prosodic abilities of both English and Spanish speaking children with WS (Garayzábal, Sotillo and Campos, 2002; Setter, Stojanovik, van Ewijk and Moreland, in press; Stojanovik, Setter and van Ewijk, in press). Whether these prosodic deficits remain in adolescence in WS is an issue that still needs to be addressed. In the present study, prosodic abilities of a group of fourteen Spanish speaking adolescents with WS (aged between 12;2 and 17;7, mean age of 15;4) were compared with those of a control group of twenty-eight Spanish speaking typically developing adolescents matched one by one on chronological age. In order to measure cognitive level, the WISC-IV battery (Wechsler, 2005) was administered to all participants. Prosodic abilities were assessed using the *Profiling Elements of Prosodic Systems-Children* battery (Peppé and McCann, 2003) in its new Spanish version (Martínez-Castilla and Peppé, submitted). Results showed a significantly lower performance in WS in all prosodic abilities assessed except for the comprehension of affective prosody and the imitation of intonation patterns over shorter prosodic domains where no differences were found. In general, after controlling for the effect of cognitive level, previous differences between groups did not reach statistical significance. Nevertheless, for the comprehension of the grammatical function of chunking, where syntactically ambiguous sentences needed to be disambiguated by prosody, differences remained in favour of the control group. These results suggest that prosodic abilities in WS adolescents are not in line with their chronological age. Yet, prosodic abilities seem to be appropriate relative to their cognitive level in general terms. However, results on the chunking function suggest that this prosodic ability is dissociated from general cognitive level in WS, which would involve a specific deficit in this particular domain. This deficit, together with the existence of preserved areas, would mean heterogeneity in the prosodic profile of WS adolescents, supporting results reported by Caterall, Stojanovik, Szczerbinski and Wells (2006) and Plesa-Skwerer, Schofield, Verbalis, Faja and Tager-Flusberg (2007). Finally, the spared ability to understand affective intonation is in consonance with the view of WS individuals as very sensitive to perceive emotional expressions (Plesa-Skwerer, Schofield, Verbalis, Faja and Tager-Flusberg, 2007; Reilly, Klima and Bellugi, 1990).

P1-40

Frequent frames and noun categorization in Spanish child-directed speech

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Grammatical categories such as Noun or Verb are the basic categories from which language learners build syntactic structure. Nativist accounts of language acquisition have claimed such categories to be innately specified. One of the main arguments for linguistic nativism is the so-called *Poverty of the Stimulus Argument*. The main claim is that children cannot learn the basic properties of their native language on the basis of the input alone, since the fundamental features of language are scarcely represented in the child's linguistic environment and cannot, therefore, be learned from experience.

The present poster undertakes a critical examination of this assumption. In particular, we examine the possibility that certain distributional cues in the input, namely the so-called bigrams or frames, play an important role in constraining information to young language learners. The statistical frequency of these contexts would trigger the categorization of words in their grammatical category.

Several previous studies have also examined the role of frequent frames in the grammatical categorization of words (Cartwright & Brent, 1997; Mintz, 2003; Redington, Chater & Finch, 1998). In previous analyses, frames are defined as a set of frequently co-occurring words with one intervening word. In our study, we expand the notion of frame to a set of frequently co-occurring units. In our analysis of the noun category in Spanish, we take a combination of determiners and inflectional morphemes as co-occurring units that can accurately reveal the grammatical category of the intervening word, since both determiners and inflectional morphemes are very limited in number and extremely frequent.

Three Spanish corpora from the CHILDES database served as input for the analysis procedure. We only analyzed utterances spoken by adults. We only considered utterances addressed to children aged 2;6 or younger. For the analysis, we only considered all possible frames which were frequent in the input and which would yield an accurate categorization of nominal elements.

The main findings reveal that frequent frames in Spanish are extremely effective for the categorization of Spanish nouns that appear in children's input. Thus, a limited set of frames, mostly made up of closed-class items and inflectional morphemes, serves to the categorization of nouns in Spanish with a high degree of accuracy. Given a learner who is sensitive to these frames and their frequency of occurrence, the linguistic input provides information which is sufficiently and consistently represented from which to build a grammatical category for nouns. Thus, results from this study, reveal that the role of input for grammatical categorization has been grossly underestimated in nativists accounts. Input might then play a greater role in grammatical categorization than was previously assumed.

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P1-41

Fast mapping between grammatical constructions and meaning: An experiment in French children aged 3 to 4

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A fundamental issue in language acquisition, especially from a usage-based perspective, is to explain how children are able to generalise from item-based knowledge to a more general pattern-based form of knowledge. Casenhiser and Goldberg (2005) demonstrated experimentally how children came to learn mappings between novel phrasal forms and novel meanings. They showed that children could learn meaning associated with a novel word order on the basis of a minimal input, even without the help of a stable morphological cue.

The goal of the current work is to try to reproduce the experiment of Casenhiser and Goldberg in another language, i.e. French. Moreover, French has some notable differences from English. Especially, although it follows the same verb order as English, word order is not as constrained, changing the word order for emphasis and other pragmatic reason is not unusual. So changing word order may not provide a sufficient cue for children to learn new syntactic patterns (Kail and Charvillat, 1986).

The first experiment will reproduce Casenhiser and Goldberg's. A new, non-canonical, word order (NNV) will be associated to an original meaning (apparition of an object). Children have only 16 examples to learn this new association between grammatical construction and meaning. The test procedure is a forced choice between new uses of the NNV constructions (all test examples were not used during the training phase) and distracters. A second experiment will be implemented where the syntactic cue will consist in creating a new preposition (nonsense preposition) with the same meaning as in the word order experiment. The format of the experiment, training phase and test, remain the same. The two experiments will be run on different children, with age ranging from three to four. All children will have normal language development.

If Casenhiser and Golberg results are confirmed, this would mean that young children are indeed able to learn new mappings between grammatical structure and meaning very quickly, which would make a huge step in explaining how children learn to generalise grammatical knowledge so quickly. It remains to see if word order is a sufficient cue, even when it is not a major cue in a language. Also, this would stress out the fact that huge repetition effects are not necessary to learn a language using simple association principles. It remains to see if a similar experiment could be done in a language production task and not only in a language comprehension experiment.

P1-42

Skewed distributions in the input and formulaic matrix clauses in early complement clause constructions: A case study in German

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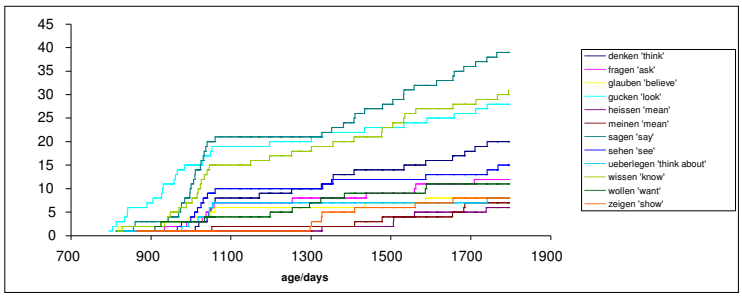
It has been claimed for English that children's first finite complement-clause constructions contain a formulaic matrix clause and a non-subordinate complement clause (Diessel & Tomasello, 2001). Formulaic matrix clauses develop out of highly frequent, fixed matrix-clause frames, which can be reanalyzed as epistemic markers or attention getters (e.g. Thompson, 2002): an utterance such as *I think it'll rain tomorrow* can be paraphrased as *Maybe it'll rain tomorrow.* We investigated whether the input of German-speaking children contains any complement-clause constructions with matrix clauses that can be categorized as fixed and formulaic and whether this influences their ease of acquisition. Furthermore, German is a good case to test whether children's first complement clauses are non-subordinate because it uses different word orders for main clauses, which are verb-second, and subordinate clauses, which are verb-final.

The analysis is based on data from a monolingual German-speaking boy and his mother. The data consist of almost 400 one-hour recordings between 2;0 and 5;0. We analyzed 2075 (all) complement-clause constructions produced by Leo and 1300 from a sample of his input. We determined Leo's twelve most frequent complement-taking verbs (CTVs), which can account for 90% of all his sentential complements, and investigated how flexibly they were used in the input. This was done by counting the number of matrix-clause frames (determined by subject, tense, and modification or negation) for each frequent CTV and calculating, with Shannon-Weaver values, whether the CTVs occurred in each frame with equal likelihood or whether they were mainly used in just one specific frame. Skewed distributions are indicated by low Shannon-Weaver values.

Leo showed a significant tendency to first acquire the CTVs that were least flexibly used in the input, i.e. the CTVs that had the lowest Shannon-Weaver values. For example, the second most frequent CTV *glauben* 'believe', which was among Leo's first CTVs occurred in five different frames in the input. However, 95% (177/186) of the matrix clauses with *glauben* 'believe' had the fixed form *ich glaube* 'I believe'. Not only did Leo acquire the inflexibly used CTVs first, he also started using them in the fixed matrix-clause phrases that they were most frequently used in in the input. Only later did he also use the CTVs in other frames, i.e. with a greater variety of subjects and tenses (see figure below).

The assumption that the early complement clauses used with these fixed, formulaic matrix-clause frames are non-subordinate can be backed up by word-order data in German. The formulaic matrix clauses that are acquired first mainly occurred with verb-second, i.e. non-subordinate, complements. Both Leo and his mother, for example, used the fixed phrase *ich glaube* 'I believe' with verb-second complements over 90% of the time. Overall, Leo showed a significant tendency to first produce the CTVs that had a bias towards being used with verb-second, non-subordinate, complements. Only later did he use a greater variety of less frequent
CTVs in a greater variety of matrix-clause frames, which were biased towards being used with verb-final complements.



P1-43

Pragmatic semantic factors and input play a role in Danish children's development of passive constructions

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Children's acquisition of passive constructions such as "the cat is washed by the dog" are known to be relative late acquired in Indo-European languages (English, German, and Hebrew). Passive constructions are also one of the areas of grammar that children with SLI have specific difficulties with. At least three explanations of why passive constructions are late acquired have been offered: (1) the maturation explanation; movement of the NP (as object to the subject position) matures late (Borer & Wexler, 1987), (2) the non-canonical mapping of meaning onto the syntactic structure (Budwig, 1990) and (3) passive constructions are infrequent in input to children (Tomasello, 1988).

Danish challenges these explanations in that it employs two types of passive constructions a) morphological passive and b) periphrastic passive (Heltoft & Jakobsen, 1996). The two passive forms express different moods involving: the speaker's prediction versus the normative decision. If passive comprehension can be explained related to late maturation or to the child's confusion regarding non-canonical structures, we would predict Danish children to acquire both types of passive constructions in synchrony. If, on the other hand passive comprehension is also influenced by input factors as well as pragmatic-semantic aspects, we would predict children's acquisition of passive constructions to: (1) mirror the input pattern and (2) be sensitive to the pragmatic-semantic factors of passive constructions.

The purpose of the study is to investigate the comprehension of the two Danish passive constructions by 3-6 year old Danish acquiring children in order to test the three explanations towards why passive development is more difficult than active constructions and a late acquired morphological ability.

We first analyzed spontaneous production of passive constructions expressed by 19 children and their parents in order to obtain an index of the input factor. We then tested comprehension of active constructions, morphological passives and periphrastic passives by 50 Danish-speaking children aged 3-6 years (mean 4;7) in a picture matching experiment.

The results indicate that the passive constructions are infrequent in production; however the periphrastic passive is the more frequent of the two passive constructions. Danish children are significantly delayed in their comprehension of passive constructions compared to their comprehension of active constructions. Periphrastic passives, however, are comprehended significantly earlier than morphological passives. This acquisition pattern challenges the maturation hypothesis and the non-canonical structure hypothesis, as these would predict both types of passive constructions to be acquired in synchrony. The results support the input hypothesis, but suggest that pragmatic-semantic aspects also may play a role in Danish children's acquisition of passive constructi

P1-44

Using syntactic priming to investigate semantic and lexical factors in English speaking children's early passives

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There is conflicting evidence concerning the acquisition of the English passive. Some comprehension evidence suggests later acquisition (Bever, 1970) compared to evidence from novel-verb and syntactic priming studies which suggest relatively early acquisition (Brooks & Tomasello, 1999; Huttenlocher et al., 2004). Other evidence suggests a role for semantic and lexical influences; early use of the passive has been argued to be semantically constrained to action verbs (Maratsos et al, 1985), and young children perform better with *get*-passives than *be*-passives (Harris & Flora, 1982).

The study reported here used a syntactic priming paradigm to investigate semantic and lexical factors in 3- and 4-year-olds' (and adult controls') use of the English passive. Patterns of syntactic priming, the tendency to repeat syntactic structure across successive utterances (Bock, 1986), are informative about underlying syntactic representations (Branigan et al., 1995). Participants alternated with the experimenter in describing pictures of transitive actions. We manipulated the form of the experimenter's *prime* description, and examined whether this affected the form of the participant's *target* description.

Experiment 1 manipulated the structure (active vs passive) and verb-type (actional vs non-actional) of the prime description (1, 2); target pictures (4) showed an unrelated actional event. We found a reliable effect of structure, but no effect of verb-type: Children were 27% more likely to produce a passive description after hearing a passive rather than an active description, irrespective of whether the prime-verb was actional (34%) or non-actional (21%).

1a) a girl is being patted by a bear
1b) a girl is being frightened by a bear
2a) a bear is patting a girl
2b) a bear is frightening a girl
3) a girl is getting patted by a bear
4) a frog tickling a fairy

Experiment 2 compared priming following *be*-passives (1a), *get*-passives (3), and actives (2a). We examined priming effects for *get*-passive and *be*-passive responses separately; for both we found a reliable effect of prime-structure: Children were 42% more likely to produce a *get*-passive and 20% more likely to produce a *be*-passive after hearing a passive than after hearing an active. Pairwise comparisons showed that children were reliably more likely to produce a *get*-response following a *be*-passive than following an active, but not more likely to produce a *be*-response following a *get*-passive than following an active.

The results of Experiment 1 suggest that by 4, children have an abstract passive representation that is not linked to specific lexical items (priming occurred without lexical overlap between prime and target verbs) and furthermore that is not constrained by verb semantics (priming occurred from non-actional to actional verbs). The occurrence of priming from *be*-passives to *get*-passives in Experiment 2 suggests that this priming did not arise solely from lexical priming of the auxiliary. Moreover, it suggests 4-year-olds have a common representation that underlies *be*- and *get*-passives. However, the absence of reliable priming in the opposite direction suggests that the auxiliary plays an important role in the acquisition of the passive and supports Harris and Flora's (1982) finding that *get* is acquired earlier than *be*.

P1-45

Lexical and abstract components of noun phrase structure in young children: Evidence from syntactic priming

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There is strong evidence that adults tend to repeat abstract syntactic structure in language production: After producing or hearing a *prime* sentence with a particular structure, adults are more likely to use that structure in a subsequent, otherwise unrelated, *target* sentence (Bock, 1986; Branigan, Pickering, & Cleland, 2000). Such *syntactic priming* effects are taken as evidence that adult language production involves the retrieval and processing of abstract syntactic representations, which can be characterized as context-free constituent structures. But to what extent does young children's language production also involve such abstract representations? Some recent research suggests that young children's syntax is not abstract, but is instead strongly tied to specific lexical items (e.g., Tomasello, 2000).

We report two syntactic priming experiments that examined the production of noun phrase structure in 2-, 3- and 4-year olds. Under the guise of a game of 'snap', the experimenter and a participant alternately described picture cards depicting a colored object. On half of the experimental trials, the experimenter described her card using a determiner-adjective-noun (DAN) structure (e.g. *a blue cat*), and on the other half using a noun-relative clause (NRC) structure (e.g. *a cat that's blue*). The participant then described his card, before making a match/no-match ('snap') judgement. We examined whether participants repeated the structure of the experimenter's prime description in their target descriptions (e.g., *a yellow flower* vs *a flower that's yellow*).

Experiments 1 (3;3 - 4;11-year-olds and an adult control group) and 2 (2;8 - 3;7-year-olds) manipulated two factors: Prime structure (DAN vs. NRC) and the Head Noun in prime and target descriptions (Repeated vs. Different). If children use abstract syntactic representations, they should be more likely to produce the structure that they have just heard. Additionally, if children's syntax is initially tied to specific lexical items but gradually becomes more abstract, then this 'lexical boost' to the priming effect should be stronger in children than in adults, and in younger children than in older children.

Both experiments showed strong priming effects in both the Repeated- and Different-noun conditions (all ps < .05): Both children and adults produced more descriptions with the same structure that they had heard than with the alternative structure; this priming effect was reliably stronger in children than adults (see Table 1). Priming was stronger in both groups when the noun was repeated than when it was not repeated, but importantly, the magnitude of this lexical boost was comparable in children and adults, and in the younger and older children.

Our results provide striking evidence for abstract syntactic representations in children as young as 2;8 years. Moreover, these representations are shared between comprehension and production: merely hearing one exemplar of a structure increases the likelihood of then producing that structure. Most importantly, our experiments found no evidence for a developmental trend from item-based representations to abstract representations, suggesting that children develop highly abstract representations at a young age.

Table 1: Percentage of NRC Target descriptions by condition.

	Repeated Noun		Different Noun	
NRC Targets	DAN Prime	NRC Prime	DAN Prime	NRC Prime
Expmt 1:Children	0	74.8	6.5	58.5
Adults	0	27.0	1.1	8.8
Expmt 2:Children	0	75.6	0	41.7

P1-46

Age of acquisition effects in ergativity: Evidence from high-proficient native and non-native speakers

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1. Introduction. In the last decade, several studies ([1]) have shown that non-native speakers of varying AoAs process certain aspects of grammar differently from native speakers. We present the results of behavioural and Event-Related Brain potentials (ERP) study on ergative case processing in Basque. Our results show that natives and non-natives differ in the way in which they process ergative case morphology. Basque is a highly inflected ergative-absolutive (ERG)(ABS) language with overt case morphology (1):

1. Goiz-ean ogi-a erosi d-u-t *ni-k* denda-n.
'morning-in bread-ABS bought it-have-I *I-ERG* shop-in'
(=This morning *I (ERG)* bought bread (ABS) in the shop)

In (1), the subject of the clause *ni* 'I' bears the ergative *–k* case marker. Previous ERP studies on nominative-accusative languages ([2]) have shown that case violations elicit a centro-parietal positivity (P600) in 500-800 ms time window, usually preceded by a Left Anterior Negativity (LAN) component in 300-500 ms time window. Basque provides us with the opportunity to test whether these effects hold in ergative systems ([3]) as well.

2. Methods & Materials. 17 native Basque speakers and 17 non-native high-proficient Basque-Spanish bilinguals (AoA 3 years) participated in the ERP study. Subjects were presented with various types of grammatical violations, one of them an ergative case violation, such as (2).

2. Goiz-ean ogi-a erosi d-u-t **ni* denda-n.
'morning-in bread-ABS bought it-have-I **I* shop-in'
(=This morning **I* bought the bread (ABS) in the shop)

In this experimental condition, the sentence presents an OVS order, (grammatical in Basque) to ensure that both the violation and disambiguation points coincide in the sequence. In (2) the subject 'I' is missing the ergative marker (*–k*), yielding ungrammaticality.

3. Results. For ergative case violations, the native group displayed a central negativity in 300-500 ms time window (statistically almost significant) followed by a centro-parietal positivity in 600-800 ms time window (P600), whereas the non-native group only displayed a central negativity (statistically almost significant). No late centro-parietal positivity was observed in the latter group. Despite their high proficiency, non-natives made significantly more errors than natives in the behavioural task.

4. Discussion. Absence of a P600 component as response to ergative case violations among non-native high-proficient speakers indicates a difference in grammatical processing by these two populations. This leads us to conclude that AoA plays a significant role in the acquisition of ergative case morphology, and thus presumably in the acquisition of ergativity as a typological trait. Our results thus converge with previous findings showing that certain aspects of grammatical structure are influenced by AoA.

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P1-47

Social knowledge contextualizes the initial learning of a new word order

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Speakers of multiple languages typically select word orders and syntactic structures that are appropriate for the languages that their interlocutors understand. This knowledge of the language capabilities of one's interlocutor is a type of social knowledge and the relationship between this social knowledge and language-specific word orders must be learned. To examine how children learn to link this social knowledge and word order, we manipulated the language abilities of a child's interlocutor within an experimental paradigm that required a child to learn a new word order (called the weird word order or WWO) and generalize it to novel arguments (Akhtar, 1999).

In the first study, Japanese children were taught the WWO for commanding a robot dog to point or look for stickers that were hidden in the room. At test, children were encouraged to command the robot to search for a set of stickers, but they could use either the WWO or the Japanese order. We used three contexts to manipulate the language abilities of the child's interlocutor. In the WWO-only context, the child interacted with a robot that only understood the WWO language. To see if the child's knowledge of the robot abilities was critical, we created a Bilingual context, which was identical to the WWO-context except that the robot was first shown to understand a few Japanese phrases (with verbs other than point or look). And to compare our results with the earlier studies, we had a Shared condition, where the child's interlocutor was the Japanese experimenter, who prompted the Japanese child to describe the action using their shared language.

Although our task differed from earlier WWO studies, we replicated earlier findings that 4-year old children are reluctant to use a WWO when talking to someone who shares their same native language (in the Shared condition, no WWO utterances were produced). But in the WWO-only condition, 4-year-olds used the WWO on average 10.6 times per child (out of 12). And in the Bilingual condition, they used significantly fewer WWO-only utterances (average 5.4/child). These results suggest that the children were sensitive to the language abilities of their interlocutor and this social knowledge could influence the initial learning of a new word order.

In the second study, we examined how age and verb familiarity influenced children within the WWO-only paradigm. Previous work suggested that there was a positive relationship between age and verb familiarity/frequency in the use of the canonical order of the child's native language (Abbot-Smith, Lieven, & Tomasello, 2001; Akhtar, 1999; Matthews, Lieven, Theakston, & Tomasello, 2005). When we tested 3- and 4-year-olds with both novel and familiar verbs in the WWO-only condition, we found no improvement in the use of canonical order over age or verb/familiarity, but we did find a significant improvement in the use of the WWO over age. We suggest that these results and the earlier results are compatible if the ability to learn and generalize a new word order is contextualized by social factors from the beginning of acquisition.

P1-48

Children's comprehension of passives in Mandarin Chinese

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Children's acquisition of passives has attracted acquisitionists for decades, for the passive structure not only raises interesting issues for linguistic theories but also provides a window to investigate the relation between language and cognition. Children's delayed acquisition of passives and the asymmetry between children's comprehension of passives with actional verbs and those with psychological verbs in English have been widely reported and received various interpretations (Maratsos et al., 1985, Borer & Wexler, 1987, Fox & Grodzinsky, 1998, Wexler, 2004). However, little is known about children's acquisition of passives in Mandarin Chinese, which are argued to go through different syntactic derivations from English, with long passives involving null-operator movement and short passives A-movement (Huang, 1999). It thus might be interesting to investigate how acquisition of Chinese passives is similar to or different from acquisition of passives in other languages. This study explores children's comprehension of passives in Mandarin Chinese, hoping to get a better understanding of universal as well as language-specific properties of passives in language development.

48 Mandarin-speaking children aged 4 to 6 are tested in a picture identification task to see whether and how the following factors influence children's comprehension of Chinese passives: long vs. short passives, actional verbs vs. psychological verbs, the affectedness of the logical object. Verbs in the test sentences fall into four categories: monosyllabic actional verbs (e.g. *da*, 'hit'), resulatative actional verb compounds (e.g. *ti-dao*, 'kick over'), object-experiencer (OE) psychological verbs (e.g. *xia-huai*, 'scare to death') and subject-experiencer (SE) psychological verbs (e.g. *kan-jian*, 'see'). Test sentences include actives (e.g. *Xiaomao da le xiaogou*. 'The little cat hit the little dog.'), BA constructions (e.g *Xiaomao ba xiaogou da le*. 'The little cat hit the little dog.'), short passives (e.g *Xiaomao bei da le*. 'The little cat was hit.'), long passives (e.g. *Xiaomao bei xiaogou da le*. 'The little cat was hit by the little dog.') and pseudo passives (e.g. *Xiaomao xiahuai le*. 'The little cat was frightened.').

Preliminary results show that children before 6 have more difficulty with long passives than short passives. Besides, similar to English, children perform better on passives with actional verbs (e.g. *da*, 'hit') than those with SE psychological verbs (e.g. *kan-jian*, 'see'). Yet such asymmetry is not observed for active and BA constructions.. Surprisingly, in contrast with other three types of verbs, children's understanding of sentences with OE verbs (e.g. *xia-huai*, 'scare') displays reversible patterns: children perform well on the passives with OE verbs but have problems with their active and BA counterparts. We will discuss these findings in terms of input frequencies as well as syntactic and semantic properties of the different types of verbs.

P1-49

Cantonese children's processing of relative clauses: Cross-linguistic comparisons with English and German children

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We adapted the sentence repetition task used in Diessel & Tomasello (2005) with monolingual German and English children to their age peers (aged 4;3-4;9, N=21) acquiring Cantonese relative clauses (RC). Sentence stimuli were manipulated for (i) the construction of the main clause (transitive main clause versus copular main clause); and (ii) the position of the head NP being relativized (Subject (S), Agent (A), Patient (P), Indirect Object (IO), Oblique (OBL) and Genitive(GEN)), and controlled for length and semantic factors.

The processing of Cantonese RCs presents an interesting case for cross-linguistic comparisons in acquisition, because the structure of Cantonese RCs (Matthews & Yip, 2001) exhibits a number of characteristics that are relevant to various theoretical proposals:

(i) Processing Cantonese subject- (S-/A-) versus object- (P-) relatives involves a competition of processing factors, while languages like German and English with post-nominal relatives would not encounter such a competition. The processing factors governing the Noun Phrase Accessibility Hierarchy (Keenan & Comrie, 1977) would universally favour processing subject over object relatives across languages, as object relatives are positioned lower than subject relatives in the hierarchy. On the other hand, the processing factors involved in the 'structural similarity hypothesis' (Diessel & Tomasello, 2005), which depends on the configurational details of the target language, would facilitate the processing of object- but not subject- relatives in Cantonese, because relativizing the object position in Cantonese preserves the main clause SVO word order:

Obj RC: **[RC** daai6ban6zoeng6 teoi1 __] **go2 zek3 ngau4ngau2** zong6 dou2 go3 neoi5zai2
[elephant push **]** **that CL cow** hit PART CL girl
'**The cow** **[RC** that the elephant pushed __] hit the girl.'

(ii) The difficult distinction between attributive clauses and relative clauses in East Asian languages is also relevant here (Comrie, 1998)

Our results indicate that similar to Diessel & Tomasello's (2005) German- and English- speaking children, Cantonese children also found RCs with a copula main clause easier to imitate than RCs with a transitive main clause. This finding is consistent with the idea that sentences consisting of a copula clause and a RC are semantically less complex. However, unlike their English and German age peers, Cantonese children did not exhibit a subject- over object- RC advantage. This finding accord with the multi-factorial perspective (Diessel & Tomasello, 2005; Comrie, 2007; Hawkins, 2007): when the processing factors underlying the language universal and specific principles interact and pull in different directions, the final outcome could vary in different language types. The finding also lends support to Comrie (1998)'s typological proposal and Ozeki & Shirai (2007)'s Japanese child findings: since RCs in certain East Asian languages can be considered a subset of attributive clauses involving no syntactic operation such as gap or movement, the processing of RCs in these languages should not be influenced by the grammatical relations between the head NP and the RC. Error analyses reveal two major patterns. First, certain non-target productions, although they differ in their error types (e.g. conversion to a serial verb clause, omission of the resumptive pronoun, non-target repetitions that are consistent with an internal headed relative clause analysis), often share the common feature of having the simple sentence structure preserved. Such errors might exemplify the role of simple sentences in the processing and acquisition of Cantonese relative clauses. Second, whether the complex sentence is 'constructable' by subpart constructions or not solicits different patterns of errors, possibly suggesting the activation of different related constructions in the network of constructions (Goldberg, 1995).

P1-50

Structural biases in acquisition: Evidence from miniature language learning

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Natural languages do not vary arbitrarily, but rather are constrained so that various structural devices reoccur across the languages of the world. One constraint which appears to hold in *all* languages is the principle of *Structure Dependence***,** i.e., languages organize words into phrases*,* and linguistic operations make reference to these phrases. A possibility for language development is that learners may be *biased* to expect languages to adhere to this architectural principle. Singleton and Newport (Singleton 1989; Newport 1999) found evidence for this in the language development of a deaf child, 'Simon', whose only language input was the impoverished ASL signed by his late-learner parents. Simon was found to be able to correctly interpret certain topicalized sentence structures which his parents were *not* able to interpret, and which could therefore be presumed to be missing from his input. Newport and Singleton suggest that Simon had acquired the basic phrase structure of ASL from his input and was able to use the principle of Structure Dependence to determine the interpretation of the missing topicalized forms.

The current study further explores the interpretation of novel sentence structures using *Artificial Language Learning*. An artificial language was created which replicated aspects of Simon's linguistic environment, although it was spoken rather than signed. Adult and child participants (7-8 year olds) learned the language by hearing sentences and viewing accompanying scenes which provided the semantics. Like ASL, the language had a basic SVO word order (e.g. sentence: *blergen glim flugat*; gloss: LION HIT BEE), but also allowed various topicalized forms, including the structure **VO**,S (e.g. *glim flugat, blergen,* HIT BEE, LION). In order to mimic Simon's input, no sentences with this latter word order were included in the set of sentences presented during learning, but such sentences *were* included in a final Comprehension Test. In this test, learners heard a sentence and viewed two scenes. One of these scenes corresponded to the 'correct' **VO**,S word order and the other to the 'incorrect' **VS**,O word order. For example the participant might hear "*glim flugat, blergen"* (HIT BEE, LION) whilst viewing the scenes 'lion-hits-bee' (i.e. VO,S) and 'bee-hits-lion' (VS,O). Note that neither of these possible sentence structures had occurred in the input. However, if Singleton & Newport's hypothesis is correct, learners should be able to use the principle of structure dependence to recognize the **VO**,S structure *provided they have independently acquired a S[VO] phrasal grouping*. To explore this hypothesis, we further manipulated the input to learning such that half of the adults and half of the children received cues to phrase structure (certain sentences contained a prosodic break indicating a [VO] grouping). The remaining learners were exposed to a language with *no* cues to phrase structure. The results showed that only the first group of learners were able to correctly identify the VO,S word order.

We conclude that, provided they have learned the underlying phrase structure, adult and child learners are able to use the architectural principle of Structure Dependence to interpret novel sentence structures.

P1-51

When do familiar verbs make a sentence harder to understand?

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A number of studies have found that young two-year-olds are initially able to use and understand the active transitive construction with familiar verbs but show great difficulty in generalising this to novel verbs (see e.g. Tomasello, 2003, for a review). A usage-based interpretation is that productivity with the active transitive depends on the number of active transitive sentences the child has previously heard or used. One alternative interpretation is however, that familiar verbs are highly activated, thus facilitating the task (Fisher, 2002). Another alternative argument is that children might interpret novel verbs differently from how the experimenter intended, e.g. as non-causative verbs (Naigles, 2002). Both of these latter explanations would predict that two-year-olds should always perform better with familiar than with novel verbs. In contrast, usage-based accounts predict that performance with novel verbs may be equivalent to that with familiar verbs once the child has mastered the target construction. Further, it would predict that if the particular familiar verbs used have stronger associations with an alternative construction, children might actually show worse performance with familiar than with novel verbs in the target construction.

To test this, we examined comprehension of the German full eventive passive by 2;3-year-olds, 2;7-year-olds, 3;7-year-olds and 4;7-year-olds (N = 24 in each age group). There were two within-subjects conditions (familiar versus novel verbs). In the familiar verb condition the three test sentences contained “schubsen” (*push/shove)*, “waschen” (*wash*) and “kaemmen” (*comb/brush*). All familiar and novel verbs were either change-of-state or change-of-location of the patient. In the test phases, the children saw two simultaneous videos (e.g. one with the bear pushing the lion and the other with the lion pushing the bear) and heard e.g. "Guck mal, der Bär wird vom Löwen geschubst" (*look, the bear is being pushed by the lion*). Then, after the videos stopped the experimenter asked the child to point to the correct still picture (e.g. "Zeig mir: wo wurde der Bär vom Löwen geschubst." '*Show me: where was the bear+NOM pushed by-the+DATIVE lion+DATIVE*').

The key findings were firstly, that the 4;7-year-olds pointed significantly above chance to the correct video scene, showing no significant differences between novel and familiar verb condition. Secondly, the 2;7-year-olds, were at chance in the novel verb condition but significantly below chance in the familiar verb condition. This indicates that the familiar verbs were so entrenched in the active transitive construction that the 2;7-year-olds preferred to interpret sentences containing these verbs as active (whereas they had no such bias with novel verbs).

P1-52

Animacy in early transitives: A study of spontaneous child productions

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Animacy is an important factor in child language acquisition. A number of studies have shown that young children (1) expect subjects of transitives to be animate (+An), (2) have difficulty comprehending transitives with inanimate (-An) subjects, and (3) produce most of their transitives with +An subjects and -An objects. These findings are consonant with the cognitive-based hypothesis that children begin producing transitives with +An subjects (the prototypical case for transitives) and only later add -An subjects (see work by Slobin, Corrigan, Schlesinger and others). This prediction, however, has not been tested directly; and information about the timing and nature of -An subject transitives in child speech, if they occur at all, has gone undocumented. The current study provides a detailed investigation of early child and child-directed transitives. In particular, the earliest productions (<3;4) of 20 transitive verbs were extracted from four American-English corpora in the CHILDES database. All the child and parent utterances containing these verbs were then coded and analyzed with respect to animacy. The results indicate that even children as young as 2;0 spontaneously produce some transitives with -An subjects. Although the frequency of these transitives is low, it is not categorically lower than the frequency in the child’s input or in the child’s later uses of the given verb. Moreover, some of the verbs studied were used in transitives with -An subjects earlier than with +An subjects, and individual differences were found regarding which verbs demonstrated this pattern. Furthermore, some of the earliest of all two-argument productions in the transcripts involved -An subjects. In essence, longitudinal production data do not support the claim that uses of transitive verbs emerge first with +An subjects and are only later extended to include -An subjects. This study also reveals that the semantic types of -An subjects in early child transitives are the same as those found in the input. Like their parents, children use natural forces, objects both with and without self-propelled motion, events, and body parts as subjects of transitives. Individual differences in the types of –An subjects also emerged among the children and reflected patterns in the input. Together, these results suggest that a verb-by-verb input-based account may best capture the distribution of -An subject transitives in early child speech.

P1-53

The functional basis of children's early multiword constructions: Evidence from Irish and English child directed speech

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Over the years a number of researchers have claimed that children's early linguistic constructions are tied very strongly to pragmatic function (e.g. Bates, 1976; Bloom, 1970; Bruner, 1975; Halliday, 1975; Snow 1979; Ninio, 1992). The present study evaluates the role of form-function patterns in the input during the development of early multiword constructions in the speech of one Irish-speaking child and one English-speaking child We adopt the usage-based approach to language development in which it is claimed that children's early multiword speech is lexically-based and directly related to the frequency of lexically-based patterns in the speech of their caregivers (e.g. Lieven et. al., 1997; Tomasello, 2003; Dabrowska, 2000; Theakston et. al., 2001).

The study focuses on the speech of an Irish-speaking mother and child, and an English-speaking mother and child during daily activities at home. The input sample consisted of three hours of recording for each mother. Two samples consisting of two hours of speech were analysed for each of the children; the first sample was taken from the onset of multiword speech (aged 1;8 for the Irish child, and 2;1 for the English child) and the second sample was taken three months later. The data were transcribed into CHAT format by trained transcribers and coded for pragmatic function using the Inventory of Communicative Acts (Ninio et. al., 1994).

We identified the types of pragmatic functions used within the samples and then conducted a lexical frame analysis on utterances found in the most frequently occurring pragmatic functions. The results from the input analysis were compared with the children's samples in order to ascertain the relationship between form and function in each of the two languages.

The results of the pragmatic analysis indicated a strong similarity in the functions found in the speech of the two mothers. Much of the discourse focussed on the 'here and now' although our study also indicated the prevalence of repetitions, imitations and recasts in

the speech of the mothers. The frame analysis conducted on the input sample indicated a high degree of lexical specificity within each function. Analysis of the children's data reflected the form-function patterns attested in the input with the gradual emergence of function-specific frames. The characteristics of the frames attested in the children's speech indicated both language-specific features but also more general characteristics which suggest that both children use similar methods of segmentation on their respective linguistic input.

We suggest that in the early stages of language development children produce function-specific frames which are extracted from the linguistic input. Initially the children's utterances may only comprise of segments taken from input frames but as development continues the utterances become more complex and bear a strong resemblance to lexically and function-based frames attested in the input.

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P1-54

Comprehension of argument structure: Evidence from infants and the preferential looking paradigm

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Studies using the preferential looking paradigm have shown that children can deduce the meaning of transitive and intransitive sentences containing novel verbs by using their syntax (e.g. Naigles, 1990). However the nature of the knowledge that underlies these abilities is unclear.

This paper presents a series of preferential looking studies designed to investigate the processes that underlie young children's understanding of verb argument structure.. Study one replicated the findings of Naigles (1990); The results show that the children (aged 2;0 and 2;6) could distinguish between intransitive sentences such as "the bunny and the duck are glorping" (which prompted a shift in looking towards a non-causal scene) and transitive sentences such as "the bunny is glorping the duck" (which prompted a shift in looking towards a causal scene).

Study two investigated the link between performance on the preferential looking task and a child's comprehension vocabulary. Previous studies (e.g. Gertner, Fisher and Eisengart, 2006) have reported no correlation between performance on the preferential looking task and vocabulary knowledge, indicating that a child's understanding of verb argument structure is not sensitive to their level of lexical knowledge. However, these studies focussed on measures of productive vocabulary, which may not be appropriate given that the IPL study is reliant on children's understanding (not production) of syntactic structure. The parents of the children who took part in study one completed the Oxford Communicative Development Inventory (a UK adaptation of the MacArthur CDI). The results indicated a strong positive relationship between receptive vocabulary and performance on the IPL task; indicating that children with bigger receptive vocabularies were more likely to succeed on the task.

Study three was designed to investigate what cues in the speech stream children use to succeed on the IPL task. Hirsh-Pasek and Golinkoff (1996) found that young children may be sensitive to auxiliary identity; with poor performance on the IPL task when auxiliaries are omitted (e.g. watch BB glorping CM). Study three investigated whether children can interpret sentences accurately if the only cue to meaning is the number (*is* vs. *are*) of the auxiliary form. Children (aged 2;1 and 2;6) were presented with two visual stimuli; one showing a single sheep jumping (and another sheep standing) and one showing two sheep jumping. The audio stimuli asked them either to "look at where the sheep are dancing" or "look at where the sheep is dancing". Results indicate that two year old children are able to interpret sentences on the basis of auxiliary identity alone. Study four presents preliminary results that suggest that the removal of the cue of auxiliary identity significantly affects children's ability to use syntactic structure (transitive vs. intransitive) to interpret simple causal and non-causal scenes.

The implications of these studies for nativist and constructivist theories of verb learning and the acquisition of syntax are discussed.

P1-55

Specificity vs. generality in the verb lexicon of Hebrew speaking children

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The role of semantic generality in the acquisition of children's early verb lexicon has been a major area of investigation in the passing decade. While some researchers argue that semantically general verbs *(*e.g., *be, do, make, get, go, come, put, give, take* and *bring*) are acquired early and play a major role in the early acquisition of argument structure (Bowerman 1990, Clark 1978, 1993, 1995 Goldberg 1998, Hollebrandse & Van Hoot 1995, 1996, Ninio 1999, 2004, Pinker 1989), others argue that early on, children rely primarily on semantically specific verbs (P. Brown 1997, 1998). The present study examines whether early verb learning is general or specific using data from child Hebrew.

To this end, a meta-analysis was performed on longitudinal data reported in four major studies on the development of Hebrew verbs: Armon-Lotem and Berman (2003), Dromi (1987), Ninio (1999), Ravid (1997). Lists of the first verbs acquired by 7 Hebrew-speaking children, ages 1;2-2;4, reported in these studies were compiled and coded for semantic specificity by two independent coders.

Inter-rater reliability was 90% (a total of 186 verb-types). A meta-analysis has several methodological advantages as it provides a broad perspective on the early verb lexicon of Hebrew-speaking children, it gets around the problem of confusing frequency with early acquisition (Tomasello & Stahl 2004) by quantifying over verb types rather than tokens, and it uses type-sharing rather than frequency to determine children's early preferences. Based on prior research on lexical composition among adults and children, three levels of specificity were identified (Berman & Armon-Lotem 2003, Bloom 1993, Clark 1993, Talmy 1985, Slobin 1981, 1985, 1997): (1) general purpose verbs like *hlx1* 'go, walk', *isy1* 'do, make',*ntn1* 'give', and *sym1* 'put'; (2) basic verbs like *akl1* 'eat', *gmr1* 'finish', *npl1* 'fall', *ptx1* 'open', *rcy1* 'want', and *yrd1* 'get down'; and (3) specific verbs like *qlp3* 'peel', *asp1* 'collect', *glgl1* 'roll+TR', *glx3* 'shave+TR', *xba4* 'hide', and *iwp1* 'fly+ INTR'.

The following findings emerge from the data: (1) the types of verbs most often shared by children across the different studies are "general purpose" and "basic" verbs rather than "specific" ones (7-4 children vs. 3-1, respectively). (2) Unlike "specific" verbs, "general purpose" verbs were also most often shared by children within a particular study (Armon-Lotem and Berman' three children, Ravid's twins); (3) the greatest differentiation in children's lexicons occurred in the use of "specific" verbs.

These findings suggest that although the early lexicon of Hebrew-speaking children includes both semantically specific and general verbs, early on, "general purpose" verbs play a more central role in acquisition. The discussion will elaborate on the possible reasons for this differentiation, considering factors like verb properties (e.g., use as main V vs. Aux, transitivity), language typology (verb- vs. satellite-framed) and the role of input (distribution, nature of dyadic interaction), offering a broad view of early verb learning that embraces a multi-faceted approach to the process (cf. Berman 1993a, Hirsh-Pasek & Golinkoff 1996, Maratsos & Chalkley 1981, Shatz 1987, Uziel-Karl 2001).

P2-1

Code-switching in narrative story-completion tasks in Mexican-heritage preschoolers

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Background and aims: Code-switching, a person's use of two languages in the same conversation, demonstrates the flexibility and versatility of human speech (Broresma & De Bot, 2006). The simplest explanation for code-switching may be gaps in lexical knowledge. However, research has shown that more complex factors may be at play, such as the desire for greater communicative power and social bonding (Zentella, 1997). The current study's purpose is to explore code-switching usage in a sample of bilingual Mexican-heritage preschoolers in the United States and the possible motivations behind these switches.

Methods: 91 children (52% female), enrolled in state-funded preschools in a large urban area, were drawn from a larger study looking at parenting in Mexican-heritage families. 72% of the children were first-generation immigrants born in Mexico or Guatemala, having moved to the US prior to the study. Spanish was the primary language in 82% of the homes. When children were 54 months, bilingual interviewers administered the Attachment Story Completion Task (ASCT; Bretherton, Ridgeway, & Cassidy, 1990), consisting of narrative prompts about activities involving the child and mother and the child and preschool teacher. 58 of the children primarily used Spanish during the task and 33 English. A coding scheme was adapted from Zentella's (1997) framework, identifying two major categories of switches: Borrowings, seemingly unintentional switches due to a lexical gap, and Purposeful Switches, seemingly intentional switches either for realigning speech with or clarifying speech for the interviewer.

Results: Fifty Spanish-dominant children and four English-dominant children engaged in code-switching. Spanish-dominant children engaged in a total of 494 switches. The average number of switches per story stem was slightly higher for child-teacher story stems (M = .85, SD = 1.47) than for child-mother story stems (M = .73, SD = .60). Children at this age were more likely to use Borrowings (n = 302) rather than Purposeful Switches (n = 75). When employing Borrowings; children most frequently code-switched when shifting roles in child-mother story stems but most frequently code-switched when quoting dialogue in child-teacher story stems. English-dominant children engaged in a total of just 15 switches. There were an average of 1.25 (SD = 1.26) switches, primarily Borrowings, per child per child-mother story stem, and no switches during child-teacher story stems.

Conclusions: Results reveal that preschool-aged children were more likely code-switch due to lexical gaps rather than for a particular conversational strategy, unlike older children who more often strategically code-switched (Zentella, 1997). There is evidence that these preschool children were beginning to purposefully code-switch, suggesting a developmental trajectory for code-switching. Spanish-dominant children were also more likely to code-switch than their English-dominant counterparts, due perhaps to their viewing interviewers in a teacher-like role akin to school-related authority figures, such as their teachers, who are associated with the English-speaking preschool context. This is further evidenced by these Spanish-dominant children's more frequent code-switching during child-teacher story stems. For children who are being raised in two linguistic worlds, code-switching might serve as an outward manifestation of the contrasting demands placed upon them as they not only acquire language, but also how to navigate multiple languages and social contexts.

P2-2

A comparison of the verbal justifications in the conversations of middle-school children with their parents and with their peers

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In negotiating the social world, adults often give verbal justifications for their actions or thoughts while making inferences about the beliefs of others. Numerous studies have found that the number of children's justifications in conflicts steadily increases during the preschool years. The majority of these studies have looked at children's justifications in conversations with their parents. Children's conversations with their peers are another likely place for children to learn the cognitive and linguistic skills involved in the discourse of verbal justifications, but since peers are more equal in power, their uses of justifications may differ from justifications in a parent-child interaction.

This study compares the verbal justifications in conversations between middle-school children and one parent to the verbal justifications they produce in conversation with a peer. Two different contexts for the conversations were used to determine whether the type of conversation would also affect their verbal justifications.

Twenty children were recorded (ten for each type of task) with both their parent and a friend for 20 minutes. Half of these children were merely given paper and markers and asked to talk or draw freely. The other half were asked to think of various people and agree on a word describing each of these people. The number of justifications per utterance was calculated, and these justifications were then coded for their discourse context. The transcripts were also analyzed for sequences of justifications.

The peer dyads gave more justifications per utterance in the free-language task than the parent-child dyads; in contrast, parent-child dyads gave more justifications per utterance than the peer dyads in the more formal task. More sequences of justifications were found in the parent-child dyads for both types of task. These differences indicate that middle-school children gain different experience in

justifications and argumentation from their conversations with their parents compared to those with their peers. They use more justifications with their peers in free play, and these justifications are more often in the context of conflicts. Their parents, however, produce more justifications in a task that requires discussion and an agreed-upon result; they also produce more sequences of justifications in which the children gain the ability for sustained argument.

P2-3

"*He was angry and I don't know why.*" Children's early understanding of complex emotion and its manifestation within storybook narration

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Research on the development of children's third-person narratives suggests that, between the ages of 5- to 8-years, children differ in their distribution of evaluative utterances (including references to emotion and mental states), with younger children evaluating local details, and older children providing global evaluations (Bamberg & Damrad-Frye, 1991). These findings have not been integrated with a vast literature on the development of socio-cognitive understanding, which documents an emerging understanding of complex mental states and emotion during this time period. Specifically, children begin to acquire their understanding of various aspects of complex emotions during the age range of 5- to 8-years (Pons, Harris, & de Rosnay, 2004). In what way children acquire concepts of complex emotions, however, has been debated.

The present study is the first to provide a comprehensive analysis of varieties of evaluative language in 5- to 8-year-olds' third-person narratives and to examine how development in their use relates to age-related changes in the episodic structure of children's narratives, and also to socio-cognitive understanding. Younger (N = 22, 5/6-year-olds) and older (N = 25, 7/8-year-olds) children generated a fictional narrative using a wordless picture book, *One Frog Too Many*, about a frog experiencing jealousy when his family acquires an additional frog. Additionally, children's socio-cognitive understanding was assessed using a test of emotion comprehension (TEC). The narratives were coded for labels and explanations of emotions and mental states, their distribution within the episodic structure of the story, and were coded along dimensions of narrative skill (including the ability to infer the underlying jealousy theme). Analyses revealed older children scored higher on the TEC and combined narrative measure, and used more references to story resolution, than did their younger counterparts. Furthermore, children's general language ability, narrative skill, and references to story resolution were significantly correlated with TEC scores. Although no age differences were found in the numbers of emotion labels and explanations produced, children were more likely to use emotion explanations than emotion labels and girls were found to use more emotion explanations than boys. Also, older children referenced mental states more than did younger children, and girls more so than boys. The distribution of evaluative utterances suggested that younger children used emotion language when a character's facial expression was in accord with the actions taking place immediately prior to the expression. The older children were better able to relate emotion talk to the story as a whole, providing their audience with a more global evaluation of the story. Additionally, older children were more likely to refer to an emotional theme than younger children. Moreover, only older children attributed the complex emotion of "jealousy" to the theme of the story, whereas younger children referred solely to the basic emotion of "anger". This pattern suggests that younger children in this age range continue to rely on story characters' facial expressions in understanding a complex emotional theme. The present study provides further support of the intricacies associated with children's ongoing development of complex emotion understanding between the ages of 5 and 8.

P2-4

Narrative components and cohesive devices in fantasy narratives, personal narratives, and scripts: A developmental study of Mandarin-speaking children in Taiwan

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This study aims to explore narrative development in Mandarin-speaking children in Taiwan, with special focus on children's narrative performance across genres. Prior research on narrative development in Mandarin-speaking children has only focused on one narrative genre. Variations in content, structure, and linguistic features, however, were observed in different narrative genres produced by English-speaking children.

Three age groups of children, age 3 (N=18), age 5 (N=19), and age 8 (N= 20), were recruited to join this study, with the mean ages of 3;8, 5;8, and 8;0 for each group respectively. Each child was asked to produce fantasy narratives, personal narratives, and scripts about four events. The data were transcribed and coded using the CHILDES system and a set of statistical analyses (one way ANOVA, repeated measures ANOVA, and post-hoc tests) were performed to test for differences in children's narrative performance. Two dimensions of narrative skill, narrative components (action, evaluation, duration, speech, and closing) and cohesive devices (adverbs/adverbial phrases, causal conjunctions, optional connectives, simple conjunctions, sequencers, and temporal conjunctions) were coded and analyzed. Inter-rater agreements were over 94% for both coding systems in each genre.

Primary results of this study were summarized as follows:

1. With respect to effect of genre on narrative components, statistical significance was observed in a number of narrative components, including (1) action in age group 3, (2) action, durative, and evaluation in age group 5, and (3) action, evaluation and direct speech in age group 8. Post-hoc tests showed that the mean frequencies of action and evaluation talk in scripts were significantly lower than those in fantasy narratives; the mean frequency of durative talk was significantly higher in personal narratives than those in scripts and fantasy narratives; the occurrence of direct speech was significantly greater in fantasy narratives than those in personal narratives and scripts. These findings suggest clear developmental differences in children's ability in distinguishing narrative genres.
2. With respect to cohesive devices, the effect of genre was also observed. Significant differences were evident in (1) proportion of sequencers and total number of cohesive devices in age 3, (2) proportion of sequencers, proportion of temporal connectives, and total number of cohesive devices in age 5, and (3) proportions of adverbs/adverbial phrases, causal conjunctions, optional connectives, simple conjunctions, sequencers, temporal conjunctions and total number of cohesive devices in age 8. Except optional connectives, significantly more proportions of cohesive devices produced by the eight-year-olds occurred in fantasy narratives than those in personal narratives and scripts. A significantly larger proportion of optional connectives was evident in scripts.

Mandarin has no tense markers and zero anaphors can be used in contexts where a referent can be understood by the hearer. Results of this study imply that although Mandarin is different from English in the actual linguistic devices to distinguish the features of narrative genres, Mandarin-speaking children show evidence of the ability to differentiate types of narratives. Educational implications of this study and suggestions for the future research were provided.

P2-5

Conversation as a way to improve 5 to 10-year old children's stories

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The acquisition of narrative skills is a developmental process that takes many years. Although children as young as 4-5 years can produce descriptive narratives, they have difficulties with explaining events, particularly when they involve the internal states of the characters. These explanations need that children take not only the perspective of a narrator but also that of the characters. This is even more the case when children attribute explicitly to the characters beliefs, let know that their beliefs may be false or rectify them.

Can children produce more complex mind-oriented narratives after participating in conversations that solicit children's attention on the reasons of the central events in a story?.

This question was investigated by presenting a sequence of five wordless pictures (the "stone story") to 120 French-speaking children aged 5 to 10 years, divided into six age groups of 20 children each.

All children were first requested to tell the experimenter the story they understood after the set of pictures, presented sequentially on a computer's screen, had faded out (*first narrative*). Then, for half of the children (the conversational scaffolding group), the experimenter asked questions soliciting the reasons of the key events in the story. The other half (the control group) played a memory game including the pictures of the story, devised in an earlier study. Finally, all children were asked to narrate once again the story *(second narrative)*. The interviews were audio-recorded and transcribed *verbatim*.

The analysis focused on children's explanations of events, distinguishing physical from psychological explanations, and on the expression of false beliefs and of their repairs, using both linguistic and discursive criteria to identify them.

Preliminary results show that the particular story used in this research - whose central point is a misunderstanding between two characters – did not promote young children's evaluative attitude nor their ability to narrate the story by taking into account the psychological perspective of the characters. From age six on, the interaction between the experimenter and the child brought children of the conversational scaffolding group to improve the evaluative components of their second narrative. Improvements were significantly superior to those observed in the second narratives produced by the children of the control group. Results will be discussed in the light of a vygokskian developmental perspective.

P2-6

Narrative structures in L1 and L2: What's the difference?

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A vast number of linguistic studies have dealt with narratives – for different purposes and from different perspectives. Nevertheless, research about the development of storytelling abilities in an L2, and especially in immersion programs, is scarce. In my paper, I will take a look at the development of elementary school children in an English immersion project in northern Germany, where children with L1 German are taught 70% of the curriculum in the L2 English- everything besides German language classes.

Storytelling abilities are a good indicator of cognitive and linguistic development. My approach is to trace the immersion children's development from grade one to four by looking at the coherence and cohesion of their story productions. Narrative coherence is evident in the stories' narrative organization and reflects the development of the children's cognitive abilities (e.g. Graesser et al. 2004, Berman 2001, Shapiro & Hudson 1997). The children's use of cohesive devices (personal and demonstrative reference, connectives), on the other hand, gives evidence of the development of their linguistic abilities.

This study combines longitudinal and cross-sectional data collected with the help of the picture book "Frog, where are you?" (Mayer 1969), i.e. a picture-elicited storytelling task. Longitudinal L2 English data (N= 17) was collected at age 6;8, i.e. after one year of exposure to English IM (end of grade 1 in German elementary schools) and at age 9;8, i.e. after four years of exposure (end of German elementary school). Cross-sectional L2 English and L1 German data was collected for the same ages: 6;8 (N= 18) and 9;8 (N= 15). Additionally, information on storytelling in the homes was obtained for the children participating in the cross-sectional part of the study.

The following research questions are addressed in my study:

(1) Is there an age-related difference in the number of narrative components (personal references/ demonstrative references/ connectives) in the IM students' L2 English? In their L1 German?

(2) Is there a difference in the number of narrative components (personal references/ demonstrative references/ connectives) between the IM students' L1 German and their L2 English?

The structure of my paper will be the following: After giving a brief overview of the immersion project and the methodology used to assess the children's narratives, I will focus on the comparison of the results obtained for L1 and L2.

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P2-7

Pragmatic and contextual differences in French and Turkish caregivers' input

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Theoretical background of the study:
Following Gentner's (1981, 1982) fruitful claim about the universality of the noun bias in children's early productions, many studies have been conducted focusing on this issue in various languages (Choi & Gopnik, 1993, 1995; Tardif, 1993, 1996; Dromi, 1987; Caselli et al. 1995; Kim et al. 2000). The findings from these studies have led the researchers to deal with the different factors that may be effective on children's noun/verb uses. Two of these common points are the effects of caregiver speech and context (Ogura et al. 2006; Choi, 2000; Tardif, 1999). The main results of these studies have shown that the context that mothers and children are engaged in are influential in children's language productions as well as caregivers' speech.

The aim of the study:
The goal of this study is to reveal the pragmatic differences between French and Turkish caregivers speech in terms of context. A crosslinguistic comparison between French and Turkish has been preferred owing to their typological differences which have been supposed to be influential on children's noun and verb productions. The structural properties of French differ from Turkish with respect to noun/verb morphology, canonical word order and pro-dropness, leading us to conclude that French is a noun-friendly language whereas Turkish is a verb-friendly one. In addition to these language-based characteristics, we set out this study to investigate the pragmatic contribution and communicative intention of maternal speech on children's noun/verb uses under the three controlled contexts.

Method:
Participants: 13 Turkish and 13 French mothers and their children provided the language samples in this study. The children were between 01;06.00 and 02;08.00.
Data Collection: Three different contexts (Naturalistic, book-reading, toy-play) were chosen for the study. The mother-child pairs were video-recorded in each context for 10 minutes.
Data Analysis: Two levels of analysis were done on maternal utterances: frequency of nouns/verbs and pragmatic coding. All utterances of mothers in each context were analysed following the general coding schema by Ogura et al. 2006; Choi, 2000; Tardif, 1999. Mothers' utterances were given a code as noun-oriented, verb-oriented or other.

Results:
The overall results of the study show parallelism reported in the related studies regarding the contextual effects on the caregivers' speech. The book-reading context generates more nouns than verbs. However, though this is the case, French and Turkish mothers differ in their styles even within the same context. French mothers use more nouns than verbs and more object-oriented utterances in the toy-play context. However, Turkish mothers use more verbs than nouns and more action-oriented utterances in both contexts.

P2-8

References to internal states in Polish and American mother-child narratives

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When parent-child narratives include parents' references to internal states (e.g., how an individual felt or what he/she was thinking), children develop explicit knowledge structures for these internal phenomena (Thompson, 2006). Parents' references to internal states in shared narratives and conversations have been found to be associated with children's theory of mind development (e.g., Astington & Baird, 2005; Meins et al., 2002). Children's references to internal mental states predict both their academic achievement and social competence (e.g., Astington & Pelletier, 2005).

Thus far, only a small literature has examined parents' and/or children's references to internal states across cultural groups (e.g., Han et al., 1998; Wang, 2001). The present study examines references to internal states in narratives produced by mothers and children in Polish and American families. Cross-cultural comparisons in this study were exploratory as only one study thus far (with a different focus) has compared Polish and American child narratives (i.e., Weist et al., 1999). The present study also examined language-related references (e.g., "said") in the narratives. These references were studied as mothers' use of language-related terms may facilitate children's interest in and knowledge of language use and structure.

Participants were 32 mother-child dyads from the United States and 32 mother-child dyads from Poland. For each cultural group, 50% of the children were 3-year-olds and 50% were 5-year-olds. One-half of each child age sample was male. The American sample was predominantly (> 90%) European - American. There were no significant differences between the samples in child or maternal age ($p < .05$). In both groups, the average level of maternal education was graduate studies.

The mother-child dyads were asked to tell three stories about something that happened to them both recently, with the researcher as the audience. The narratives were recorded and transcribed verbatim using CHAT (MacWhinney, 2000). Narratives were coded for language-related references, and also references to three categories of internal states: emotion, volition/obligation/permission, and cognition, based primarily on Bretherton and Beeghly (1982) and Dunn et al. (1987). A bilingual Polish-English speaker coded one-quarter of the data from both cultural samples to demonstrate reliability of the coding system. Intra-class correlation analyses revealed adequate reliability (range = .80-.99) in the coding of the four categories across both samples.

T-test for independent samples revealed that the Polish mothers included significantly more references to cognitive states ($M = 27.9$, $SD = 17.2$) in their narratives than American mothers ($M = 18.8$, $SD = 13.1$), $p < .05$, as well as a significantly higher proportion of references to cognitive states, relative to the total number of words they produced, $p < .001$. It may be that this group of highly educated Polish mothers, living in a country which is rapidly entering the global economy, is particularly interested in their children's cognitive development. Across both groups of mothers, language-related and cognitive state references were included more frequently than emotion and volition-related references, $p < .05$. References to cognitive states were the category most frequently included by children.

P2-9

The effect of adult's scaffolding on the narrative skills of children

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According to some researchers, the development of children narrative skills is increased by means of the interaction with adults. Unfortunately, it is somehow difficult to test empirically the influence of adult's scaffolding, because it mainly takes place in family environments and in a variety of situations.

In an attempt to provide scaffolding under controlled conditions, we carried out a study in a school environment, with children of 1st and 3rd level of primary school. Participants were a total of 64, 32 for each age level, divided in experimental and control groups. All of them attended public schools nearby Barcelona and were taught in Catalan.

Children were tested individually in a quiet classroom, in two different sessions separated by a week. During each session, the child was shown a graphical comic strip on a computer screen and afterwards had to tell the experimenter what he or she had seen. For children on the experimental group, this first and spontaneous narrative was followed by a conversation with the experimenter, who would recall the story and draw children's attention to any missing events. During the conversation children could ask to see the comic strip again. After this phase of scaffolding, children were requested to retell the story. The control group followed the same procedure without going through the scaffolding. The sessions were recorded on audiotape and were transcribed in the CHAT format of CHILDES.

In order to analyse the data, we compared the two narratives produced by the participants according to the following measures: length (sentences and words), amount of mentioned events, and type of verbs used. The obtained results indicate that the adult's scaffolding exerts a positive effect on children's skills: the participants in the experimental groups of both age levels used more words and incorporated more events in their narratives after the scaffolding, whereas the two narrations of the children of the control groups did not differ significantly. The effect of scaffolding was more evident in 8 years-old children than in 6 years-old. These differences were interpreted in terms of children's zone of proximal development, according to which 8 years-old are cognitively closer to attain more advanced narrative skills than the younger children.

P2-10

Language use during bilingual parent-child conversations

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Bilingual children have been shown to be sensitive to their interlocuter's language (Genesee & Nicoladis, 1996). If this sensitivity is present, a key unanswered question is how their experience with other speakers might help to shape this capacity. Bilingual parents might provide cues (explicit or implicit) to help their bilingual children differentiate languages. The issue motivating this study is to determine what types of information are available in the environment to children regarding language use, when two languages are being learned.

An important way in which parents might contribute to children's sensitivity to others' language is through their own demonstration of sensitivity. Further, parents have various ways of bringing metalinguistic issues into focus by attending to translation equivalents (labels in the two languages that have the same referent). We examine these issues in the present study which includes 10 pairs of bilingual mothers and their children (M = 4;4) who speak English and Marathi (an Indian language). We use a picture-book reading task, with colorful photographs of familiar objects, as an example of an everyday activity. The mother is told to look through the book as they normally would and that use of both languages is allowed. Further, we have divided this task into three sessions: (1) the mother and child alone, (2) the mother and child with an English speaker present, and (3) the mother and child with a Marathi speaker present. The order of the three picture books and the order of the third person present were counterbalanced between subjects.

We coded each mother and child utterance as English, Marathi or mixed for each session. We found that mothers used more English with the English speaker present than with the Marathi speaker ($p < .05$) and they used more Marathi with the Marathi speaker present than with the English speaker ($p < .05$). In this way, bilingual mothers showed sensitivity to the third party present through their language use with their bilingual children. Children, however, did not show the same sensitivity. They did not show a statistical difference in their use of English between the two sessions, and they showed a non-significant tendency to use more Marathi utterances during the session with the Marathi speaker than the session with the English speaker ($p = .07$).

We also examined mothers' use of strategies in highlighting translation equivalents between the two languages and helping children to learn both labels for the pictured objects. While these types of utterances did not occur very frequently (average of 8 times per mother), 8 out of the 10 mothers used at least one of these metalinguistic approaches to helping children learn multiple labels for the objects. It is important to note that we do not know how children might be using this information; nonetheless, this study aims to characterize the input that is available to bilingual children so that future work may examine the relationship between input and learning in more detail.

P2-11

Japanese fathers' speech to sibling pairs: Young children's social skills challenged

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Family contexts give children a good opportunity to learn fundamental linguistic behavior. Multi-speaker contexts, particularly triadic interactions involving a parent with siblings, are an important step for children in acquiring social skills. Yet they have received little attention in the field of child language development and studies are limited almost exclusively to mothers in Western families. Although the findings were not perfectly consistent, the overall pattern of studies on parental language input would suggest that mothers and fathers do differ in the pragmatics of their communicative interactions (Barton & Tomasello, 1994; Bellinger & Gleason, 1982; Rowe, Coker, & Pan, 2004). Young children may benefit from interacting with two parents who may have different but complementary behavioral styles (Pancsofar & Vernon-Feagans, 2006). The current study directly addressed these issues by focusing on Japanese fathers' conversational practice and feedback opportunities available to younger versus older children in triadic contexts in comparison with mothers' speech to the sibling pairs. Triadic family interactions of 14 same-gender sibling pairs with their mothers and their fathers were separately videotaped at their homes while they were playing with building blocks. Seven brother pairs and 7 sister pairs were matched with ages (mean ages=43 mons and 78.6 mos respectively). All the discourse samples for the first 10 minutes were fully transcribed according to CHAT convention laid out by the CHILDES (MacWhinney, 2000). All the utterances were coded for addressees and speech acts (Directive, Question, Response, Statement). All the children's utterances were further categorized into Initiate, Join, and Continue in order to explore how children participated in other's conversations.

Analyses revealed that mothers and fathers did not differ in amount of talk and linguistic complexity although we observed wide variability among mothers and fathers on many measures of parental input. However, fathers talked to the younger children less than the older ones and talked to younger sons more frequently than younger daughters, while the mothers spoke almost equally to both children and both genders. Fathers used Directives to younger sons four times more than to younger daughters. Younger children uttered the most Statements to fathers in contrast with the greater use of Responses by the children in mothers' triads. We also found by using combined data of both children that they initiated approximately one third of their total utterances when addressing fathers and received successful responses to about half of the utterances, whereas mothers immediately responded to nearly 90% of utterances initiated by children. These results suggest that fathers in this study seemed to provide a more challenging linguistic environment for younger children (particularly younger sons) than did mothers. Fathers addressed younger children less frequently than their siblings and ignored half of the children's attempts to initiate conversation, a pragmatic context which required children to assume more communicative responsibility in the triadic interaction. New culturally appropriate social skill modes Japanese children may practice with their fathers at home are also discussed.

P2-12

Cultural and linguistic variations in internal state language

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During everyday interactions, young children are socialized to reflect upon their own mental and emotional states, as well as those of other individuals. As they engage in conversation with family members, children become cognizant that both they and others have feelings, intentions, thoughts and perceptions, and they begin to learn to use internal states to explain behavior and interpret experiences. While research indicates that children from diverse cultural backgrounds come to think about internal states differently, most of the literature related to the use of internal states language in family interactions has focused primarily on monolingual English-speaking families. Little research exists on the variations in internal state speech across cultural groups. The present study seeks to address this gap by examining how Spanish speaking Peruvian, English speaking U.S. American and Hebrew speaking Israeli mother-child dyads of similar socio-economic backgrounds talked about internal states during a semi-naturalistic narrative exchange.

Forty-eight mothers (16 Peruvian, 16 U.S. American, and 16 Israeli) and their five-year-old children (8 boys and 8 girls) participated in the study. All families were middle class, and all dyads were monolingual speakers of their respective languages. Dyads were visited in their homes, and mothers were asked to share the wordless storybook *Frog Where Are You* (Mayer, 1969) with their children. The researchers were not present at the time of the interaction. The book-sharing interactions were audio-taped, and later transcribed and verified using a standardized format (MacWhinney, 2000). Each instance of an internal state was later coded for: (a) type of internal state (i.e., cognition, compulsion/intention, emotion, perception, physiological, qualifier); (b) speech context (i.e., narrative or non-narrative); (c) pragmatic function (i.e., descriptive or explanatory); (d) referent (i.e., story-character, narrator/audience, other).

Preliminary analyses highlighted numerous differences in the use of internal state words across cultural groups. The U.S. American book-sharing exchanges contained more internal state references than did the interactions of the Peruvian or Israeli dyads. Furthermore, there were notable cultural differences in the type of internal states discussed. Specifically, Peruvian dyads included more intentions, emotions, physiological states and qualifiers, than did the U.S. American or Israeli dyads, who focused more on cognition and perception. There were further differences in the speech context in which the internal states were used. U.S. American dyads included more internal states words in non-narrative contexts, such as metamemory comments and personal anecdotes tangentially related to the storybook, than did the other groups. In addition, Peruvian dyads were more likely to provide or request explanatory information concerning the causes and consequences of internal states, than were U.S. American or Israeli dyads, who primarily used internal state words to serve descriptive functions. Finally, Peruvian and Israeli dyads spoke more about internal state references to the main characters in the storybook, while U.S. American dyads focused more on internal state references to the mother and child. Results are explained in relation to the impact of culture and language typology on the use of internal state words, and the implications this may have for children's socio-cognitive development.

P2-13

Linguistic and cultural differences in mother-child narratives

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Children's oral narrative development lays the foundation for their literacy development and future performance in school. Early parent-child conversations are integral to the development of the skills needed to construct and share narrative text, both oral and written. The structure and content of this early discourse influences children's narrative abilities, allowing them to develop the narrative forms most valued by their culture. The cross-cultural work on narrative development, thus far, has concentrated on mother-child dyads from East Asian and European American cultures in the context of family reminiscing. The present study expanded this focus by examining Spanish-speaking and Portuguese-speaking Latin American middle-class mother-child narratives in a book sharing task. The main objective was to discover continuities and discontinuities in narrative patterns across cultures.

Ninety-six dyads participated in this study (32 Peruvian, 32 Brazilian and 32 U.S. European American, equally divided by gender). Dyads lived in their countries of origin and were monolingual speakers of their respective languages (Peruvian Spanish, Brazilian Portuguese, and American English). Children's ages ranged from 35 to 71 months; all children were developing normally. Based on educational level and professional experiences, families belonged to middle- to upper-middle class socioeconomic levels in their respective countries. As part of a larger project, a female researcher (matched by culture and language) visited families in their homes and asked mothers to share a wordless picture-book with their children. Mothers were instructed to share the storybook as they normally would. All interactions were audio taped and transcribed using a standardized format (MacWhinney, 2000) by native speakers of the respective languages. Maternal and child utterances were coded for interactive discourse strategies and for narrative elements.

Preliminary analyses suggest both individual and cultural variations in how mothers and children participated in the construction of the story. Consistent with results from previous studies two main styles of interaction were discerned. These styles hinged on the degree to which mothers provided or requested narrative information from their children. Storytellers provided rich narrative information to their children and took control of the narrative, whereas storybuilders co-constructed the story with their children. The booksharing style mothers adopted was associated with culture. Peruvian mothers were more likely to adopt a storytelling style, whereas U.S. American and, to a lesser extent, Brazilian mothers were more likely to adopt the storybuilding style. In addition, variations were found within cultural groups that hinged on children's gender and age. In cases when Peruvian and U.S. American mothers adopted the alternate style to that adopted by the majority of their group (i.e., for U.S. Americans the storytelling style, for Peruvians the storybuilding style), children tended to be older and boys. A more pronounced age pattern was found for the Brazilian group, such that

mothers with older children tended to adopt a storytelling style, whereas mothers of younger children tended to adopt a storybuilding style. Results are discussed in relation to variations in socialization practices of the cultural groups under investigation and the role these practices play in children's narrative development.

P2-14

Exploring changes in dyadic contributions to children's early narrative development

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Studies of young children's language development often have at least two measurement issues to consider: 1) tracking the growth of language behaviors (e.g., acquisition of nominal and verb forms), and 2) tracking the demise of language behaviors not desirable in the adult target language (e.g., over-regularization of past tense forms with irregular past tense verbs). However, when language development is placed in the context of the dyad to include the behaviors of those who help the child to use their language skills (i.e., a parent), measurement is complicated further by the gradual changes (often remission) in the behaviors of the dyadic partner as the child's language abilities increase. Narrative is one important area of development that has shown influence of parental input, and its ordered sequence of macro-structural components (i.e., *Orientation, Complicating Action, Evaluation,* and *Resolution*; Peterson & McCabe, 1983) is valued later in the schooling context. Therefore, to capture the increasing narrative independence of the child in the dyad while also documenting the appropriate withdrawal of maternal assistance, we explored the changes in contribution to narrative macrostructure of each participant in the dyad when children were 3, 4 and 5 years.

Participants: Thirty-one US mother-child dyads were directed to recount personal narratives with mothers asked to assist their children as they normally would interact. The children are 52% girls, 77% Caucasian, 13% Hispanic, 7% African-American and 3% mixed race. Of the mothers, 71% completed high school. All families were eligible for Head Start or other subsidized childcare.

Coding: Maternal utterances that scaffolded the story through prompts for specific events, further detail or directly contributed to the story were identified in verbatim transcripts of the interactions. These story-specific prompts were coded using high-point analysis for the four macro-structural components detailed above. Additionally, three types of child contribution of macro-structures were identified: 1) responses to maternal story-specific prompts, 2) responses to maternal conversational prompts (e.g., backchannels such as, *"Uhhuh"*), and 3) contributions that were spontaneously generated without assistance from their mothers. Child contributions were also coded for the four macro-structural components.

Analyses: We examined the shift, across time, in the distribution of mother and child responsibility for contributing each macro-structural component to the shared narrative. Frequency and proportion of macro-structural components prompted by maternal scaffolds, child responses to maternal story prompts, maternal conversational prompts, and child spontaneous contributions were calculated.

Results: Capturing shift in responsibility of both narrators retained the number of contributing dyads across the 3 time points, where traditional methods that look only at the role of one may cease to include dyads in repeated measures analyses. The measure of dyadic responsibility during shared narration revealed a developmentally appropriate increase in independent child narration, wherein the child moves from relying on maternal prompts to providing the largest proportion of macro-structural components spontaneously (e.g., In the case of Evaluation, children's spontaneous contributions steadily increased from 20% to 45% at T1-T3). Likewise, the gradual, and appropriate, cessation of maternal participation is explored more closely using this approach (e.g., Again for Evaluation, mothers' contributions and prompts decreased from 28% at T1 to just 19% at T3).The strength of this measure is that it captures the developmental growth in children's acquisition of narrative macro-structure, while simultaneously documenting mothers' developmentally appropriate withdrawal of assistance.

P2-15

Vocal-speech imitation developmental changes in Russian mother-child dyads and orphans

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Presenting research is the study of vocal-speech interaction in mother-child dyads and in experimentation-child dyads for orphans. The goal of the research was description of mother-child vocal-speech interaction and mutual imitation during first two years of child's life for revealing normative Russian motherese dynamic and child speech mastering developmental improve the features of child speech development at mother's deprivation.

The features of mother's utterances, child speech and sounds were measured instrumentally and by auditory methods. Phonetic description of children's sounds was used. 20 mother-child dyads were video and audio longitudinal recorded during first year of child's life, 15 these dyads were recorded during second year of child's life. Children from 9 mother-child dyads had light neurological disorders, so they were marked as "risk group". 22 orphans without serious genetic and neurological disorders of first and the second years of life were recorded one or two times for every child.

Orphans demonstrated more pure sounds and words diversity. Cases of experimentation's words and sounds imitation by children were recorded very rare or were not revealed for some children. The differences between imitation activity level of children from home and orphans at the age up to 6 month were less, then for older children. Children from home produce more non-distressed vocalizations in interaction situations then orphans during interaction with experimentation. Babbling was revealed only for some children after 8.5 month of life. All children, grown up at home, demonstrated babbling timely, imitation during all the studied period. Healthy children from home were separated on two groups – children with high level of mother's words imitation and speech development and children with medium level of speech development and mother's words imitation during the second year of they life. At preverbal period some children from "medium group" and especially from "risk group" imitated rarer then children from "high group". It was shown more brightly to the age of 12 months. The imitation activity of mothers increases at the same age, when children's imitative activity improved. Mother's of children from "high group" imitate more often then mother's of children from "medium group". The features of mother's words, imitated by children, were revealed in compare with other words of the same utterance. These features were the increasing of the pitch and the duration of stressed vowel from word imitated by child. Such way of imitation is considered as more yearly stage of children speech development. The intonation expression in imitated words of mother's speech decreases with increasing of child's age. Highly imitating children with high level of speech development could imitate words that were not expressed by intonation in the utterances from the beginning of the second year. Data of the research could be considered as the important role of mother-child interaction forming during preverbal period for other stages of speech development.

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P2-16

An intensity-specific dyadic approach to analyzing affect attunement during early mother-infant interaction: A methodological comparison to traditional methods

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Background: Researchers have measured infant's affect and caregiver-infant affect attunement to examine social-cognitive development, including CJA and language. Traditionally, infants and mothers have been examined separately, with few researchers using a dyadic measure of affect attunement. Further, affect has frequently been collapsed into one positive affect category regardless of the intensity (low, moderate, or high). Many researchers reference Stern's concept of affect attunement yet do not measure specific intensities or allow for the mapping of vitality contours. The current study compares traditional methods (non-dyadic infant affect and collapsed intensities) with an intensity-specific dyadic measure of affect attunement. Because the latter measure is the most labor-intensive, it is important to justify such an approach. The results of these differing approaches were contrasted in a predictive model examining the stability of infant's CJA skills.

Methods: Fifteen mothers-infant dyads participated in object-mediated free-play at 6, 9, and 12 months of age. Mother-infant interaction was captured utilizing split-screen video. Data was microanalytically coded for affect attunement at 6 and 9 months and CJA at 9 and 12 months. Affect attunement was measured utilizing affect-intensity matching (neutral, low-, moderate-, and high-positive intensity) occurring within a 2-second window during mutual-engagement time (ME-time). The comparison predictor measures were the percent of ME-time dyads demonstrated 1) low-, moderate-, and high-intensity affect matching (intensity-specific; dyadic), 2) positive affect matching (collapsed; dyadic), and 3) infant affect at each intensity (intensity-specific; non-dyadic), and 4) infant positive affect (collapsed; non-dyadic). The primary outcome measure was the mean length of CJA episodes at 12 months. CJA was measured utilizing a well-replicated coding scheme (Adamson, et al., 2004; Bakeman & Adamson, 1984; Carpenter et al., 1998).

Results: Comparing the dyadic approaches, the intensity-specific approach had a strong predictive relationship to CJA at 12 months ($R^2 = .604$, $p < .05$); whereas the collapsed approach had no effects at all. This is due to the opposing directions of the relationships of low versus moderate intensity (see other abstract). Comparing non-dyadic between dyadic approaches, the dyadic approach showed a strong predictive relationship; whereas the non-dyadic approach masked the strength of the relationship and was spurious.

Conclusion: The intensity-specific dyadic approach is preferred because the predictive relationships are evident and statistically sound. Analyzing unique contributions of differing intensities resulted in the identification of a predictor to CJA. Results suggest that an intensity-specific dyadic approach be considered when analyzing the role of affect attunement in social-cognitive development.

P2-17

English/Spanish child bilingual transfer: The case of NN compounds

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Cross linguistic transfer in bilingual children has been explained in terms of ambiguity of overlapping structures (Müller 1998, Hulk and Müller 1999, Nicoladis 2002), frequency in the input (Hulk and van der Linden 1996, Nicoladis 1999) and language dominance (Döpke 1998, Nicoladis 1999, Paradis 2001).

In this paper we look into the morpho-syntactic differences between English and Spanish Noun + Noun (NN) compounds like *pirate boat / barco pirata* in the experimental production data from different groups of speakers, in order to investigate whether ambiguity, frequency in the input or language dominance accounts for transfer.

English and Spanish NN compounds differ in the directionality of the head (right-headed in English and left-headed in Spanish) and in their productivity (more in English than in Spanish) which implies, in principle, more frequency in the input. Based on previous findings involving English/Spanish and English/French bilinguals (Liceras and Díaz 2000; Nicoladis 2002), we hypothesized that directionality is the morpho-syntactic property which will play a more important role in the production of NN compounds.

In order to test this hypothesis, we designed an experimental test that includes a set of 25 pictures. Out of these, some correspond to drawings named with an NN compound both in English and in Spanish; and some others to drawings named with an NN compound in English (*tool box*) but with an alternative construction in Spanish (*caja de herramientas*) (e.g., N + prepositional phrase, N + adjectival phase).

The participants in this production test were two groups of English/Spanish bilingual children: a first group that has acquired the two languages from birth (L1 bilingual children); and a second group that has Spanish as a first language and early exposure to English in an institutional context (L2 bilingual children). This second group includes children who have been exposed to different amounts of input in English at school (from 1-3 hours per week, to 20-25 hours per week). These child data will also be compared to the adult data we have elicited from two groups of English L2 and Spanish L2 university students.

The results from this experimental test on NN compounds show that, even though instances of non-target constructions not related to directionality were found, directionality accounts for most of the instances of transfer. We will also argue that, together with directionality, frequency also plays an important role in the production of NN compounds both in English and in Spanish.

P2-18

Rules versus analogies for the English past tense: Does similarity to stored regulars influence regular inflection in a "wug-test"?

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A debate at the heart of cognitive science is whether human cognition relies on the notion of abstract symbolic rules or on process such as analogy and abstraction over stored exemplars. The most widely-discussed test-case for this debate has been children's acquisition of the English past-tense. Under any account, when a past-tense form can be retrieved from memory, this form is output. When a form cannot be retrieved (due to memory failure, or because the verb is novel) the two major accounts make different predictions. Consider the case where a child fails to retrieve the past tense form for *throw* (i.e., *threw*). Under a "dual-route" account (e.g., Prasada & Pinker, 1993), the child will first attempt to generate a past-tense form on phonological analogy with stored *irregular* forms (e.g., *blow/blew*, *know/knew*). If this fails (for example, there are not sufficient similar stored exemplars) a *default-rule* ("add *–ed* to the verb stem") steps in to generate **throwed*. Importantly, stored *regular* forms are never available for phonological analogy. Under a single-route account (e.g., Bybee & Slobin, 1982) there is no default-rule. When a stored form is not available, one is generated on analogy with other stored

past tense forms; *both irregular and* (in contrast to the dual-route model) *regular*. Thus, the child will generate a past-tense for *throw* on analogy with similar irregulars (e.g., *blow/blew*, *know/knew*) and similar regulars (*show/showed, glow/glowed*). Whether *threw* or **throwed* is output depends on the relative weight/activation of these stored exemplars.

The models can be differentiated by a classic novel verb "wug-test". Both predict that the more similar a novel verb is to existing irregulars, the more likely it will be to receive irregular inflection, as both allow for phonological analogy to stored irregulars. However, only the single-route model predicts that novel verbs that are highly similar to existing regulars should be more likely to receive the *–ed* inflection than novel verbs that are less similar to existing regulars, as only this model allows for phonological analogy to stored regulars. The dual-route model explicitly predicts (e.g., Prasada & Pinker, 1993) that the extent to which a novel verb is similar to stored regulars should *not* influence the likelihood of its receiving *-ed* inflection, which can occur only by application of the default rule (with analogy to stored regulars explicitly ruled out).

To choose between these accounts, we asked 25 children (aged 6-7) to generate past-tense forms for novel verbs that were either similar or dissimilar to existing irregulars and – crucially – similar or dissimilar to existing regulars (similarity-to-irregulars and similarity-to-regulars were crossed in a 2x2 within-subjects design). The findings were clear: Novel verbs that were similar to existing regulars received *–ed* inflection on 76% of trials. Novel verbs that were *not* similar to existing regulars received *–ed* inflection on 62% of trials ($F_{1,24}$=27.23, p<0.001). Thus the findings support the single-route model under which novel past-tense forms are generated by analogy to stored irregulars *and* (counter to the dual-route model) regulars.

P2-19

Verb morphology in Catalan speaking children. From 2 years to 3 years, from no productivity to little productivity

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The current work studies verb morphology acquisition in Catalan, a language with a rich morphological verb paradigm. The main objective is to compare the productivity with verb morphology between two groups of children along the third year of life. Our prediction states that the youngest children will not show any productivity with verb morphology, whereas the oldest will show productivity.

The method was adapted from Olguin & Tomasello (1992). The participants were 24 children divided in two groups of twelve children, a group of 2-year-olds and a group of 3-year-olds. We used an experimental design characterized by training children with new verbs. These verbs were invented according to phonotactic characteristics of Catalan language and were varied in their suffixes for "Pretèrit perfecte" (Present Perfect) and Present. We also trained the construction "a+infinitive". Each child was assigned to one of three different conditions in order to train them in only one of these verb forms. We also varied the verb transitivity.

The main findings show that the youngest children use new verbs only with the morphological form they have heard. However, both young and old children use the morphological forms used in the training with familiar verbs. On the other hand, the oldest children show certain productivity with suffixes. Moreover, omission of some sentence constituents is observed in both groups, and also a preference for using some of the verbal forms is observed. These results are discussed in relation to the discontinuity assumption of linguistic competences in infancy and in relation to theories that assume that frequency, use and input are crucial factors in language development (Abbot-Smith & Tomasello, 2006).

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P2-20

Modelling the development of the German participle in a constructivist neural network

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Connectionist models have made an important contribution to the ongoing past tense debate by showing that associative systems can model rule-like behaviour as emerging from exposure to linguistic input, as opposed to stipulating the psychological reality of explicit rules. It has been argued, however, that the connectionist approach to modelling verb inflection crucially relies on the fact that the most frequent case (e.g. attaching '-ed' to form the regular English past tense) is also the default. The situation is different in the case of the German past participle where regular and irregular verbs are equally frequent, and both regular and irregular forms require a suffix to be attached to the stem. The German participle thus provides a valuable testing case to investigate whether an associative system's exploitation of the statistical properties of a language would still bring about the dissociations between regular and irregular participles that, in parallel to the English past tense, have also been found in a broad range of studies for German.

Previous models have also been criticised because their exhibiting of a u-shaped learning profile crucially depends on the progressive extension of the training set during the learning process. This is problematic because a growing vocabulary should be an attribute of the child rather than the learner's linguistic environment.

We investigate these criticisms by training a constructivist neural network model on a comprehensive corpus of German verbs (extracted from the German CELEX corpus, including all non-ambiguous verbs with less than 4 syllables and a raw frequency of at least 1 per million). The model is inspired by the experience-dependent development of cortical processing structures and progressively allocates structural resources (units and connections) in response to experience while keeping the training set static. This process leads to a 'single-mechanism-dual-pathway' architecture where a partial functional dissociation between two developed processing pathways emerges from statistical properties of the input-output mapping. We demonstrate that the model (a) acquires an adult level of competence, (b) shows u-shaped learning, even at the level of individual verbs, (c) captures detailed phenomena relating to the ratio of overgeneralization errors during the acquisition process, and (d) develops progressive functional differentiation with respect to the dominant pathway. Because constructivist models adjust their architecture in response to the affordances of the task the emergent dissociations are evident in both the model's performance and architecture. This allows us to also address recent empirical findings that claim differential processing of verbs in terms of neurological location.

Importantly, emergent dissociations are determined by statistical factors such as present and past frequency, age of acquisition, phonological similarity, and neighbourhood size and composition. It is the combination of these factors that make an individual verb easy or hard to learn/process, thus providing a detailed and gradual account of processing difficulties in verb inflection that does not rely on *a priory* syntactic distinctions (such as regular/irregular) or innate 'default' rules.

P2-21

Learning irregular plurals – why irregulars are like regulars

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How irregular forms are acquired has been a source of a debate between single-route and dual-route models of lexical representation. Both models can accommodate over-regularization errors, but while the dual-route model predicts that all irregular items should induce an equal number of errors (Marcus et al. 1992), the single-route one predicts that error rate will be related to token frequency, as found in a earlier corpus study (Maslen et al., 2004). The current study provides support for a single-route model by showing that over-regularization errors elicited in an experiment are affected by token frequency and task type (recall vs. recognition) both of which also affect lexical access of regular forms. The study also tests the effect of the situational context (naming vs. teaching) on children's errors to add a social dimension to what affects the activation level of lexical items.

We investigated four and five-year olds' knowledge of nine irregular plurals in five conditions: naming pictures, re-naming pictures, teaching a puppet English, correcting the puppet's production, and a forced-choice between two options produced by the puppet,. Half of the children participated in the teaching condition. The other half re-named the same pictures without teaching. The other three tasks were completed by all children

The results show a clear effect of token frequency on over-generalization errors. Each item was given a frequency proportion (token frequency / total irregular token frequency) calculated on the basis of child-directed speech from an English database (MacWhinney, 2000). Items with higher corpus frequency caused less errors, B = 2.902 (SE = 0.68), $p > .001$; exp (B) = 18.203. When broken into two frequency bins, high frequency items induced more correct responses (34% correct) than low frequency ones (22% correct), B = .627 (SE = 0.16), $p > .001$; exp (B) = 1.872.

There is also a difference in performance between naming (recall) and forced-choice (recognition). Children produced correct irregular forms only 30% but chose the correct form in a forced-choice task 40% of the time. This mirrors differences between recall and recognition in lexical access. Children accepted both forms in the forced-choice task 17% of the time, demonstrating some interchangeable use (also observed in spontaneous speech). Children were better at re-naming (40% correct) than at teaching (26% correct) or correcting the puppet (8% correct), suggesting that it is not only token frequency but also situational frequency that influences performance – children teach or correct English less often than they name pictures. This appears similar to the finding that lexical access is related to emotional and situational factors (Goldinger, 1998; Nygaard & Lunders, 2002). The results reveal effects of token frequency, an interchangeable use of correct and incorrect forms, and effects of task type that are easier to accommodate with a single-route model. Further parallels in the lexical access of regulars and irregulars will be discussed.

P2-22

Representation of changes in nominal morphology by learners of Catalan as an L2

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Studies on L1 acquisition of nominal inflectional morphology claim that children parse DPs and are sensitive to number distinctions from very early on. However, unlike typically developing L1 learners, who uniformly attain mastery of plural marking, L2 learners have a very fluctuating acquisition rate. L1 acquisition of derivational morphology appears to be acquired later than inflectional morphology, but its acquisition in a second-language context has not been exhaustively explored, especially in Catalan.

The aim of this study is to evaluate and compare the representation of changes in inflectional and derivational nominal morphology, both orally and in writing, by L2 learners of Catalan. Our subjects are 20 Chinese and 20 Moroccan children, who have been living in Catalonia (Spain) and attending Catalan schools for about 18 months, and a control group of 20 age-matched Catalan children. Children's L1s differ, thus, typologically from the L2. Moreover, the relationship between their L1s and their WS1s also differs from that of the target language, a fact that might affect their written representation of changes in nominal morphology.

Children participated in a number-inflection task that consisted in presenting the child with an *initial picture* with the image of an object (a car, an apple, a tree, etc.), and a caption at the bottom that indicated what appeared in the image. Four pictures were presented in this fashion (singular condition), while another four depicted, initially, a plurality of objects (plural condition). The derivation task had an identical structure: four pictures with a single object, and another four depicting the place where one buys such object. After the initial card, a second card —with no caption at the bottom— was presented, involving a transformation in number (for the inflection task) or in derivation (for the derivation task). Children were asked to name the initial and the target picture and, afterwards, to write a caption for it. All the utterances, and also the written captions, were analyzed. The objective was to characterize their oral and written representations of the changes in nominal —inflectional and derivational— morphology, and to determine L1-influence and age-related factors.

Results show no significant differences as a function of participants' L1s, neither in oral nor in written productions, although the kind of errors children committed might be related to their mother-tongues. Age-related differences were found: in all language groups, older children outperformed younger ones. These findings will be discussed in the light of the different hypotheses as to L1-influence on L2 learning. Finally, plural formation and locative derivations were more difficult than their singular and base-noun counterparts. The explanation has to do with L2-knowledge of the lexicon and the more salient cardinal function of singular, indefinite articles.

P2-23

ERP components following morpho-syntactic errors in typically developing children

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This study used event related potentials (ERPs) to investigate the neural basis of syntactic processing in typically developing children. Adult studies have identified two ERP components that reflect syntactic processing, the P600 and the Left Anterior Negativity (LAN) or Early Left Anterior Negativity (ELAN). These components occur after presentation of a syntactic error with the P600 reflecting controlled aspects of processing and the LAN/ELAN automatic processing (Friederici, 2002). Phrase structure errors elicit an ELAN followed by a P600, whereas a LAN followed by a P600 occurs after morpho-syntactic errors. Recent child studies have found greater developmental differences in the ELAN compared to the P600 (Friederici, 2006); however, the developmental course of the LAN is largely unexplored. Also unclear is whether the pattern of P600 development previously reported is unique to phrase structure violations or similar across all types of syntactic errors. This study explored how the P600 and LAN change over time and whether these components differ with the type of syntactic error being processed.

Participants include three age groups (8-year-old children, 14-year-old children, and adults) with 20 participants per group. Stimuli were English sentences presented auditorially. Participants made grammaticality judgments after each stimulus. Four stimulus conditions with 40 items per condition were analyzed. 80 filler sentences were also presented for a total of 240 items. Experimental conditions included morpho-syntactic (i.e., subject-verb agreement) omission errors and a corresponding set of controls with no errors, and overt morpho-syntactic errors and their corresponding controls.

Data are currently being collected. The morpho-syntactic omission errors and the overt morpho-syntactic errors will be analyzed separately. Separate analyses will also be conducted for midline and lateral electrodes. ANOVAs will be used with the between subjects variable of age (adult, 8-year, 14-year) and the within subjects variables of stimulus condition (error, control), electrode location (anterior, posterior), and, for lateral electrodes, hemisphere (right, left). Based on previous studies, a P600 is expected for all ages. This finding would replicate previous reports that the controlled syntactic processes reflected by a P600 are established by 8 years. Assuming the developmental trajectory of the automaticity of morpho-syntactic processing parallels that of phrase structure processing, a LAN is expected for the adult and 14-year groups but not the 8-year group. This pattern would be comparable to the ELAN results previously reported.

Difference waves for the omission and overt errors will be used to identify ERP differences between these two error conditions. Because children are more accurate at judging overt errors compared to omissions (Rice et al., 1999), predictions include a prolonged acquisition of automatic processing of omitted errors as compared to overt errors. Therefore, the LAN following morpho-syntactic omission errors at age 8 is expected to show greater differences from the age-14 and adult groups than the LAN following overt morpho-syntactic errors.

Results of this study will contribute to the understanding of neural processing of syntax in children, specifically whether automatic and controlled syntactic processes are similar across various types of syntactic structures and how these processes change over time.

P2-25

Italian for beginners: An ERP study on language learning in 6 month old children

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Several behavioural studies have shown that within the second year of life, children can process syntactic dependencies between non-adjacent morphemes in their mother tongue (Santelmann et al., 1998; Höhle et al., 2006). Due to the fact, that non-adjacent morphemes are fundamental in language we hypothesized that the neural system is already sensitive to such structures in very young children. In the present study, we tested the ability of 6-month-old German babies to extract non-adjacent dependencies in a foreign language (Italian) by using ERPs elicited during a learning paradigm. During four familiarization phases children were exposed only to correct sentences in which the auxiliaries *puo* or *sta* reliably predicted the endings *-are* or *-ando* in the subsequent verb (e.g. la sorella sta arrivando; la sorella puo arrivare). Each familiarization phase was followed by a test phase which contained correct as well as incorrect sentences (e.g. la sorella sta arrivare; la sorella puo arrivando).

The ERPs of the test phases revealed differences between the processing of the verb in the correct and incorrect sentences. This difference was realized as a positivity for the processing of the incorrect sentences compared to the correct ones. The present results demonstrate that even very young children are able to learn dependencies in a foreign language, though the exact mechanisms involved have yet to be elucidated.

P2-26

Simpler is not always easier: L1 acquisition of determiner phrase by a simultaneous Mandarin-English bilingual

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This paper presents findings from a longitudinal case study on L1 acquisition of Determiner Phrase (DP) by a balanced Mandarin-English bilingual child in a one-parent one-language environment. The languages acquired are structurally and genetically unrelated. In the DP domain, English is assumed to have a simpler structure of [DP D [NP N]] (Abney 1987), whereas Mandarin has a complex structure of [DP D [NumP Num [ClP Cl [NP N]]]], in which two intermediate projections between D and N are proposed, namely the Number Phrase and Classifier Phrase (Li 1999). Our study finds that, perhaps surprisingly, the more complex Mandarin DP structure begins to develop significantly earlier. The two full-fledged DP structures appear however almost simultaneously. We present an overview of the extensive data and discuss findings with reference to the degree of autonomy in development of the two DP systems as well as any apparent signs of interdependence.

Based on Mandarin diary records from 0;10.16 to 2;11;3 and 13 video recording sessions from 2;1.9 to 2;5.10, and English diary data from 0;10.16 to 2;6.8, the study shows that irrespective of the apparently differing structural complexities, the full-fledged DP structures in each language emerged around the same time. For Mandarin, the full-fledged DP structure was attested first by indefinite nominal expressions (1;10.10) and then by definite nominal expressions (1;10.27). For English, in contrast, it was attested first by definite nominal expressions (1;10.2) and then by indefinite nominal expressions (1;10.25). An *atypically* speedy acquisition of the more complex Mandarin DP by the bilingual child is ruled out as a contributing factor given that in a previous comparative study (the author's PhD thesis 2005 and presented recently at the International Symposium on Bilingualism 6, 2007 Hamburg) his Mandarin DP development was found to be highly comparable with that of a monolingual Mandarin subject in terms of ages of emergence, MLU values, and the developmental pathways. Possible facilitators underlying the earlier progressive development of Mandarin DP (e.g., structural properties, input properties, etc.) are discussed.

Analysis shows no obvious evidence for cross-linguistic influence or transfer, i.e., none of the obvious transfers that might be speculated to arise are in fact observed. There appears room for suggestion that the earlier (progressive) acquisition of Mandarin DP in Ralph's case may have accelerated the acquisition of his English DP. The overall picture for Ralph's bilingual development is that the two DP systems develop independently of each other without cross-linguistic influence, indicating an *autonomous development* (De Houwer 1990; Meisel 1990, 1994; Paradis & Genesee 1996, 1997). However, when it comes to the *pace* of acquisition of the two systems, *interdependent development* may occur in the sense that earlier acquisition of one system can also accelerate the rate of acquisition of the other.

P2-28

Validity of parent report measures of vocabulary and grammar for 2 year old Irish speaking children

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Introduction: Previous research has demonstrated the validity of parent report using the MacArthur-Bates CDI as an estimate of early vocabulary and grammatical development across a range of languages and children (Dale, 1991; Fenson et al., 2007). In the study reported here, the CDI was adapted to Irish (ICDI), an official but minority language of Ireland with complex morphosyntax, and used longitudinally to assess the early language of 21 children. This poster examines the validity of the parent- report instrument using a subset of ten 2-year olds from the main sample.

Method & Procedures: The adaptation took into consideration the common and unique features of language acquisition of Irish, including additional regular bound morphemes (six in ICDI) and grammatical complexity sentences in sets of up to 3 and 4 items (as opposed to the sentence pairs in the English version). Parents were visited in their homes on six-monthly intervals from age 16-40 months, and interviewed as to their child's current level of vocabulary and grammatical development using the ICDI. Additionally, a spontaneous language sample of approximately 30 minutes was taken of child and parent interaction during book-reading and free-play. Elicitation tasks for salient morphemes were also carried out. The spontaneous samples were transcribed into CHAT files and various measures of lexical and grammatical development were then derived using the CLAN programme (MacWhinney, 1991)

Outcomes & Results: The elicitation tasks could not be successfully carried out with this age group. In comparing parental report with spontaneous speech data, Concurrent validity correlations demonstrated high validity for ICDI total vocabulary with the Number of Different Words (NDW) and lexical diversity (D) measures derived from the spontaneous sample. However Type-Token Ratio (TTR) did not correlate with ICDI vocabulary even when the samples were controlled at 100 utterances. In addition, ICDI measures of grammar (including the three longest utterances reported by parents, and the number of regular bound morphemes used and grammatical complexity sentence scores) also correlated highly with the derived MLU and the number of regular bound morphemes used in the spontaneous samples. The results were encouraging as to parents' ability to report reliably on their children's grammatical development, as multiple regression analysis indicated that grammatical complexity is the best predictor of spontaneous MLU accounting for over 70% of the variance. This is in keeping with results for English speaking 24-months olds on the CDI by Dale (1991) and is an important feature of the ICDI and parent report of syntax. Findings also showed a strong and significant relationship between the reported number of regular bound morphemes used and that derived from the spontaneous samples. The data is to be analysed on an item-by-item basis to determine parents' accuracy at reporting on individual lexical items and syntactic structures.

Conclusions: Although both ICDI and spontaneous vocabulary measures were highly correlated, the ICDI checklist includes a broader range of words and so would seem to capture the range of language ability better than direct observation can hope to. The findings have implications for developing parent report measures of early language development in other highly inflected and minority languages.

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P2-29

Vocabulary assessment in toddlers: A comparison between 2 versions of the French adaptation of the computerized comprehension test

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The assessment of language comprehension in infants and toddlers constitutes a challenge in many respects given young children's obvious limitations in motivational and attentional resources as well as in compliance. Parental reports (i.e. the McArthur Communicative Development Inventory, Fenson et al., 1993), provide a convenient method for estimating lexical comprehension, although data resulting from such reports are often weakened by the situational context, the overt intention of the caregiver and the presence of a familiar visual referent (Tincoff & Jusczyk, 1999). These potential biases advocate in favour of the elaboration of more direct, performance-based measures of lexical comprehension. Recently, Friend and Keplinger (2003) developed the Computerized Comprehension Test (CCT) in which the child is presented with a prompt containing a target word (i.e. where is the CAT? Touch the CAT) and two pictures on each vertical half-screen, and is asked to touch the picture matching the word. This procedure is based on a classical picture pointing task (comprehension book), and in addition, provides a direct recording of the toddler's response through a touch screen and, when the child responds correctly, a reinforcement procedure using amusing sounds. The original test was designed in English and showed good reliability compared to the MCDI and to the standard picture pointing task.

In this paper, we will report 2 studies. In the first, we adapted the CCT to French to validate it with 32 15-to-19-months old, French-speaking toddlers. Both a test-retest reliability phase and a comparison with the data collected through the French adaptation of the MacArthur Communicative Development Inventory (Kern, 2003) have been performed. Results show that most children of this age are able to perform the task (although not always until the end). We observe a significant effect of the morphosyntactic class as well as of the level of difficulty. Furthermore, we obtain a significant positive correlation with the lexical scores on the MCDI.

The second study was designed to try to optimize some aspects of the CCT. Two main changes to the French adaptation of the CCT were performed: (1) Instead of being presented by an experimenter, the prompt and the stimulus were recorded and presented through a loudspeaker, and (2) each response was reinforced, although correct responses were more strongly and amusingly reinforced than incorrect responses. Data are currently being collected and the results will be compared with those of the standard French adaptation of the CCT.

P2-30

The relation between question asking and expressive vocabulary in low and middle income families

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Adults know that one relatively efficient way to acquire new knowledge is to ask questions. However, because asking questions requires knowing about the type of question to ask as well how to ask that question, it is likely that the ability to ask pertinent questions in understandable ways is a linguistic skill that develops over time and with linguistic experience. Previous research has shown that parental input is related to the acquisition of specific linguistic skills such as syntactic competency (e.g. Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002) and lexical diversity (Li & Shirai, 2000). Furthermore, familial characteristics such as income-level appear to mediate the relation between parental input and child linguistic competency; children growing up in low-income households are involved in fewer interactive linguistic episodes with their parents than are children living in middle-income households, and this dearth is thought responsible for the deficit in vocabulary knowledge for children living in poverty (Hart & Risely, 1995). The purpose of this investigation was to delineate the pattern of functionally-defined questioning by children between the ages of 3 and 5 and to attempt to relate that patterning to the kinds of questions asked by parents of differing income levels. This was done in order to determine if differences between two groups in terms of the questions asked to and by children might be related to differences in expressive vocabulary knowledge. In order to assess this question the number and type of questions asked by children, and to children by parents, were examined using transcripts from one low-income (HSLLD, *N* = 96) and one middle-income (Gleason, *N* = 24) corpus from the CHILDES database (MacWhinney, 2000). A combined statistical approach employing the Friedman and the Mann-Whitney Wilcoxon revealed significant age differences for both income-levels, where, overall, older children were more likely to ask questions relating to object features such as function and causation and younger children were more likely to ask questions about names of objects and explanations for behavior. However, the timing of when these types of question were posed differed for the two income groups, with low-income parents and children lagging behind their middle-income counterparts. In addition, we found that the lag seen in low-income families was related to differences in expressive vocabulary between the two groups. In particular, it was observed that specific question types, including questions about the names and functions of objects and questions about the internal states of others, were significantly and positively related to children's expressive vocabulary levels, as indicated by the Spearman-Rho. Although it is difficult to discern the direction of these results, based on previous findings in the literature we can posit that certain types of questions may aid in children's ability to acquire knowledge about new words and concepts. In addition, differences in the timing of when different question types are employed by the two groups may help to explain the discrepancy in vocabulary knowledge for children growing up in disadvantaged households.

P2-31

A normative study of the development of vocabulary and grammar in young German-speaking children assessed with a German language development inventory

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The aim of the present study was to give a description of the typical course and extent of variability of vocabulary and grammatical development in a normative sample of German-speaking children between 18 and 30 months. To this end a parent report instrument was developed. The instrument is modelled on the American CDI (Fenson et al., 1994). However, with respect to grammar the content of the questionnaire differs considerably from the American CDI taking account of the more highly inflected nature of German.

The instrument contains a vocabulary section of 600 words, a sentence complexity scale encompassing morphosyntactic changes indicative of increased sentence length and complexity, and an inflectional morpheme scale assessing inflectional knowledge in five paradigms which are known to emerge during the age range of 18 to 30 months: noun plurals, gender marking, case marking, main verb inflectional marking, modals and copula. Each grammatical paradigm is scored separately. There is thus a score per grammatical paradigm and for the total inflectional morpheme scale. The sentence complexity scale is scored equivalently to the American CDI. Individual linguistic items in the vocabulary and grammar checklists are drawn from extensive naturalistic data of German (Szagun, 2004).

Participants were 1192 parents of children in 13 monthly age groups between 18 and 30 months with roughly equal numbers of boys and girls. There were between 79 and 105 participants per age group. Eight percent of the total sample; were bilingual with German as their first language. Participants were residents in the towns of Hannover, Essen, Bremen, Oldenburg and surrounding smaller towns. They were contacted via 13 pediatricians' practices.

Results are presented as age-related trends, relations between scales, and between grammatical growth in dependence on vocabulary. For vocabulary and the main grammar scales (total inflectional morphology scale and sentence complexity scale), age-related growth is analyzed in terms of measures of dispersion, representing the performance of children scoring at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} percentiles per age group. Results show extensive individual variability on vocabulary and grammar scales, thus confirming the results in different languages for German. Within the inflectional morphology paradigms, noun plural and gender marking were acquired faster than case marking and verb inflections. Modals and copula were acquired most slowly. The different language skills were strongly related, with grammatical development increasing non-linearly in dependence on vocabulary. Effects of the demographic factors gender, social class, and birth rate were stronger than in studies using the CDI in other languages favouring girls, first-borns and children of more highly educated parents. Concurrent validity and reliability of the instrument are high.

The present study presents the first normative data on vocabulary and grammatical growth in German-speaking children. A short version of the questionnaire is currently developed. This can be used as a screening instrument whereas the long version allows a fairly detailed profile, especially of grammatical development.

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P2-32

Serial order short term memory predicts later vocabulary development: Evidence from a longitudinal study design

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Recent short-term memory (STM) models assume that the role of STM is to retain serial order information while the retention of item information largely depends on the activation of representations in the language system (e.g., Gupta, 2003). Hence, if verbal STM is causally related to vocabulary development, as suggested by some authors (e.g., Baddeley, Gathercole, & Papagno, 1998), we should expect a strong association especially between serial order STM capacity and vocabulary development. The association between item STM and vocabulary development is assumed to simply reflect the common reliance on language knowledge (Majerus, Poncelet, Elsen, & Van der Linden, 2006; Majerus, Poncelet, Greffe, & Van der Linden, 2006). The aim of the present study was to test this hypothesis using a longitudinal study design, by determining whether serial order STM capacity predicts later vocabulary development.

Sixty typically developing children were tested at the age of four and one year later. At each session, we assessed receptive vocabulary knowledge (French adaptation of the Peabody Picture Vocabulary Test) (Dunn, Thériault-Whalen, & Dunn, 1993), non-verbal intelligence (Raven's Coloured Progressive Matrices) (Raven, Court & Raven, 1998) serial order STM, and item STM. Serial order STM was assessed using a serial order reconstruction task and consisting in the presentation of sequences of highly familiar animal names; after each sequence, the children reconstructed the order of presentation of the names using cards depicting the animals. Item STM was assessed using a single nonword delayed repetition task; contrary to the serial order reconstruction task, the stimuli were unfamiliar and new at every trial, maximizing phonological item processing requirements; serial order STM requirements were minimized given that a single nonword of identical syllabic structure (consonant-vowel-consonant) had to be retained at each trial.

Partial cross-correlation analysis showed that both serial order STM and item STM capacity at Age 4 predicted vocabulary knowledge at Age 5, after control of initial differences in age, vocabulary knowledge, and non-verbal intelligence. However, when computing difference scores, reflecting the performance increase for the different STM and vocabulary measures from Age 4 to Age 5, only the increase of serial order STM performance predicted the increase of vocabulary knowledge.

Our findings confirm previous transversal studies showing selective relationships between serial order STM, item STM and vocabulary development, and arguing for a dissocation between serial order and item STM capacities (Majerus, Poncelet, Greffe et al., 2006). The longitudinal study reported here allowed us to provide a stronger test for this position, by showing that the increase of serial order STM capacity over a one-year period predicts the increase of vocabulary size over the same time period. These results support theoretical models that assume a causal role for serial order STM in vocabulary development.

P2-33

Does expressive vocabulary size at 24 months predict later language and literacy skills?

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Recent studies have suggested that there is continuity between early language and reading (cf. Silven et al., 2007). This study investigated whether expressive vocabulary size and lexical composition at age 2 can predict later language and literacy skills from ages 3 through 11 of English-speaking children. Specifically, the current study seeks to determine the predictive ability of the widely used MacArthur-Bates Communicative Development Inventories (CDI) on subsequent language development. The CDI has been widely used to assess the lexical development in studies of typically-developing infants [cf. Dionne et al., 2003) and at-risk infants for developmental disorders (cf. Kosher et al., 2005) as well as in longitudinal studies (e.g., NICHD).

A total of 1073 children between 2 and 11 years of age from the NICHD Study of Early Child Care longitudinal database were analyzed. Expressive vocabulary size and lexical composition at age 2 were measured by the CDI. Based on the total number of words produced at 24 months, the subjects were divided into high and low vocabulary groups (using both a median split and a top-bottom one-third split). High and low verb groups were constructed similarly. Later language skills were assessed by 12 measures. These were the Reynell expressive language and vocabulary comprehension scores at 36 months, the Preschool Language Scale -3 total language score at 54 months, the Woodcock-Johnson (WJ-R) letter-word identification score at 54 months, Grade 1, 3 and 5, and WJR passage comprehension score at Grade 3 and 5, WJR broad reading score at Grade 3 and 5.

A series of multivariate analysis of covariance (MANCOVA) and regressions were used to determine the ability of expressive vocabulary size and lexical composition at age 2 to predict later language outcomes. Gender and Socio-economic status were included as covariates. Our analyses reveal that children in high expressive vocabulary group at age 2 continued to perform significantly better than those in the lower group in all the outcome measures. A separate series of analyses with verb vocabulary size as a predictor also produced similar results, but the effect size was smaller for the outcome measures. Thus, the total vocabulary size at age 2 as measured by CDI is a better predictor of later language ability up to Grade 5 than lexical composition.

P2-34

The development of grammatical skills in Swedish children with language impairment: The relationship between phonological and lexical skills at 5 and grammatical skills at 10

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Many studies have shown that phonological processing as measured in non-word repetition tasks is important for the development of lexical and grammatical skills in children. Children with language impairment with a range of different mother tongues have been found to have problems with non-word repetition. Further, lexical skills and vocabulary development form an important basis for the development of grammatical skills. The main purpose of this study is to explore grammatical skills in Swedish children with language impairment from a longitudinal perspective. More specifically, we wanted to find out how phonological and lexical skills at age 5 contribute to grammatical skills at age 10. The participants were 17 Swedish children with language impairment assessed at age 4;11-5;11 and at age 9;10-10;6. At age 5 the assessment included tasks measuring non-word repetition, phoneme production, lexical retrieval and organization, comprehension at the word and sentence level and narration. At age 10 the assessment focussed on comprehension at the sentence level and on grammatical production in different tasks. At age 5, the participants had significant problems with phonological processing and grammar, compared with children with typical language development. At age 10 they still lagged behind on grammatical skills, both in comprehension and production. Sentence comprehension and grammatical production at 10 were significantly related to lexical retrieval and organization at 5 but not to non-word repetition. The results indicate that language problems are still present at age 10, but the range of symptoms is slightly different compared to at age 5, relating more to fluency and intelligibility than to the use of grammatical morphemes. Grammatical skills at age 10 seem to be related mainly to lexical skills at age 5.

The discussion focuses on the relationship between cognitive and language skills in children with language impairment, as it changes over time.

P2-35

A cross linguistic comparison of the relationship between the home literacy environment and early receptive vocabulary

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Receptive vocabulary offers an early window into the course of language. The present study explores the relationship between social-pragmatic factors, embedded within the home literacy environment (HLE), and language comprehension in the second year of life. Of specific interest are cultural influences that may affect this relationship across languages. Elements of the HLE, both social-pragmatic and literacy factors, share an emphasis on the time spent in communicative engagement. Yet there is inconsistency across studies regarding the efficacy of the HLE for predicting receptive language acquisition in toddlers and preschoolers. Moreover, cross-cultural differences in components of the HLE have been identified. This research seeks to clarify these findings. First, the varied conceptual scope of the HLE may be one source for discrepant findings across studies. We have integrated both narrowly- and broadly-defined measures of the HLE (Children's Title Checklist [CTC] and Home Literacy Environment Questionnaire [HLEQ]) to evaluate the relative efficacy of social-pragmatic factors relative to literacy practices on early comprehension. Second, culture-general, as well as culture-specific patterns of responsiveness (a key component of the HLE) have been demonstrated within Western cultures. For instance, results from comparisons of mother-infant dyads in New York and Paris indicate that American mothers engage in more dyadic and joint attentional responses. Further, differences exist in the size of infants' emerging receptive vocabularies across French and English. These findings have implications for the association between the HLE and early comprehension. The present study assesses the HLE, early comprehension, and their relation in San Diego and Geneva. We predict that the HLE, broadly-defined, will explain significance variance in receptive language. Further, we expect the general pattern of association to obtain across languages. In contrast, however, we expect the characteristics of the HLE which underlie that relationship to vary across languages. We use the MacArthur-Bates Communicative Development Inventory: Words and Gestures (CDI: WG) and the French adaptation of the same measure to assess vocabulary comprehension. We anticipate reporting findings on a sample of 40 infants acquiring American-English and 40 infants acquiring Swiss-French between the ages of 16 and 21 months. Based on a preliminary sample of 20 infants acquiring American-English we found the expected positive relationship between the HLEQ and vocabulary comprehension. A multiple regression analysis revealed that the CTC and HLEQ did account for a significant amount of variance in CDI: WG scores, $F(2, 16)=24.161$, $p < .01$, $R^2=.751$. The partial regression coefficient relating the HLEQ to receptive language was large and statistically significant, $\beta=.878$, $p < .01$. However, the partial regression coefficient relating the CTC to receptive language was not significant, $\beta = .095$, $p > .05$. These initial findings support our hypothesis that a broadly-defined HLE explains unique variance in early language comprehension. We expect similar results in infants acquiring Swiss-French. Given previous cross-cultural findings regarding components of the HLE, further analysis will be conducted to evaluate specific factors measured by the HLEQ that may differentially predict language comprehension in infants across cultures. Implications on early language acquisition will be discussed.

P2-36

Early development of lexical comprehension and production in an Italian sample: A longitudinal study

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Longitudinal studies conducted on small samples through direct observation of infants' gesture and linguistic communication have underlined that the period between 10 and 18 months is critical for the emergence of lexical comprehension and gesture production and their relations with early lexical production (Bates, Benigni, Bretherton, Camaioni, Volterra, 1979; Capirci, Contaldo, Caselli, Volterra, 2005). Other studies conducted cross-sectionally on large samples by administering the questionnaire CDI (long form) to parents of 8- to 17-month-old infants have found similar results and have underlined that lexical comprehension is correlated with gesture production and precedes the development of lexical production which becomes quantitatively similar to gesture production around 16-17 months (Caselli, Casadio, 1995). Recently a short form of the CDI has been developed in order to quickly assess early language development; this form is also useful in longitudinal studies where repeated administrations of the long form would be impractical (Fenson, Pethick, Renda, Cox, Dale, Reznick, 2000). The aim of our study is to examine longitudinally (monthly between 10 and 17 months) through the Italian short form of the CDI (Caselli, Pasqualetti, Stefanini, 2007), whose data correlate with those collected with the Italian long form (Recchia, Stefanini, Pasqualetti, Caselli, 2006), early development of lexical comprehension and production and gesture and their relations paying attention to individual profiles.

Method:

Participants. Seven healthy monolingual Italian children (2 females, 5 males). Children at risk (e.g., preterms, twins) were excluded.
Tool and Procedure. The Italian short form of the CDI was monthly filled in by parents from 10 to 17 months. This form is constituted by four parts:

1 A 100-word vocabulary checklist with separate columns for comprehension and production
2 18 questions to investigate non verbal communication (actions and gestures)
3 18 items to observe infant's behavior (e.g., babbling, symbolic play)
4 Anamnestic information

Results. Descriptive analyses run on part 1 and 2 of the CDI showed an increasing of lexical comprehension and gesture from 10 to 17 months, except in one child which had a minimum change in words comprehended and gestures. These results underline the importance to analyze lexical comprehension and gestures in this range of age, with attention to individual profiles. With respect to lexical production, the analyses revealed that children produced few words until 13 months, while afterwards a large variability was present with different individual trends in vocabulary acquisition. Correlations showed that gestures, lexical comprehension and lexical production in the first months (10- 13 months) were strongly correlated with the same abilities in the following months (i.e., gestures with gestures, comprehension with comprehension and production with production). In addition, a strong relation between lexical comprehension and gestures was found. By contrast, the correlations between lexical comprehension and production were spared because of the large variability found in lexical production. The results underline the importance to check these abilities longitudinally, during this developmental period, through the short form of the CDI in order to identify children with difficulties in linguistic comprehension, taking into account gesture production and monitoring the emergence of lexical production.

P2-37

Mapping and extending novel verb labels by Japanese 18-month-old children

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There is still debate over whether verbs are harder to learn than nouns in early lexical development (e.g., Bornstein et al., 2004; Gentner, 1982; Tardif, 1996). One way to address this issue is to examine when children begin to attach verbs to their referents. Recent studies found that by 14 months, children can rapidly map novel words to actions with a single exemplar after minimal exposure (e.g., Kobayashi, et al., 2006a; 2006b). Although these findings show the children's efficient ability to map words onto actions, a more intriguing issue is whether children can extend newly mapped verb labels to a novel instance, i.e., when children begin to learn verbs in an abstract level. To address this issue, the present study examines whether and when children under 2 years of age can begin to represent a particular action regardless of who is performing it, to map a novel word onto the action, and to extend the mapped word to the action performed by a novel exemplar.

Eighty 12-, 14-, 18-, 20, and 22-month-old Japanese-speaking children were tested using a habituation "Switch" paradigm (Casasola & Cohen, 2000; Cohen et al., 2000; Werker et al., 1999). During habituation, the children viewed computer-animated events in which four exemplars (i.e., fishes that differed in colour and shape) were alternately engaged in two intransitive actions (*R*otating, *R*ocking) paired with two pseudo-words in a Japanese sentence frame ("*NEMA*-teiru-na [*NEMA*-ing]", "*DAKU*-teiru-na [*DAKU*-ing]"). After being habituated to the two pairings (*NEMA-R*otating, *DAKU-R*ocking), the children viewed a fifth novel exemplar performing the actions with the same pairings (*NEMA-R*otating, *DAKU-R*ocking) and with switched pairings (*DAKU-R*otating, *NEMA-R*ocking). If children could extend the mapped words to actions with a novel exemplar, they should detect the switched trials during test phase.

The results showed that the 18-, 20-, and 22-month-olds (but not 12- and 14-month-olds) looked significantly longer at the switched than the same pairings, indicating that the children after 18 months can rapidly map novel words onto actions with multiple exemplars and furthermore extend the mapped words to a novel instance. The findings suggest that by 18 months, children seem more likely to acquire the ability to learn verbs in an abstract level.

P2-38

Lexical development in Cantonese-English bilingual children

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The paper reports on the lexical development of two bilingual children exposed to Cantonese and English from birth, arguing for early differentiation of the lexicon based on the acquisition of translation equivalents from 1;03 to 2;0. We also present evidence for a word spurt in Cantonese, the dominant language of the bilingual children. An influential principle that is assumed to guide early word acquisition is the Principle of Contrast (Clark 1987, 1993, 2000) which states that every two forms should contrast in meaning. The Principle is taken to imply that the child avoids synonyms in early development. Not only does the principle guide the monolingual child's lexical development, but it has also been claimed to apply in bilingual lexical development (Frank and Poulin-Dubois 2002). However, when the Principle is applied to the bilingual context, there are additional factors to be considered, including patterns of input and language dominance (Lanvers 1999). A strict interpretation (Clark 1993) suggests that even bilingual children at the earliest stage will accept only one label for an object, despite exposure to another label for the same object from a different language. On a broader interpretation, the Principle could apply within but not across a bilingual child's languages. On this interpretation, the Principle applies within two lexicons which constitute separate and differentiated systems from early on.

Unlike studies which measure lexical development based on parental report using the MacArthur Communicative Development Inventory, this study analyzes longitudinal data produced spontaneously by the bilingual children. The number of translation equivalents shows that the child is regularly using two labels, one from each language, to refer the same object from on. Methodological issues in determining what count as translation equivalents will be discussed. Some salient features of first words in Cantonese such as reduplication in Cantonese word formation will be discussed.

The results show that the bilingual children readily use cross-language synonyms throughout the period of study. The data are argued to support early lexical differentiation and the availability of two lexicons which in turn serve as the basis for syntactic differentiation, the precursor for the construction of two grammars. The results may be interpreted as supporting the Principle of Contrast operating in two differentiated lexicons, such that there is no genuine violation of the Principle even when two labels are used to encode the same meaning. Moreover, evidence of a marked increase in the lexical growth rate is found in the bilingual children's Cantonese, their dominant language but not in English, their weaker language in the earliest stage of their productive vocabulary.

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P2-39

Word learning in monolingual and bilingual 17-month-olds acquiring English and French

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Previous studies show that monolingual 17-month-olds are able to associate phonetically similar labels with novel objects when tested in the switch task using native language nonsense words (e.g. Werker, et al 2002). When bilinguals were tested in this same procedure using phonetically similar words recorded by a monolingual speaker of one of their native languages, they did not show evidence of learning the object-word pairing (Fennell et al., 2007) suggesting a later emergence of phonetic category use in bilinguals. In the current study we tested 17-month-old monolingual English, monolingual French, and English/French bilingual infants on phonetically similar nonsense words ("bowce" and "gowce") recorded by a simultaneous English/French bilingual. The stimulus strings included tokens of

French and English productions of "bowce" and "gowce". Differences between the French and English variants of each nonce word are subtle; monolingual adults (English and French) were not able to reliably identify the tokens as English or French. Infants were tested using the Switch Task wherein they were habituated to 2 novel word/object pairings. Test trials consisted of a switch trial, a familiar word and object in a novel pairing, and a same trial, the familiar word/object combination from the habituation phase. Bilinguals looked longer at the switch trial, successfully associating the label with the object. Surprisingly, neither monolingual group succeeded in doing so, failing to replicate previous studies with monolingual infants. A second Switch experiment was conducted to determine whether the monolingual infants' failure was due to the subtle variation in voice onset time of /b/ and /g/ in English and French. Monolingual 17-month-olds (English and French) were tested using stimuli recorded by the same talker but using only native language productions of each nonce word in which the /b/ and /g/ phones more closely match the infant's native language VOT values. French infants showed evidence of associative word learning; preliminary data from English infants also suggest that they succeed in the task. Thus, monolingual 17-month-olds are strongly affected by subtle phonetic variability such that increasing the match between the test stimuli and their native phonetic categories bolstered their performance. The success of monolingual infants in experiment 2 and bilingual infants in experiment 1 suggests that differences between monolingual and bilingual patterns of word learning are not due to delayed development of phonetic category use or to a general cognitive strain as a result of bilingualism. Rather differences appear to be related to the infant's experience with phonetic variability which is not the same in a monolingual and a bilingual exposure to the same language. Despite apparent differences, bilingual infants, like their monolingual peers, appear to develop phonetic perception skills that facilitate language acquisition in their natural environment, thus revealing a link between speech perception and emerging language skills.

P2-40

A cross linguistic analysis of children's first prepositions

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English-speaking children have been shown to use spatial prepositions very early (around 1;05), and in a holophrastic, 'verb-like' manner (Tomasello, 1987). Based on the spatial value of children's first prepositions in English, parallels have been drawn between the acquisition of prepositions by children and the grammaticalization of prepositions in diachrony (Tyler & Vyvyan 2003). Thus, semantically charged prepositions, (more 'concrete' and less grammaticalized) are said to be used by children several months before functional (more 'abstract' and more grammaticalized) ones. However, cross-linguistic studies have suggested that ontogeny does not parallel phylogeny (Slobin, 2004) and that the factors determining the acquisition of prepositions are linguistic rather than cognitive (Rice 1999).

In order to examine the validity of such claims in a verb-framed language (Talmy, 2000), while double-checking them on new English data, we have analyzed and categorized all uses, omissions and misuses of prepositions in five longitudinal corpora (three French and two English-speaking children) between 1;08 and 3;08 according to both semantic and social-discursive factors. The semantic coding consisted in distinguishing spatial from functional uses of prepositions. The two English-speaking children in our study conformed to the findings in the literature: they started with a significant majority of prepositions having spatial values (eg: *up*, *in*, *on*). This points to the fact that English particles (such as *up, down, back*) are used to express PATH, whereas in French, verbs serve this function. The three French-speaking children followed a different trend, using functional prepositions before spatial ones. The prepositions *pour*, *à* and *de* appeared first, and were used in complex constructions within an argumentative context (i.e. disagreement, misunderstanding).

We then conducted qualitative analyses of the first uses of French prepositions by all three children. Through a close examination of utterances in context, we show that first prepositions are used to mark a relation between speakers, objects, and the situation of utterance and not just to link parts of speech within the utterances.

Ultimately, we find that the children, while coping with the same communicative needs, have reached for different tools according to their relevance in context and communicative efficiency. The use of prepositions in different languages does seem to be influenced by the structure of the particular language the child is acquiring (Talmy 2003, Hickman & Robert, 2006) as well as by parameters such as discursive organisation and context. The results of our analyses in the French corpora lead us to the conclusion that the grammatical category of prepositions emerges within an early pragmatic paradigm, with first prepositions being used to express and organize social interaction. Their acquisition may be seen as a landmark towards the development of conversational skills.

P2-41

Word learning and executive functioning in young monolingual and bilingual children

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The present study integrates two lines of research to more fully understand the linguistic and executive functioning of young monolingual and bilingual children. Past research comparing monolinguals and bilinguals' acquisition of new words under the mutual exclusivity paradigm has yielded inconsistent results (e.g., Au & Glusman, 1990; Merriman & Kutlesic, 1993), whereas studies examining children's performance on executive functioning tasks involving control of attention has typically found a bilingual advantage (e.g., Bialystok & Martin, 2004; Carlson & Meltzoff, in press). These studies focused on children who were 4 years of age or older. The present research investigated whether this bilingual advantage in executive functioning could be found earlier in the cognitive development of bilingual children and whether differences in executive functioning influenced the acquisition of new words as indicated by adherence to mutual exclusivity.

The sample consisted of 85 children between the ages of 29 months and 63.6 months. These children were distributed in three age groups as follows: younger group (age range of 29 to 39 months), middle group (age range of 40 to 49 months), and older group (age range of 50 to 63.6 months). In the younger group there were 17 monolinguals (M = 34.5 months) and 9 bilinguals (M = 34.7 months); the middle group consisted of 15 monolinguals (M = 45.4 months) and 19 bilinguals (M = 45.5 months); and the older group included 14 monolinguals (M = 53.4) and 11 bilinguals (M = 59.4).

Participants were tested on four executive functioning tasks: Luria's tapping, Reverse Categorization, Opposite Worlds, and the computerized Fish Flanker task (administered to the two older groups only). The linguistic task combined the mutual exclusivity paradigm (Markman & Wachtel, 1988) and the socio-pragmatic paradigm (Jaswal & Hansen, 2006) in order to examine how children acquire new words. Additionally, all children were tested on Peabody Picture Vocabulary Test – III (PPVT - III) as a background measure of receptive vocabulary.

Performance on PPVT – III replicated previous research where monolinguals obtained higher scores on receptive vocabulary compared to bilingual children. Results of the experimental tasks revealed that bilingual children outperformed monolinguals on Luria's tapping task and Opposite Worlds. On the mutual exclusivity/ socio-pragmatic task, monolingual and bilingual children showed a similar pattern

of acquiring new words when presented with new labels and points, with no language group difference on any measure. For example, both monolingual and bilingual children were more likely to choose novel objects over familiar objects when hearing new labels in the absence of pointing.

Overall, these results indicate that young children who speak two languages show enhanced performance on tasks which require executive control to inhibit a prepotent response (e.g., imitation of experimenter's tappings), or the application of an arbitrary rule (e.g., do the opposite of what you see). Moreover, this enhanced performance is apparent in children younger than 4 years of age. Thus, bilingual children show better control of attention than monolingual children, in the context of remarkably similar performance on the linguistic task.

P2-42

Names that are not words: Older infants still associate non-linguistic sounds with pictures

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Late in the second year of life, children begin to learn novel word-object or word-situation associations at a very rapid rate. Previous research suggests that at the same stage children cease to associate non-linguistic sounds with objects(*1*). We used a preferential looking paradigm to investigate individual differences strength and speed of word-object or non-linguistic-sound-object associations at 21 months.

Children (N=53) heard either one of a pair of novel words ("Look! Look at the tutty!) or one of a pair of non-linguistic sweeps (pairs of short pure-tone transitions of different sizes appended to the start of longer static-frequency pure tones), and at the same time saw a pair of pictures, each of a different object set in a landscape. When children fixated the correct picture after the end of the word or sweep the object became animated.

Looking time was significantly longer, and latency of looking after the word or sound ended shorter, to the correct picture, when children heard either pair of sweeps, or one pair of novel words (post-sound looking time for the second pair of novel words approached significance, with 29 children only). All measures appeared similar for words and sweeps. Correct looking to pictures associated with sweeps was significantly correlated with children's auditory comprehension abilities. In a control condition children rewarded randomly did not associate either words or sweeps with objects.

We conclude that children towards the end of the second year can still associate non-linguistic sounds with objects, especially if the objects are salient and interesting, and that this ability is related to language comprehension skill.

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P2-43

Acquisition of universal and language-specific sound symbolism

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Sound symbolism is an inherent relationship between sound and meaning of words. Child and adult speakers of different languages can detect how well novel words sound-symbolically match with certain shapes (Maurer et al. 2006; Davis, 1961) or manners of locomotion (Imai et al., 2007). Thus, certain aspects of sound symbolism may be universal and are accessible to both adults and young children. However, it is also known that second language learners have difficulties learning subtle semantic distinctions in sound symbolic words. Thus, certain aspects of sound symbolism may be language-specific.

The current study investigated whether English-speaking children acquire universal sound symbolism earlier than language-specific sound symbolism, using sound symbolism for manner of locomotion. We predict that young children who are less familiar with their own language cannot detect the language-specific sound symbolism; conversely, older children and adults can. Furthermore all age groups can detect universal sound symbolism, which may be more innate in nature.

Method: To select the stimuli, English, Greek and Japanese monolingual adults viewed 72 pairs of novel word and video recording of various manners of locomotion, and rated sound symbolic match on a scale of 1 (does not match at all) to 7 (matches very well). From the rating, we selected four Universal items, for which speakers of the three languages gave high scores, and four English-Specific items, for which only English speakers gave high scores, and four Non-match items, for which English speakers gave low scores. The scores significantly differed across languages for Language-specific items ($p=.001$), but not for Universal items. Posthoc test for the Language-specific items showed English gave significantly higher scores than the other two languages ($p<.05$). Furthermore, English speakers gave higher scores for the Universal and Language-specific items than for Non-match items ($p< .01$).

80 monolingual English-speakers (60 children with age range of 17-37 months, and 20 adults) were presented with a novel sound symbolic word and two video clips. Each video pair consisted of either a Language-specific or Universal item plus a distracter (Non-match item). They indicated which video matched the word better, by pointing.

Results: The percentage of trials with correct choice was entered into a 2 (word type: Universal vs. Language-Specific) x 4(age: 17-21, 22-29, 30-37 months, adults) ANOVA. There was no main effect of word type or age, and no interaction.

The percentage of trials with correct choice was not significantly higher than chance (50%) in 17-21 months for Language-specific items (M=50) and Universal items (M=59) and in 22-29 months for Language-specific items (M=57). However, it was marginally or significantly higher than chance in 22-29 months for Universal items (M=60, $p=.06$), and in 30-37 months for both Language-specific items (M=57, $p=.06$) and Universal items (M=54, $p=.09$) and adults for both Language-specific items (M=63, $p=.07$) and Universal items (M=65; $p=.02$).

Discussion: Though the ANOVA did not show the predicted interaction between word type and age, the pattern of results in the comparison to chance suggests that universal sound symbolism may be acquired earlier than language-specific one.

P2-44

Word recognition and lexical development in preterm children: A longitudinal study

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Preterm birth (≤ 32 weeks of gestational age) and very low birth weight (< 1500 g.) are associated with risk factors that can have a negative effect on future speech and language abilities. Some recent studies have found significantly lower scores for preterm children in a language comprehension test at two years, suggesting auditory processing difficulties (Jansson-Versakalo et al., 2004). However, controversial data exist concerning the prevalence of speech perception and receptive/expressive language deficits in this population. Also, little is known about the developmental pattern of such abilities in pre-terms, especially before age two.

Longitudinal data from a sample of preterm children (n=24) without congenital, physical or severe neurological anomalies, will be presented. Children were tested at two age levels: 18 and 24 months (corrected ages for gestation were used). Two independent groups of at term children (18 and 24 month-olds) served as controls. Two measures have been obtained, one that reflects their ability to perceive phonetic detail in known words and the other relative to their productive vocabulary, as an indication of their attainment in lexical development. Previous results from an independent group of preterm infants at 24 months of age revealed that word recognition was not impaired although attention differences were observed during the task compared to a control group of at term children. In the present study, word recognition was measured by means of a visual fixation task. Infants were shown two pictures while a pre-recorded sentence was presented mentioning one of the two familiar objects. The object labels were either correctly pronounced or mispronounced via a vowel change. Different measures were obtained: overall fixation times and orientation latencies, number of visual shifts and peak looking times. In previous research using this procedure, higher fixation times and lower latencies in the correct pronunciation condition are taken as an indication of children's phonologically well-specified lexical representations. Number of shifts and peak look measures can reveal the pattern of attention during the task. Productive vocabulary size was assessed by means of a parental questionnaire (Spanish and Catalan versions of the MacArthur CDI). Overall results indicate significant differences between the two age groups of preterm children. Sensitivity to mispronunciations could only be observed in the older group, with significantly longer fixations to correctly pronounced targets. However, attention differences were also present when compared to the control group. At 18-monhs of age word recognition and sensitivity to phonetic detail seems to be impaired. Their behavior differs significantly from the control group of the same age. A developmental pattern has been observed in this sample of VLBW children, with an improvement of their attention capacities and sensitivity to phonetic detail in known words, between 18 months and 24 months of age. The long term consequences of this initial delay deserve further study. The role of neonatal risk factors in the present results will also be discussed.

P2-45

Children's word learning from storybooks and definitions across variable contexts, age groups & abilities

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Children's vocabulary size during the primary school years is a strong predictor of later reading ability and other scholastic achievement (e.g. Sternberg, 1987; Cunningham & Stanovich, 1997; Muter et al., 2004). Research has therefore sought to identify how parents and teachers might best encourage the learning of new words during the early school years.

Previous research has shown that substantial gains in vocabulary can be made simply through encountering new words in an appropriate context, such as a storybook (e.g. Dickenson, 1984; Elley, 1989; Robbins & Ehri, 1994; Justice et al., 2005). A number of studies have shown that elaborating on the meaning of a new word when it is encountered in such contexts, for example by providing a definition of the word's meaning, increases the word learning accomplished by the child (e.g. Elley, 1989; Penno et al., 2002). However, it is unclear whether definitional explanations per se benefit children, or whether definitions simply provide 'more context' for the child to use to infer the word's meaning. In addition, few studies have investigated whether the effectiveness of such word teaching strategies differs for children of different ages or vocabulary abilities.

This study therefore investigated the utility of implicit contextual cues to word meanings in classroom storybook readings as a means of teaching novel vocabulary to younger (6-7 yrs) and older (8-9 yrs) primary school-aged children. One hundred and forty four children (6-7 yrs: N = 71; 8-9 yrs: N = 73) were read a story once a week for three weeks by their class teacher. Eight high-level target words, usually acquired at an age well into adulthood, were incorporated into each story. Children heard either the same story or a different story each week, and these provided either only contextual cues to the words' meanings or both contextual and definitional information. Knowledge of the words was assessed three times: immediately before training (baseline), immediately after training (post-training test) and after a two week non-intervention period (retention test).

Results show that presenting new words in the context of a story is a highly effective means of introducing new vocabulary to both younger and older children, and that the learning achieved in this way is retained, at least for two weeks We found that elaborating word exposure by providing definitional information each time a novel word was encountered significantly increased the amount of learning accomplished. However, in the absence of an explicit definition, presenting words in a greater variety of contexts (i.e. in three different stories rather than one) provided similar benefits. Importantly, the benefits evidenced in these conditions were equivalent for children of differing ages and vocabulary abilities, contrary to previous findings (e.g. Dickenson, 1984). However, we also found that children's initial vocabulary ability (BPVS level) was a better predictor of word learning than age, with more able children out-performing those with lower initial vocabulary knowledge. Our findings have influential practical implications for both parents and teachers concerning the most effective strategies for increasing children's vocabularies during the primary school years.

P2-46

Conceptual attributes of heard words modulate toddlers' attention to the visual scene

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Adult-like comprehension involves much more than simply linking a sound form to a single meaning. Mature word understanding involves integrating a word into a vast lexical network containing detailed real-world knowledge about the usage and realization of words as well as an information about a word's semantic relatedness to other lexical entries. This knowledge is reflected by automatic shifts of visual attention when adults hear words as they are looking at a visual scene. For example, when adults hear a word such as piano, they not only increase looks to a picture of a piano, they also tend to look towards objects that are semantically related to the spoken word (e.g. trumpet; Huettig & Altmann, 2005; Yee & Sedivy, 2006) or visually related to that word (e.g. similar shape or color; Huettig & Altmann, 2004). In this study, we ask whether childrens' conceptual integration is adult-like: Is their attention to objects in the visual field automatically guided by the activation of stored conceptual knowledge related to spoken words?

A variant of the Preferential Looking Paradigm was used to test whether stored perceptual attributes of known words effect how 36-month-olds direct their attention to objects in the visual field during on-line word recognition. Forty-two Dutch-learning 36-month-olds were tested. When asked to find an object not present on the screen, children looked significantly longer to a color-matched competitor than a distractor that did not match the typical color of the named target. For example, if they were shown a red plane and a yellow plane and asked whether they could see the strawberry, they tended to fixate the red plane rather than the yellow plane. This effect occurred soon after word offset and was observed despite the fact that children were given a full 4 seconds to identify the objects for what they were (i.e., planes rather than strawberries). These findings demonstrate that children are like adults in that they access stored conceptual (i.e., color) knowledge during on-line word recognition, and readily integrate this lexically activated information with information derived from the visual field.

Preliminary results of a follow-up study with 24-month-olds suggest that toddlers who cannot yet use color terms reliably in an explicit test nonetheless access color information during on-line word recognition in the same way as 36-month-olds. This study also

extends our results to category membership. For example, 24-month-olds appear to look longer to a dog than a sneaker when they hear 'crocodile'. Our data represent the first clear demonstration that language-mediated eye movements in children are a sensitive index of the overlap between the conceptual information accessed on hearing spoken words and the perceptual properties of concurrent visual objects. Moreover, the testing paradigm we employ in this study holds great potential for further exploring how language learners' developing understanding of word meanings interfaces with their processing of perceptual/conceptual information.

P2-47

Learning names and generalizing nouns: Insights from a dynamic systems model of word learning

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Young children tend to generalize novel names for novel solid objects by similarity in shape; a phenomenon dubbed "the shape bias". This robust bias has been shown to related to the development of the early noun vocabulary in that it: 1) appears after children learn a number of concrete nouns for solid objects, 2) differs cross-linguistically and is tuned to the specifics of the language children are learning, 3) is less robust in late-talking children. Theoretical opinions differ as to the nature of the shape bias. We contend that the critical insight needed to understand the details of when children attend to shape and what it means comes from Dynamic Systems Theory and a process model of how children's knowledge about names and categories is brought to bear in a task in a moment in time. Further, we suggest that only by understanding how individual behaviours at this real timescale accumulate to create later behaviours, can we make progress in understanding the development of word learning biases in both typically and atypically developing populations.

We illustrate this with our recent work modelling task effects and developmental changes in the shape bias from 1.5- to 4-years-of-age in forced choice and yes/no tasks. Previous studies suggest 30-month-old children generalize novel names for deformable objects by shape in some tasks, but by material in others. Other work has shown that children's attention to shape in naming tasks becomes more robust over development as the early noun vocabulary expands. We modelled these findings in Dynamic Neural Field model—a computational model inspired by Dynamic Systems Theory. Our model instantiates critical aspects of the decision processes that form the basis of young children's ability to generalize a novel word from a named object to a new instance. Differences in children's noun generalizations across forced choice and yes/no versions tasks were captured by changes in the amount of comparison the model engaged in for each task. Developmental differences were captured by implementing two relatively simple hypotheses in the model—that the link between attention to shape and naming tasks becomes stronger over development, and that there is a decrease overdevelopment in the amount of noise in children's representations of the stimuli. Thus, our model has implications at both real-time and developmental timescales. Specifically, at the real-time timescale, our modelling work suggests that the specifics of the task have a critical influence on how children use what they know about nominal categories to learn new words. Likewise at the timescale of development, our modelling work shows how individual decisions can accumulate over time to create developmental differences. In addition, because similar models have been used to capture performance in a range of cognitive tasks, this modelling work ties noun generalization behaviours to a more general theory of decision processes and developmental change. Understanding noun generalization at this level is critical to taking the next step of understanding how and why some children generalize nouns in atypical ways; the next step in this line of work.

P2-48

Word learning context influences toddler fast mapping and word retention

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Young children are amazing word learners, saying their first word by about 12 months and over 300 words by about 24 months. Indeed, a young child presented with two familiar objects and one novel object, can correctly pick the novel object when presented with a novel name (i.e. "get the blicket;" Carey, 1978; Carey & Bartlett, 1978). This "fast mapping" ability is often cited as evidence of children's word learning proficiency. Recent research, however, indicates that fast mapping and word learning represent distinct time scales of language acquisition. The present research builds on this finding to further explore the processes that govern how an initial name-object mapping becomes a known name, specifically focusing on competition and the particular objects presented.

Toddlers' behaviour in several fast mapping contexts was explored using a forced-choice task with known and novel objects followed by a stringent retention task. On each fast mapping trial, children saw familiar objects and one novel object, and were asked to either get a familiar object (e.g., car) or a novel object (e.g., blicket). In Experiment 1 we explored the influence of increasing children's familiarity with objects from the to-be-learned category by presenting children with a variable number of exemplars while keeping the total number of trials constant across conditions. Overall no only did the number of exemplars influence children's ability to retain the newly fast mapped names, but also the order in which the names were introduced mattered. In Experiment 2 we varied the number of competitor objects present during the forced-choice fast mapping trials. Indeed, children's performance varied as a function of the number of competitors present.

Taken together, these results indicate that each of these factors – familiarization with the to be learned category and the other stimuli presented in the task -- play important roles in young children's ability to retain newly fast mapped names. Further Implications are discussed in terms of the Probabilistic Constraint Satisfaction / Associate Learning (ProCS-AL) perspective and suggest critical roles for competition, complexity of the stimuli presented, constraint satisfaction and associative learning for both fast mapping and word retention. The results support the ProCS-AL perspective as an approach to better understanding fast mapping and word learning more generally.

P2-49

From word-object association to fast mapping: A longitudinal study

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Research has demonstrated infants' ability to rapidly acquire a label for a novel action or a novel object (Casasola & Cohen, 2000; Werker, Cohen, Lloyd, Casasola and Stager, 1998). Numerous other studies have also demonstrated that if a child hears a novel label, while presented with two objects, one of which is familiar and the other unfamiliar, then the child will reliably select the unfamiliar item as the referent for a novel label (Golinkoff, Hirsh-Pasek, Bailey & Wenger, 1992; Hutchison, 1986; Markman & Wachtel, 1988; Merriman & Bowman, 1989; Merriman & Schuster, 1991). Furthermore, it has also been demonstrated that children can generalize a novel label acquired during a fast-mapping task to a novel exemplar (Frank & Poulin-Dubois, 2005). The current paper examined the issue of continuity in children's word learning abilities. More specifically, the relationship between 18-month-olds' performance on a

word-event association task and their performance on a fast-mapping task at 24 months was explored. Furthermore, the relationship with concurrent and longitudinal vocabulary was also examined.

Infants aged 18 months (N =24) were tested using an infant-controlled habituation paradigm. They were presented with two different habituation events that consisted of a novel label paired with an object in motion. Habituation events were presented until the infant met the habituation criterion, up to a maximum of 20 trials. When children looked away from the screen for longer than one second, the trial ended, and an attention getter helped redirect children's attention to the screen for presentation of the next trial. At the end of the habituation phase, the test phase was administered, in order to determine how infants construed these event-label pairings. The test trials consisted of four events based on a switch design. The baseline trial preserved the original event-label pairing, whereas the other three test trials consisted of presenting children with events where one of the elements was switched. The word-switch trial consisted of one of the original labels paired with a different event. The object-switch trial consisted of the original label paired with a different object undergoing the same motion, and the motion-switch event consisted of the original label presented with the same object undergoing a different motion. A standard fast-mapping task modelled after Frank and Poulin-Dubois (2005) was administered to a subsample of the infants at 24 months of age (N =16). The task consisted of 4 trials; on each trial, a familiar, fast-mapping and generalization question was asked. Parents completed the Bates-MacArthur Communicative Inventories: Words and Sentences at both ages. The results suggested that children's ability to form a word-event pairing at 18 months was related to their ability to comprehend familiar words at 24 months. There was also evidence suggesting that children's ability to form a word-object association is related to their vocabulary at 18 and 24 months. This study is the first to demonstrate a link between vocabulary and word mapping assessed with a habituation paradigm.

P2-50

Examining the impact of early bilingual exposure on the event-related potentials of children and adults in a word-learning task

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The focus of this research was to help elucidate the neural level impact of early and ongoing dual language exposure on language processing and development in typically-developing bilingual children and adults as compared to their unilingual peers. This question was addressed in a neuroimaging context wherein event-related potentials (ERPs) were used to examine neural response differences between groups during a fast-mapping task and in a phonological and semantic violation task. Event-related potentials (ERPs) were recorded as subjects listened to known and novel words after visual referents of each one appeared on a computer screen in random order. Results showed different waveform patterns between adults and children, with the latter showing more pronounced early negative and late positive components, and an apparent reversal in most positive stimulus types, at least for the later part of the epoch. Adults showed greater positivities to novel words, while children showed greater positivities to known words. Behavioural comprehension and production measures confirmed that a high level of novel word learning took place for all groups, but was impacted by age. In a second, classic violation task, ERPs were recorded as each group listened to the same known and novel words, but this time each target either matched or did not match the visual referent on the computer screen. For mismatched targets, results showed a clear negative-going response peaking around 266 ms for adults and 324 ms for children, followed by a large descending positivity from 400 ms onward for adults and 600 ms onward for children. Bilinguals showed greater differentiation of waveform types than did unilinguals, overall. These findings are hypothesized to reflect basic novel word processing differences between children and adults, and between unilingual and bilingual brains.

P2-51

Dutch-learners' acquisition of nonadjacent dependencies: Diminutive versus plural agreement

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In natural languages, morphosyntactic elements often establish relationships between words or phrases. In the course of language development, acquiring these relationships is an important step in acquiring the structure of one's language (Morgan, 1996). These elements, however, need not be (and are often not) adjacent. Some studies have suggested that nonadjacent dependencies may be particularly difficult to learn (Newport & Aslin, 2004). Nevertheless, artificial language studies have shown that 15-month-old infants track grouped remote dependencies (Gomez & Maye, 2005) and that 18-month-olds are able to differentiate between grammatical and ungrammatical verbal nonadjacent dependencies in English, German, and Dutch (Santelmann & Jusczyk, 1998; Höhle et al., 2006; Wilsenach, 2006 respectively). In this study, we extend this work to frequent articles and suffixes.

Dutch-learning 24-month-olds were tested using the Headturn Preference Procedure (Kemler Nelson et al., 1995). Children listened to lists of diminutive noun phrases (NPs). In Dutch, diminutives are often formed by adding the suffix *-je* to a noun. In addition, the definite article preceding the noun is changed into *het* (e.g., *de hond* 'the dog', *het hondje*, 'the doggie'). This results in a nonadjacent dependency between the article *het* and the diminutive suffix *-je*, interceded by the noun itself. In this study, grammatical trials thus consisted of diminutive nonsense nouns combined with the correct article *het* (e.g., *het* kag*je*) while ungrammatical trials consisted of diminutive nonsense nouns combined with the other, incorrect, definite article *de* (e.g., *de* kag*je*). To control for possible preferences for *het*-initial NPs regardless of whether this results in a grammatical dependency, a control study tested the same age group on a less frequent and less regular plural dependency (diminutive dependencies occur approximately twice as often as plural dependencies). Plurals often consist of the noun plus suffix *-en*, preceded by the definite article *de* (e.g., *het paard* 'the horse', *de paarden* 'the horses'), and hence grammatical trials consisted of plural nonsense nouns combined with the correct article *de* (e.g., *de* kagg*en*) while ungrammatical trials consisted of plural nonsense nouns combined with the incorrect article *het* (e.g., *het* kagg*en*).

If children have acquired the dependency between the article *het* and the suffix *-je*, they should listen longer to grammatical than ungrammatical trials. Our results show that this is indeed the case. In addition, the control study revealed that children did not listen longer to *het*-initial NPs when the dependency was ungrammatical, ruling out the possibility that children simply prefer *het* over *de*. Taken together, this indicates that sensitivity to remote dependencies at an early age is not restricted to verbs only and depends on frequency of occurrence. Moreover, these results are particularly interesting because Dutch-learners at this age have yet to acquire the adjacent dependencies between articles and nouns (Johnson & Diks, 2005), suggesting that it is easier to learn the nonadjacent but frequent dependency between article and diminutive suffix than the adjacent but less frequent article - bare noun dependency. We are currently testing younger infants to determine when this sensitivity to article-suffix dependencies first develops.

P3-1

Non-visual joint attention and early language acquisition

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Joint attention, two people looking at and paying attention to the same thing, has been linked to early language acquisition (Tomasello & Farrar, 1986). A young child more easily learns words when adults who are talking tune their content to a child's focus of attention (Adamson, Bakeman, & Deckner, 2004; Tomasello & Farrar, 1986). However, in groups it is more difficult to clearly establish visual joint attention or to maintain visual joint attention for as long as is typical in one-on-one interactions (e.g. in triads, Tomasello, Mannle, & Kruger, 1986). Akhtar (2005) suggests that in cultures with group childrearing some other mechanism must facilitate early language acquisition. Research looking at blind children learning to talk has called for a widening of the idea of joint attention beyond the visual definition it typically has. In this study we examine non-visual ways of sharing attention (which may be more useful in groups where dyadic joint visual attention is less frequent) and their relationship to early language. We ask the question: are non-visual ways of sharing attention also related to language acquisition?

Children ages 5 to 30 months were observed in two studies as they interacted in groups during everyday activities in child care. Group size averaged 7.5 children with 2 teachers. In study 1, looking at concurrent relationships between joint attention and language, 10 children were observed and their language development was assessed within one month. In study 2, looking at delayed effects, 7 children were observed three times over 8 months; their language was assessed later with a delay of 7, 12, and 15 months. Behaviors were coded either live (study 1) or from videotape (study 2) for 45 minutes per child per observation. Non-visual joint attention behaviors coded were: physical contact and moving toward another person. For comparison, we also coded visual joint attention. Children's parents completed the MCDI and a questionnaire on vocabulary milestones.

Physical contact, moving toward another person, and visual joint attention were all positively correlated with measures of vocabulary both concurrently and at times 7 to 15 months later. The more that children and/or teachers used these behaviors in group situations, the earlier and/or more advanced was children's vocabulary development. (Concurrent correlations of shared attention with vocabulary measures: $r = .81$ physical contact, $r = .78$ move toward, $r = .75$ visual joint attention; Delayed correlations averaged: $r = .63$ physical contact, $r = .55$ move toward, $r = .59$ visual joint attention.)

While this is a small sample, it shows clearly that visual and non-visual ways of sharing attention in groups are related to early language development. Through physical contact or moving closer to others children are perhaps able to tune in to the focus of language around them or signal to others that they are prepared to tune in. It seems that the process of sharing attention during language exchanges is the critical element in supporting language acquisition, rather than the modality (visual, tactile, or proximity) through which the attention is shared.

P3-2

Affect attunement during early mother-infant interaction: How specific intensities predict the stability of infants' coordinated joint attention skills

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Background: Coordinated joint attention (CJA) represents intersubjectivity and drives language development (Carpenter et al., 1998; Tomasello & Todd, 1983). Many theorists have proposed a predictive relationship between emotion sharing/affect attunement and CJA (Adamson & Russell, 1999; Hobson, 1993; Rochat & Striano, 1999; Stern, 1985, 1995, 1999; Tomasello et al., 2005; Trevarthen, 1993). This study examines the putative nature of this relationship: Does the intensity of early caregiver-infant affect attunement, before the emergence of CJA, predict the stability of CJA skills later?

Methods: Fifteen mothers-infant dyads participated in object-mediated free-play at 6, 9, and 12 months of age. Mother-infant interaction was captured utilizing split-screen video. Data was microanalytically coded for affect attunement at 6 and 9 months and CJA at 9 and 12 months. Affect attunement was measured utilizing affect-intensity matching (neutral, low-, moderate-, and high-positive intensity) occurring within a 2-second window during mutual-engagement time (ME-time). The percent of ME-time dyads demonstrated low- and moderate-intensity affect matching were the primary predictor measures. The primary outcome measure was the mean length of CJA episodes at 12 months, representing the stability of CJA skills. CJA was measured utilizing a well-replicated coding scheme (Adamson, et al., 2004; Bakeman & Adamson, 1984; Carpenter et al., 1998).

Results: Multiple regression indicated that low-intensity affect matching at 6 months positively predicted, and moderate-intensity affect matching at 9 months negatively predicted CJA at 12 months ($R^2 = .604$, $p < .05$). On average, dyads with frequent low-intensity matching at 6 months and infrequent moderate-intensity matching at 9 months had longer CJA episodes later. Further, frequent low-intensity matching and infrequent moderate matching at 9 months predicted longer CJA episodes on average ($R^2 = .625$, $p = .003$). A combined quantitative and qualitative analysis indicated that infants with poorer CJA skills at 12 months exhibited, on average, more moderate-intensity affect matching at 9 months, intensity mismatching, and gaps in ME-time.

Conclusion: Findings both support and extend the long-standing theory regarding a predictive relationship between affect attunement and intersubjectivity. Findings suggest that shared, pleasurable, low-intensity emotional states support social-cognitive development before and during the emergence of CJA; whereas moderate-intensity affect attunement may do the opposite. The authors theorize that the purpose of affect attunement shifts from understanding others' emotions to understanding others' attentions during object-mediated mutual engagement between 6 and 9 months of age, and that the modulation of optimal emotional states create greater processing capacities for infants to learn intersubjectivity.

P3-3

The acquisition of internal state words in early mother-child interaction in German

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Word learning is often conceived as a purely cognitive, if not innately given process. Thus, theories of word learning focus predominantly on words which have a perceivable correlate in the world outside. However, the so called internal state words which express emotions, physiological states, desires, obligations, volitions, and cognitions express entities one cannot easily refer to as visible and touchable entities. In order to understand how children acquire these words, it is helpful to take into account Bühler's language theory, according to which each linguistic sign has not only a referential, but also an expressive and appealing function. The social and cognitive aspects of this theory have been elaborated within the differing versions of a social-pragmatic view, stressing the interpersonal dimension of word learning. However, in these accounts the emotional side of interpersonality has rarely been addressed.

Our study focuses on the use of internal state words by children of 15, 18, 24, 30 and 36 months and their mothers (33 dyads) in highly emotional situation. All internal state words uttered by the children and their mothers were evaluated and coded with respect to their frequency, their content and the word's referent. Each term was classified according to one of the following categories: "emotion", "physiology and perception", "modality and moral", and "cognition". We investigated the developmental course of internal state word acquisition and tested whether gender and attachment-type of the child contribute to differences in internal state language acquisition. Additionally, correlations between the mothers´ and the children's use of internal state language were ca.culated.

The results point to developmental sequences in the children's acquisition of internal-state language, according to which the earliest and most strongly represented domains are those of physiology and perception, followed by emotion and modality, cognition emerging last. Frequency and content of children's internal state words underwent age-related changes, whereas mothers´ use of internal state words remained fairly constant over time. The reference of the children's internal-state words was ambiguous in the beginning, later they referred to internal states of themselves, of others, and of objects. In contrast, mothers used internal-state words almost exclusively to refer to their children's states. These findings suggest that the input has a data delivering and a fine-tuning function.

Quantitative results capture only a static picture of internal state language in an emotional situation. Therefore, the quantitative analysis will be accomplished by more fine-grained analyses of the dialogic interplay between mother and child in the emotional situations. It will be illustrated how mothers and children negotiate the meaning and connotations of internal state words, and how they attune their perspective on emotional events thus creating a common ground which provides the words with shared meaning.

P3-4

Mother and child conversations on agent and action information during joint picture-book reading

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Background and aim: This study investigated the sequential structure of mother–child conversations during joint picture-book reading; mother–child pairs were longitudinally observed when children were 20 and 27 months of age. Unlike previous studies focusing on the sequence of labeling utterances by mothers and children, this study examined the sequence of utterances about agent and action information in the pictures to clarify how children develop linguistically from the single-word stage to the syntactic stage.

Method: Eighteen pairs of Japanese mothers and children were longitudinally observed when children were 20 and 27 months of age. The pairs were given a picture book depicting 24 animals engaged in everyday behavior. Maternal utterances preceding and following children's information-giving utterances on agent and action in the pictures were analyzed. Maternal utterances preceding children's information-giving utterances were coded as "information giving" and "information asking". Maternal responses following children's information giving were coded as "imitation", "elaborative information giving", "elaborative information asking", "instructional feedback", and "interpersonal feedback".

Key results: On average, the pairs initiated 70% of episodes by giving or asking for information about the agent. The pairs were divided into a more linguistically advanced children group and a less linguistically advanced children group based on the productive vocabulary size of each child at 20 months of age. From 20 to 27 months, the group of more linguistically advanced children decreased the proportion of agent information giving that imitated information given by mothers, while the less linguistically advanced group increased the proportion of this type of agent information giving. In both groups of children, information giving on action that imitated maternal information decreased from 20 to 27 months. In addition, in both groups of children, the proportion of imitation and elaborative information giving by mothers in response to children's information giving about the agent decreased from 20 to 27 months. In contrast, the proportion of elaborative information asking by mothers in response to children's information giving about the agent increased from 20 to 27 months. There was no difference in maternal responses to children's information giving on action at 20 and 27 months of child age.

Conclusions: The results indicate that children in this age range first acquired the ability to give information by imitating information given by their mothers; as their linguistic ability developed, they could then produce utterances without imitation. As the children developed, the mothers decreased imitation responses and changed the way they elaborated on their children's utterances about the agent; that is, instead of giving elaborative information themselves, they asked the children to give the elaborative information.

P3-5

Look at that nice dog! Parents' use of language to direct children's attention to the world

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Children's early language reflects their cognitive and linguistic status as well as their interests in the people, animals, and objects in their world. In this paper we consider the possible role of parents in shaping those interests. This study concentrates on specific verbal instructions to pay attention to things in the world. We investigate the use of the expressions "look at…" and "see the…" in speech to infants and young children. Our aim is to discover what parents are telling children to pay attention to, what the resulting vocabulary in the parents' speech is, and how it can be characterized.

Data were drawn from the CHILDES database, including a variety of cross sectional and longitudinal corpora (e.g., Bernstein Ratner, Bates, Brown, Brent, Higginson, Warren). There were a total of 71 children, ranging in age from 11-48 months. The CLAN program COMBO was used to extract all instances of "look at" and "see the" from the transcripts. Next, 855 instances of the parent using these phrases to tell the child to attend to something were identified. Targets were coded in multiple ways, including for explicitness ("look at that" vs. "look at the doggie"), and for animacy, manipulability, frequency, and other lexical measures.

Overall, 70% of these phrases were to "look at" something, and 30% were to "see" something. The objects of these verbs were overwhelmingly (83%) substantive; purely deictic expressions ("look at that!") were more common in speech to the youngest children. References to living entities, especially animals, were very frequent in all corpora. Parents called attention both to the children themselves and to salient aspects of the environment, largely ignoring enduring but unchanging features such as walls and floors, unless these had special features: " Look at the *shiny* rocks."

Given these findings, we should not be surprised that children's early vocabulary reflects many of these attentional targets. Children are not blank slates, of course, and may be predisposed to attend to entities that are, e.g., animate. Parents may be helping children to structure their world by directing their attention to some things, but not to others.

P3-6

Do types of givenness influence children's word order?

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A fundamental principle that guides constituent ordering has to do with information status, the accessibility of referents in discourse. Typically, adults order previously mentioned referents ("old" or accessible information) first, before they introduce referents that have not yet been mentioned in the discourse ("new" or inaccessible information). If similar considerations influence how children linearize their thinking for the purposes of speaking, we would predict that accessibility should lead to an "old-before-new" ordering preference in children as well. In addition, the "old-before-new" ordering in adults' usage patterns constitutes input to children learning language, and may also lead to an early preference for an old-before-new ordering in children. However, prior experimental research shows that this is not the case. When asked to describe two objects in a container (one of which was "old", having been seen and labeled immediately before), children have a preference for naming the new object first, whereas adult controls exhibit the predicted "old-before-new" pattern (Narasimhan & Dimroth, 2007). Thus, while accessibility does influence word order use in 3-5-year-old children, their ordering preference is opposite to that of adults.

These results are unexpected in light of prior research showing that children's spontaneous discourse typically conforms to other principles of information structure, such as topic-before-comment (de Cat, 2004). Here we ask whether children are more likely to switch to the adult-like "old-before-new" pattern if the "old" object is not simply seen and labeled but is additionally made a discourse topic. Seventeen 3-5-year-old children acquiring German were first shown one object (e.g. a flower) and asked to label it (as in the study by Narasimhan & Dimroth, 2007). But in the present study, the experimenter also provided additional comments about this object (e.g. "Looks pretty, doesn't it?"). Children were then shown a pair of objects, one of which was the "old" object (e.g. a flower and a cap) and asked to describe what they saw. Surprisingly, children continue to exhibit a non-adult-like newness preference (e.g. "flower and cap") even when the "old" referent was made a discourse topic.

Our findings suggest that despite its pervasiveness in adult speakers, the "old-before-new" pattern does not appear to have its roots in early child language. Children's preference for the "new-before-old" pattern remains robust, even when there is discourse encouragement to construe the old referent as, not only "old", but also topical.

P3-7

A developmental study of subject omission in child English

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While previous research has demonstrated the effects of discourse-pragmatics on argument realization in null subject languages (e.g., Clancy, 1993; Allen, 2000; Serratrice, 2005) and in non-null subject languages (e.g., Guerriero et al. 2006; Hughes & Allen, 2006), only recently has work been done that looks at subject omission developmentally from a discourse-pragmatic perspective. In two studies, the discourse-pragmatic features of *person* and *newness* were found to have a developmental effect (Guerriero et al. 2006; Serratrice, 2005). However, questions still remain as to how the characteristics of omitted subjects become more adult-like over time in terms of children's pragmatic awareness. This study investigates subject omission developmentally in a non-null subject language looking at six different discourse-pragmatic features in an attempt to address this question.

The present study examines 4296 referential subjects produced by four monolingual English-speaking children between the ages of 2;0 and 3;1, videotaped in hour-long spontaneous interactions with their mother and/or a familiar researcher. Consistent with the hypothesis that cognitive development is a crucial factor in referential choice, the children's utterances were analyzed for subject omission at two different age ranges: Time 1 (T1) from 2;0 to 2;7 and Time 2 (T2) from 3;0 to 3;1. The data were then coded for sentence-level, grammatical, and discourse-pragmatic information for each utterance containing a verb. Based on Allen (2000) and Hughes & Allen (2006), discourse-pragmatic information was encoded by a set of six binary features which predict the accessibility of a referential argument (i.e., *person, absence*, *newness*, *differentiation in context*, *differentiation in discourse*, and *joint attention*).

In line with previous findings, results demonstrate that all four children's rate of subject of omission falls over time. At T1, the four children omit subjects at an average rate of 28%, whereas at T2, the children omit subjects at an average rate of 8% (See Table 1). Furthermore, the type of subjects omitted at T2 indicates that the children's sensitivity to certain discourse-pragmatic features has developed and become more adult-like. The proportion of null subjects that are third person decreases across all four children from 45% at to T1 to 25% at T2. Most subjects omitted at T1 are grammatically illicit and are often third person. However, subjects omitted at T2 are for the most part first or second person. When third person omissions do occur, they are largely instances of self-talk while the child narrates play with inanimate objects.

In addition, the proportion of null subjects that have 'inaccessible' values decreases for all features by at least one-half between T1 and T2. The data in this study suggest that at around age 3, children's cognitive abilities become more developed so that they have a greater sensitivity to discourse-pragmatics as well as a better understanding of the linguistic conventions of the target language. This study will examine the relationship between age, cognitive ability, and linguistic ability and their combined effect on argument realization in child language.

P3-8

Resolution of null pronouns in a discourse-configurational language

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The paper deals with the puzzle which children acquiring a subject-drop language face when it comes to determine the proper antecedent of a third-person null pronoun at the discourse level. As a discourse-configurational language without a nominal case system, Bulgarian offers a good opportunity to investigate the impact of discourse-related factors on the acquisition of null anaphors.

We report results from two series of combined production and comprehension experiments. The production of null, personal and demonstrative pronouns in subject position was assessed through an elicited-imitation task. In the comprehension part, the child was asked to identify the referent of the pronoun.

The first series compared the anaphora resolution of 3- and 5-year-old Bulgarian children with respect to the reference accessibility factors 'animacy' and 'syntactic role' of the antecedents. The results show that 3-year-old children preferably produce utterances with null pronouns using verbal agreement morphology to license subject-drop. The abundant production of null pronouns, however, is not associated with a clear co-reference establishment. Animacy of the referent is the main salience factor younger children rely on for each of the tested pronouns, but it does not suffice to disambiguate the referent of a null pronoun. The impact of animacy is

continuously strengthened and modified with age, turning into a preference for animate subjects as antecedents of null anaphors in the 5-year-old group. Interpreted in terms of semantic roles, the results suggest that agentivity is the underlying disambiguation factor of non-overt anaphors.

The second series investigated the interaction of agentivity with the antecedent properties subjecthood and topicality. We varied word order and morpho-syntactic topic marking (clitic doubling), contrasting them with the establishment of a single referent as a discourse theme. The obtained comprehension pattern reveals that younger children preferably choose the referent which is established as discourse topic by means of all preceding context sentences. The 5-year-olds employ more structural information for the determination of the possible discourse topic as referent of the null pronoun. They prefer referents with convergent salience cues, but also exhibit sensibility to the morpho-syntactic marking of sentence-initial object topics.

In order to achieve a resolution pattern comparable to the way adult Bulgarians comprehend null anaphors, children have to find out that they acquire a discourse-configurational language. It is not merely the grammatical subject which is left out; on the higher level of representation, the referent of a non-overt anaphor is associated with the discourse topic. Unless the Bulgarian-learning child gains knowledge about both functions of word order and overt topic marking strategies (clitic doubling), he/she cannot cope with the informational load of non-overt elements.

P3-9

Input adaptation effects: The case of connectives

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Some researchers (Diessel, 2004) suggest that the order of emergence of different connectives is strongly influenced by the frequency of the same structures in the input, particularly in the mother's speech. However, Evers-Vermeul (2005), who studies the acquisition of connectives in English and Dutch, suggests that the relation between input and order of acquisition cannot be discussed by taking into account global numbers of frequencies, since it is possible to find in the mother's data effects of adaptation to the child's speech.

We used a spontaneous production corpus of monolingual acquisition of European Portuguese (three children, 1;5.9 – 3;11.12) and analyzed the production of the connectives *e* (and), *mas* (but), *porque* (because) and *se* (if) both in the child's speech and in the mother's speech. Evers-Vermeul hypothesis was tested by applying a linear regression model (in SPSS) to the proportions of production of each connective (after a logit transformation was done) and using as predictor variables (i) Time (1 unit = 1 month) and (ii) the proportion of connectives produced by the child (when analyzing mother's data) or the proportion of connectives produced by the mother (when analyzing child's data).

The results show that Time explains the variation both in child's speech and in mother's speech ($p < .001$); moreover, the proportion of connectives in child's speech explains the proportion of connectives in the mother's data (e.g. production of *mas*, $p < .05$). The fact that the proportion of connectives in mother's data grows with time creates a methodological problem to studies which use the global frequency in the input as a factor explaining the order of acquisition: this would only be possible if the input was stable or if its variation was indeterminate.

P3-10

21-month-olds understand the co-operative logic of requests

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One of the most prominent ways in which humans communicate cooperatively is by requesting help. The ability to respond appropriately to requests requires an understanding of their logic and cooperative nature. Little is known about when and how an understanding of requests develops in ontogeny. In the present study we investigated 21-month-olds' understanding of one of the felicity conditions of requests, namely that people do not request things they can do without considerable effort.

In each of three experimental conditions (n = 16 per condition), infants were presented with an adult sitting at a table and directing an ambiguous request for an object to them. There were two candidate objects: one was located on the table directly in front of the adult (close object) while the other was located out of the adult's reach on another table at a distance of about 2m (distant object). Both objects were equidistant from the infant's position. In the Hands-Free Condition, the adult's hands were free so she could easily grasp the close object when she requested the infant to help her and give her 'the' object. In the Hands-Occupied Condition, the adult made the same ambiguous request, but her hands were occupied so that the close object was just as inaccessible for her as the distant one. In the Free-Choice Condition, the adult's hands were free, but instead of making a request for help, the adult asked the infant to choose an object for herself.

Independent-samples t-tests revealed that infants in the Hands-Free Condition (Mean = .5) chose the distant object significantly more often than infants in the Hands-Occupied Condition (Mean = .23, $t(30) = 2.36$, $p = .025$), and more often than infants in the Free-Choice Condition (Mean = .23, $t(30) = 2.91$, $p < .01$). Infants' choices in the Hands-Occupied and in the Free-Choice Condition did not differ significantly ($t(30) = .0$, $p = 1$). These two conditions revealed a strong general bias towards the object that was close to the adult.

These results suggest that 21-month-old infants understand that a person requesting help is unlikely to refer to something she can easily accomplish herself (here: reach for the close object). Instead, she must be referring to something she could not do without noticeable effort (here: fetch the distant object). Infants at this age thus already possess some basic understanding of the logic of requests including the underlying felicity conditions and the cooperative nature of requests. Consequences for the understanding of the three basic assumptions of communication - cooperativeness, rational agency and relevance – will be discussed.

P3-11

On the acquisition of a non-scalar quantity implicature: The "Allover Implicature"

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Previous studies on the acquisition of conversational implicatures following from Grice's (1959) Maxim of Quantity suggest that quantity implicatures are acquired as late as 9-years (e.g. Noveck, 2001, Papafragou and Musolino, 2003). However, these studies concentrate on scalar implicatures. This paper presents a novel study on the calculation of a NON-scalar quantity conversational implicature, referred to as the 'Allover Implicature' (AI) (Levinson, 2000) in adult and child Hebrew. Utterances including (certain types of) adjectival phrases, such as 'green skirt', result in the calculation of the AI 'green = completely green'. Our results show that children as young as 3-years can calculate the AI. We thus argue that implicatures arising from the Maxim of Quantity are acquired much earlier than previously suggested.

Two experiments were administered to 33 typically-developing, monolingual-Hebrew-speaking children aged 2;11 – 8;5 (fourteen 3-4 year-olds, ten 5-6 year-olds and nine 7-8 year-olds) and 12 adult controls. The first experiment tested knowledge of AIs in basic (e.g. 'blue') adjective constructions and the second in resultative (e.g. 'dotted') and denominal (e.g. 'flowery') adjective constructions. Both experiments used a picture-selection task including two conditions: the AI-condition and the 'partially'-condition. There were 5 items per condition in the first experiment and 9 items per condition in the second. Each target item consisted of one target picture and three distracter pictures. In the AI-condition the target was a completely colored/patterned (striped/dotted/flowery) object, while the distracters included at least one object partially filled with the same color/pattern. For the 'partially'-condition, the target was a partially colored/patterned object, while the distracters displayed the same objects with different colors/patterns. There were five filler items where the target was a colored/patterned object and the distracters were different objects of different colors/patterns.

Our results show that adults consistently calculate the AI, selecting the completely attributed object in the AI-condition (100% and 99.1% for experiments 1 and 2, respectively) and select the partially attributed object in the 'partially'-condition (100% and 95.4% for experiments 1 and 2, respectively). Children, from the age of 3, showed (near-) adultlike calculation of the AI in experiment 1, choosing the completely attributed object in the AI-condition (3-4 year-olds: 81.4%; 5-6 year-olds: 96%; 7-8 year-olds: 100%). For experiment 2, calculation of the AI appeared more gradually (3-4 year-olds: 66.7%; 5-6 year-olds: 86.7%; 7-8 year-olds: 95.1%). Like adults, children chose the partially attributed object in the 'partially'-condition consistently from the age of 3 for experiment 1 (94.3%, rising to 96% and 97.8 % for the 5-6 year-olds and 7-8 year-olds, respectively) and slightly less consistently for experiment 2 (3-4 year-olds: 60.7%; 5-6 year-olds: 83.3%; 7-8 year-olds: 91.4%). The poorer performance on experiment 2 is attributed to the resultative and denominal adjectives developing later than basic adjectives in Hebrew (e.g. Berman, 2004).

In conclusion, our results show that children from the age of 3 show knowledge of the AI. This is support for pragmatic knowledge; at least for (quantity) conversational implicatures far earlier than demonstrated by previous studies into (scalar) quantity implicatures.

P3-12

Preschoolers' use of referring expressions in speech and in gesture: Sensitivity to extralinguistic context

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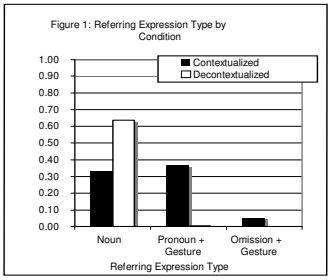
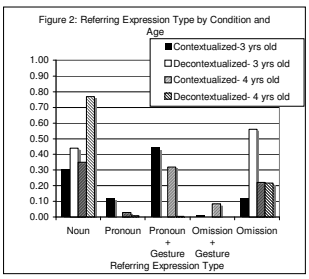
Adults vary their referring expressions depending on extralinguistic context. If communication partners share an immediate extralinguistic context, adults can use lighter linguistic forms, such as pronouns or omissions, to express referents in the shared context. In these situations, even if referents are expressed with lighter forms, relying on the extralinguistic context by using gestures is sufficient to make the referents clear. However, if there is no shared immediate extralinguistic context that can be relied on, adults can then shift to a decontextualized communication strategy, and use solely the linguistic medium to convey meaning, independent of the context. Such flexible use of different referring terms requires sensitivity to listeners' knowledge states. Different than adults, preschoolers have difficulties in assessing knowledge states of others. However, preschoolers might reveal sensitivity to their listeners in communicative contexts earlier than other contexts. The current study aimed to investigate to what extent preschoolers vary their use of referring expressions in speech and in gesture depending on the availability of a shared immediate extralinguistic context between themselves and their listeners.

To answer the question above, we tested 20 Turkish-speaking children around 3 to 4 years of age in two different conditions. All children were asked to describe short vignettes. In one, contextualized condition, 10 children had a picture and a computer screen with a scene from the vignette available during retelling. In the other, decontextualized condition, other 10 children were asked to describe the same vignettes without the book or the screen available to them. Children's speech and gesture were then transcribed. Referring expressions in speech and gesture were identified.

We hypothesized that children would be sensitive to presence of a shared immediate extralinguistic context. Thus, children in the contextualized condition (CC) were expected to rely on context, use lighter forms and accompany them with gestures, which would in turn make the referent of the referring expression clear, more frequently as compared to children in the decontextualized condition (DC). Preliminary data confirms our prediction. Children in CC indeed rely on pronouns and omissions accompanied with gestures more frequently as compared to children in DC (Figure 1). We also hypothesized that children in DC would rely less on context, and provide more specific linguistic forms, such as nouns, to express referents more frequently as compared to the children in CC. This prediction is also confirmed by the preliminary data (Figure 1). In addition, results reveal a difference between 3- and 4-year-olds. 3-year-olds in DC 1) do not differ from 3-year-olds in CC in terms of nouns as substantially as 4-year-olds do, and 2) produce more omissions as compared to the 3 year-olds in CC. In other words, when context support is removed 3-year-olds do not provide as much information about the referents (Figure 2). In sum, results suggest that preschoolers can vary their referring terms depending on the availability of shared extralinguistic context.





However, 4-year-olds might more successfully adjust to absence of context that could be used to share the load of linguistic medium.

P3-13

Referent introduction in stories by children and adults

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This poster will compare adults' and children's performance on a measure of referent introduction for use with the Edmonton Narrative Norms Instrument (ENNI; Schneider, Dubé, & Hayward, 2003). The measure, First Mentions, can be used to evaluate the referring

expressions that a child uses to introduce characters and objects when telling a story. Referring expressions are linguistic forms used to refer to animate beings (*the elephant, Ella, she*), objects (*the train, it*), and other entities. They are considered adequate if appropriate for the listener's knowledge, shared context, and preceding linguistic context. For example, an indefinite noun phrase such as *an elephant* is appropriate for a new character in a story in the absence of a shared context, while *the elephant* or *she* would only be appropriate for mentioning the character subsequently. Young children frequently introduce referents in a confusing way, often using pronouns. Later, they may use definite NPs, which are not fully adequate but do provide some information. The ability to introduce referents appropriately develops gradually through the early school years.

The ENNI measure First Mentions was developed as an assessment tool which distinguishes among fully, partially, and inadequate referents. In a previous study, while the measure successfully discriminated between children with and without language disorders, there was little change in scores of older typically developing children. In order to determine whether the First Mentions measure is useful at older ages, it is necessary to have information on adult storytelling in the same context. The purpose of this study was to investigate whether this measure would reveal progress in referent introduction development past 9 years old.

Participants for the study were 10 adults aged 25-33 who told the 6 stories in the ENNI. Their stories were scored for First Mentions and compared to the stories of 50 typically developing children aged 9 from the ENNI normative sample. A statistical test revealed that adults had higher First Mentions scores than 9-year-olds, with a large effect size. Thus, although children's referent introduction does not appear to change from ages 7-9, the First Mentions measure is able to document changes that take place from this age to adulthood.

P3-14

The acquisition of object clitics by child L2 learners of Greek

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The present paper examines the phenomenon of argument (direct object) and clitic production/omission in the interlanguage of Turkish-speaking child L2 learners of Greek. The phenomenon of clitic omission in L1 acquisition is well documented in several Romance languages and the reasons have been attributed to both representational and processing accounts (Jakubowicz & Nash to appear, Schaeffer 2000, Wexler to appear). In (child) L2 acquisition clitic omission has been associated with the presence of functional categories at the initial stages (White 1996) and the transfer of L1 properties that leads to misanalysis of the L2 input due to the unavailability of uninterpretable features in the L2 (Towell & Hawkins 1994, Tsimpli 2003) or to the inability to spell-out morphophonologial features of existing underlying representations (Herschensohn 2004).

In this paper clitic production is examined as a subset of argument realization. Direct object clitics have been treated as determiner like elements, i.e. D-elements (Postal 1969; Abney 1987) with uninterpretable phi-features (case, number, gender) (Tsimpli & Stavrakaki 1999), which undergo further syntactic movement both as an XP/X element (Mavrogiorgos 2005 for Greek). In Turkish D-linked pronominal objects are expressed through the licensing of a null element (*pro*). Turning to child L1 Greek it has been reported that clitics are produced from early on and there is no clitic omission stage (Tsakali & Wexler 2003).

In the current study seventy-nine child L2 (age of exposure after 5 and 6 years old) Turkish–speaking L2 learners of Greek of different proficiency levels (low, intermediate, upper intermediate and high) were examined on the production of direct object arguments and object clitics using a story-telling task, and a combination of a truth-value and elicited production task (Schaeffer 2000). Clitic production was measured in two ways: (i) as a proportion of the total verbal complements produced and (ii) on the basis of 'clitic context' (Pirvulescu 2006). Child L2 learners were compared to MLU- (n=18) and age-matched (n=50) child and adult (n=10) L1 speakers.

Results showed that child L2 learners exhibit the same sensitivity to factors influencing object realization as the L1 speakers. Namely, object realization was found to be influenced by the verb's situational and grammatical aspect and by individual properties of the verbs. At the same time child L2 learners produced a significantly lower rate of object clitics. The present results suggest that L2 children do not exhibit problems with argument realization, but that with the spell-out of a morphophonologically 'deficient' element such as the clitic. This omission in Greek did not correlate with the development of C-domain (Müller and Hulk 2001), as clitics continued to be omitted even when the C-system had been acquired. In contrast also to other languages where clitics in child L2 learners has been examined (cf. French, Prevost 2006) no correlation was found between optional infinitives, whose production was very low in child L2 (Varlokosta 2002), and object clitics, as subject-verb agreement was acquired far before object agreement markers (clitics). The current results seem to suggest that clitic omission is contingent upon the representational 'deficiency' of clitics (Jakubowicz & Nash to appear), as well as the fact that they are licensed with optionally transitive verbs under specific discourse properties, constituting thus a complex interface phenomenon (Sorace 2005).

P3-15

Mandarin speaking children's sensitivity to word order in sentences

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Most languages are generally assumed to have a basic word order, in particular the order of the major constituents of the clause (subject, object, and verb). Word order plays an important role of describing who does what to whom, especially in languages that are not highly inflected, like English, or have no inflectional affixes, like Mandarin Chinese.

Studies investigating English learners have found that 17-month-old infants are sensitive to word order in active reversible sentences (Gertner et al., 2006; Hirsh-Pasek & Golinkoff, 1996). Little is known about young learners of Mandarin Chinese, whose development of attention to their canonical SVO word order may be affected by the pervasive nominal ellipsis allowed in Mandarin. That is, if many utterances in Mandarin are missing the relevant arguments (Lee and Naigles, 2006), how might child learners of Mandarin determine what the canonical word order is? If understanding of word order is acquired solely from fully specified input (i.e., many SVO utterances), then Mandarin learners should demonstrate this relatively late in development; in contrast, if such understanding can develop based on only fragmentary input, then Mandarin learners should demonstrate this close to the same age as English learners.

Our participants included 16 21-month-old children (nine boys) (range 17-26 months, *M* =21;25 months, *SD*=4.02) and eight 3-year-old children (four boys) (range 32-35 months, *M*=34;8 months, SD=1.26). They were recruited and tested in Taiwan; all were acquiring Mandarin as their first language. The stimuli were presented with the intermodal preferential looking paradigm (IPL). Five child-familiar verbs were tested (*push, pull, kiss, hug, ride)*; their actions were performed by people dressed in horse and bird costumes. All of the verbs were tested in the same format. First, children heard a nondescript audio (e.g., "Oh, pushing!") and saw the horse pushing the bird on one screen. Then the same audio was presented again but children saw the bird pushing the horse on the other screen. During the third (control) trial, both videos appeared with the same nondescript audio. During the next (test) trial, both video scenes appeared again with the test audio (e.g., "Look! the bird is pushing the horse!"). Children's visual fixation time on each screen was calculated as the dependent variable.

Thus far, the 3-year-olds looked significantly longer at the matching screen during the test trials (M = 53.69% of total looking time) than during the control trials (M = 46.86%; $p < .05$). A similar pattern was seen for the 21-month-olds (M (test) = 52.44%, M(control) = 46.64%); this effect approaches significance ($p = .10$). Because of our low power, data collection is still continuing. However, it appears that Mandarin-speaking children as young as 21 months old can understand their canonical SVO word order with familiar verbs, and thus they seem able to abstract this canonical word order from fragmentary input.

P3-16

Linguistic interfaces and pure syntax in simultaneous and early sequential bilingualism

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On the basis of developmental data pertaining primarily to the interface between syntax and discourse/pragmatics, Sorace (2005) has hypothesised that, contrary to pure syntax, interfaces between syntax and other linguistic/cognitive systems may not be completely acquirable in (broadly defined) bilingual language development. In addition, Tsimpli & Sorace (2006) have argued that external interfaces (i.e. those between syntax and modules outside the language faculty), such as the discourse-syntax interface, are more problematic than the internal ones (i.e. those between syntax and other components within the language faculty), such as the semantics-syntax interface. By contrasting the ultimate attainment of the lexical semantics-syntax interface and pure syntax in simultaneous and early sequential bilingual acquisition, this paper examines whether the two domains in question are acquirable to the same degree or not.

The paper contrasts the acquisition of auxiliary selection with intransitive verbs and of auxiliary change under restructuring in compound tenses in Italian. While the former phenomenon depends on aspectual and thematic factors, and thus qualifies as a phenomenon at the lexical semantics-syntax interface, the latter one is determined by purely structural factors, satisfying the criteria for a purely syntactic phenomenon. More precisely, the consistency with which different lexical-semantic classes of unaccusatives (*arrivare* 'arrive') and unergatives (*parlare* 'talk') select one of the two auxiliaries depends on the agentivity and telicity of the verb/predicate (Sorace 2000), while the optional or obligatory change of *avere* 'have' into *essere* 'be' in restructuring constructions with unaccusative infinitival complements hinges on the presence and the position of the adverbial clitic (*Lui ha/è voluto andare a casa,* 'He wanted to go home', *Lui ha/è voluto andar**ci**, Lui **ci** *ha/è voluto andare,* 'He wanted to go there') (Rizzi 1978). The phenomena under scrutiny are not instantiated in Croatian, which is the (other) L1 spoken by bilingual participants in the study, excluding the effects of language transfer.

Three groups of children, aged 13-14, performed an acceptability-judgement task, in which their judgments were elicited by means of the Magnitude Estimation technique: simultaneous bilinguals, near-native early sequential bilinguals (child L2 learners) and monolinguals. The responses of both bilingual groups patterned with those of the monolinguals with respect to auxiliary selection with intransitive verbs, but diverged from them with regard to auxiliary change under restructuring: neither of the bilingual groups distinguished between the three syntactic conditions regulating auxiliary change under restructuring, allowing optional auxiliary change in all three cases, including the one in which the change is obligatory. This indicates that, contrary to predictions, pure syntax is more problematic than the lexical semantics-syntax interface in bilingual language acquisition, at least as far as the phenomena under scrutiny are concerned. It is argued that this is primarily due to a difference in the input frequency of the two phenomena, the purely syntactic one being less frequent. Such findings underline the role of input factors, in addition to structural factors, in language acquisition, and the existence of important parallels between different types of bilingual language development, such as simultaneous and early sequential bilingualism in this case.

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P3-17

Variables and resumption in child Spanish

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Background: Previous studies have established productive use of non-target resumption in child relative clauses crosslinguistically (Perez-Leroux 1995). Perez-Leroux 1995 takes such overproduction of resumption to be the consequence of an underspecified [+/- variable] value for the pronominal. Thus, children use pronominals as variables in quantificational chains (Lasnik: Stowell 1991). While they master movement, they have not acquired the [-variable] value of pronominals. A crucial aspect of this hypothesis is the prediction that resumption will appear in questions as well as relatives. The study reported here is a pilot investigating resumption in child Spanish questions in the light of Perez-Leroux's hypothesis.

The study: PART I: Questions: The aims were: i) to test the existence of resumption in questions; ii) to test the effect of discourse linking (d-linking) and establish whether d-linked wh-phrases (*cual*=which) are more likely to be resumed by a pronominal; ii) to test whether a pronominal was more likely in embedded positions (under an infintival clause or a declarative (*que*="that"-clause). The experiments crossed the following factors: EMBEDDING (0,1) XCLAUSE (*infinitive,that-clause*) X D-LINKING (*cual,que*). The methodology involved an elicitation task based on Thornton (1996) and an acceptability task based on McKee&McDaniel (2001). We tested only linguistically encoded d-linking (cual vs. *que*); all referents of questioned wh-items were introduced in the story/space of interaction and were, in this sense, contextually salient. The task targeted object questions. Data were collected in a nursery outside Madrid; 14 monolingual children aged 3-6 took part in the study.

PART II: Relative Clauses: The aim was to test whether i) resumption was more likely in object positions in relative clauses than questions and ii) resumption was more likely in non-argument positions. An elicitation study was designed eliciting three types of relatives according to the relativisation site: i) direct object, ii) possessor, iii) locative.

Results: No child or adult control produced any pronominal element in any question; all elicited questions involved traces. Consequently, there was no interaction between resumption and any of the experimental factors. Further, occasionally, children and adults produced clefted questions (``who was that kicked the ball'') in the d-linked condition (i.e. when the prompt invoved *cual*). In the acceptability task, adults generally rejected questions with pronominals. Children, however, accepted pronominals in questions at higher rates, in particular when the pronominal was embedded. The acceptance of pronominals was higher for youngest children. The

elicitation of relative clauses revealed that the gap strategy was the dominant for both adults and children for the case object relatives (only 4 items out of 20 involved a resumptive pronominal or full NP). By contrast, both adults and children exhibit a dominant resumptive strategy for possessors (21 out of 29 items involved resumption); the dominant strategy for locatives is a gap one (17 out of 27 items) which however is absent from the adult data.

Conclusion: Our results indicate that children know the [-variable] value of pronominals and do not use them in questions or, indeed, direct object relatives. The absence of a d-linking effect on resumption does not necessarily indicate that children are not sensitive to the discourse properties of *cual* and *que*. The production of clefted sentences in the *cual* condition, which, in Spanish favours an ``identification" reading can explain the occurence of clefted questions. Following McKee&McDaniel 2001, we take the discrepancy between production (elicitation task) and comprehension (acceptability task) of questions to indicate that the pronominal facilitates processing in comprehension. All in all, the data indicate that the grammar of child Spanish is mainly one of intrusive resumption; resumption is reserved for embedded positions in questions (only for comprehension) or relativised non-arguments. We relate this contrast between questions and relatives to the involvement of a non-agreeing complementiser (que) in relatives which forces resumption for the LF identification of nominal features for non-arguments (Suner 1999).

P3-18

Agreement, subsets, and N-Drop in French child language

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It has been argued (Barbiers 1991, Kester 1996a, b) that agreement operations are at the source of N-Drop. Languages with strong overt agreement in the DP, like Spanish and Dutch, allow N-Drop, while languages with week agreement, like English, do not (Sleeman 1996; Snyder, Senghas, & Inman, 2001).

(1) a. *Ik neem de oud**e** auto*.
'I take the old car'
b. *Ik neem de oud**e** __*.
'I take the old __.'
c. *Quiere la manzana verde y yo la __ amarilla*.
'S/he wants the green apple and I the yellow __.'

Examining the problem from the perspective of language acquisition, Snyder et al.'s (2001) longitudinal study of two Spanish-speaking children (aged 1;7-4;0) shows that the first cases of N-Drop occur only once agreement markings are fully mastered, leading to the conclusion that agreement is a necessary condition for N-Drop.
However, French only allows N-Drop with a sub-class of adjectives called ''classifying" adjectives (Barbaud 1976) in spite of the fact that all adjectives agree in number and gender with the noun:

(2) a. *Je veux la____ verte*
'I want the green one'
b. **Je veux l'____ intéressante*
'I want the interesting one'

This has led some researchers to argue that the licensing conditions for French are different (i.e. not agreement-based) than those for the above languages (Sleeman 1993).
In this paper we present a unified analysis of N-Drop with support from French child data.
Closer examination of the Spanish acquisition data seems to indicate that it is the acquisition of the *determiner* system, rather than agreement per se, that is the main factor affecting this structure, as the earliest manifestations of agreement are on determiners. Both longitudinal and transversal data of child spoken French corroborate this assumption.

While our examination of 15 children aged 1;8-3 years reveals that the determiner system is mastered at around 1;6, no delay is found between N-Drop and the production of agreement features on determiners, pronouns, and attributive adjectives. Furthermore, in this transversal corpus, the first clear case of N-Drop (1;8 *L'autre* __ 'The other (one)') precedes the first clear case of the agreement marking on an adjective (i.e. the use of the feminine form *verte* 'green' at 2;2). In the longitudinal corpus (a study of the CHILDES corpus for Pauline), the first clear cases of N-Drop occur at the same time as the first cases of agreement, making a cause-effect relation difficult to establish. Moreover, noun agreement with predicative adjectives and past participles appears significantly later that the first cases of N-Drop (1;8 vs. 1;5).

In support of our analysis, no clear case of N-Drop was found with non-classifying adjectives in either corpus. Our findings are compatible with Bouchard's (2002) analysis of N-Drop in French and English. According to Bouchard, atomization of a DP (i.e. the selection of a subset from a superset) is achieved through the number feature, which is marked on the determiner in French, and on the noun in English. As a consequence, the noun can be omitted in the former (the denotation being retrieved through context) but not in the latter. This analysis generalizes to Dutch, where adjectival morphology plays the role of a focus marker (REF), while the Spanish data is revisited along the lines of Lujan (REF) who argues that the determiner in N-Drop constructions is in fact a pronoun that recovers the denotation of the nouns.

P3-19

Accounting for L1 acquisition patterns of the passive and impersonal constructions in Serbian construction conspiracy vs. a chain maturation

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This paper investigates L1 acquisition patterns of the passive and impersonal constructions in Serbian in the light of the current debate regarding what influences guide the L1 acquisition process. These constructions overlap in function and have been analysed in the literature as two types of the passive: the participial (*Uliks je napisan od strane Dzojsa*, 'Ulysses was written by Joyce') and the reflexive passive (*Kuca se zida*, 'One is building the house'). Therefore, their acquisition patterns could also be expected to be similar. However, the current study found that their acquisition patterns are in fact very different and endeavours to account for this by considering several factors proposed so far to guide L1 acquisition.

Importantly, this paper argues that several morphosyntactic criteria identify the reflexive passive as an active transitive construction with a suppressed subject, i.e. as the transitive impersonal (TIMP) and not as the passive (PASS). It is in fact structurally,

morphologically and semantically more similar to the intransitive version of the impersonal (IIMP, *Leti se ide na more*, 'One goes to the seaside in the summer') and to the transitive active (ACT, *Zidari zidaju kucu*, 'The builders are building the house').

Three studies were conducted: two comprehension experiments using sentence-picture matching tasks with 164 children aged 2;7 to 6, and an analysis of a corpus of Serbian child and child-directed speech comprising data of 8 children aged 1;8 to 4. The studies compared acquisition patterns of PASS and TIMP and made additional comparisons with IIMP and ACT. It was found that TIMP is successfully comprehended and produced significantly earlier than PASS and equally early as IIMP and ACT.

An assumption of representational innateness and an analysis of the passive in terms of movement and a-chains could lead to an explanation along the lines of e.g. Wexler (1999) who argues that such constructions are acquired late due to late maturation of a-chains. This would explain early acquisition of TIMP which could be argued to lack a-chains. However, this paper argues that a maturational account faces a number of problems, not least those of biological plausibility as well as of crucially requiring theory-internal assumptions to sustain it.

Instead, this paper advocates a usage-based account, which views L1 acquisition as a learning process sensitive to morphological, semantic and frequency properties of the input. Indeed, the current study has found important input frequency differences between TIMP and PASS, the former being more frequent and therefore more easily accessible for acquisition. However, an account based on the frequency of constructions in isolation cannot explain why IIMP is acquired earlier than PASS, as they are equally infrequent.

A more satisfactory explanation follows the Construction Conspiracy Hypothesis (Abbot-Smith and Behrens 2006), according to which constructions can support each other in acquisition through morphological similarity. In the case of Serbian, TIMP, IIMP and ACT form such a supporting relation, which accounts for the fact that IIMP is acquired early despite being relatively infrequent on its own. However, a comparison of the current data with a set of related data from Russian suggests that morphological similarity alone is not sufficient for facilitated acquisition, but that simultaneous semantic similarity is also required. The paper discusses the implications of these findings for the usage-based approach and for the nature of the language learning process.

P3-20

Finiteness and resumption in child Spanish

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Background: This poster deals with the use of pronouns or empty categories in Null Operator structures (NOS) and their relation to finiteness. Specifically, we focus on degree clauses (see (1) and (2)).

(1) la jirafa es muy alta para que el pájaro la bese
the giraffe is too tall for the bird it.fs kiss.3s.pres.subj.
(2) la jirafa es muy alta para besar (la).
the giraffe is too tall for kiss (it)
´the giraffe is too tall to kiss / for the bird to kiss it´

Spanish has both finite (subjunctive) NOS (1) and non-finite ones (2). Pronominals are obligatory in finite clauses, but optional in non-finite clauses and required only in cases of potential ambiguity. No ambiguity can arise in finite clauses, given the explicitness provided by overt agreement on the verb and the (obligatory) pronominal. In non-finite clauses, on the other hand, the syntax allows the matrix subject to be interpreted as the subject or the object of the embedded clause ("subject" and "object" reading). So in (2) the giraffe could be either the "kisser" or the "kissee". In the gap variant of (2) there is a preference for the subject interpretation. An overt object pronoun in (2) enforces the object interpretation.

The study aims at testing the role of finiteness and resumption in the interpretation of degree clauses, particularly in the association of the matrix subject with the embedded object.The test factors were +/- finiteness and +/- resumption. The methodology used was a Truth Value Judgment task based on Crain & Thornton 1998 and Anderson 2005. The (verbal and non-verbal) context forced the object reading. The results are from a pilot which tested 15 3-6 year old children at a nursery in Madrid as well as a control group of 4 adults.

Results: The adults exhibit a sharp contrast between finite and non-finite clauses: target interpretation is unproblematic with finite clauses; but with non-finite clauses there is a bias towards subject readings (The proportion of object readings reaches 88% in finite clauses vs 65% in non-finite ones) The presence of an overt pronoun, does facilitate the object reading, but the bias towards subject readings is still evident (The proportion of object interpretations is 63% in clauses with gaps and 67% in those with overt pronouns).

The older children (age 5-6) pattern with the adults and so do, to a lesser degree, the g 4-5 year olds. The youngest children (age 3-4) appear unable to evaluate the entire structure and to evaluate the predicate instead (e.g. in (2) whether the giraffe is tall or not).

Conclusion: The results indicate that children (from 4 onwards) are sensitive to finiteness and to the presence or absence of a gap or a pronominal. When faced with optionality and ambiguity, they resort to default strategies that favour subject resolutions of A-bar chains (and lead them to garden paths). Degree clauses are acquired much later than other A-bar dependencies (questions, relative clauses) which can be explained by cognitive delays in the semantics of degree clauses

P3-21

An acquisitional perspective on English expletive construction

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This study tests the acquisitional predictions of Freeze's (1992) account of existential constructions. Freeze claims that existentials are derived through locative inversion, as seen clearly in the following Chamorro examples
:

(1) a. Baige gi gima' si Juan. (V Locative Theme)
Be P house UNM John
'John is in the house.'
b. guäha lahi gi gima. (V Theme Locative)
be man P house
'There is a man in the house.'

The existential in (1b) differs from (1a) primarily in that the Theme and Locative have been inverted.

The acquisitional prediction is basically that the child must know about locative inversion in order to have existential constructions. More precisely, the child acquiring English will acquire presentational locative inversion (PLI), as in *Here is a book*, at least as early as

expletive constructions (EXPL) like *There is a book on the desk*. Across children, we predict the following: the age for PLI should be ≤ the age for EXPL. Hence, there should be a significant ordering effect by binomial test and paired *t*-test.
To test these predictions I examined the longitudinal corpora for 12 British children and 7 American children from the CHILDES database (MacWhinney 2000). I focused on PLIs (with at least three-words) and EXPLs like those in (2):

(2) a. Here + N (crucial evidence for PLI)
b. There + N + locative (crucial evidence for EXPL)

The results consistently supported the predictions. First, none of the children got Expl significantly earlier than PLI by Binomial Test, despite the fact that the two constructions are acquired very close together and despite the fact that several of the children got PLI significantly earlier than Expl. Second, The ordering of first use of PLI prior to first use of Expl was significant by two-tailed, paired *t*-test. ($p = 0.049$).

Notice that the ordering effect of PLI ≤ EXPL does not appear to be a simple reflex of MLU. This is illustrated by the following child Adam.

(3) Adam's PLI and Expl word count of each sentence:
a. Length of four PLI before first Expl: 11/6/5/5, mean length = 6.75
b. Length of four PLI after first Expl: 5/7/5/6, mean length = 5.75
c. Length of two Expl: 5/6, mean length = 5.5

In (3), the mean length of PLI before or after the first Expl appears is longer than the mean length of Expl. In fact, none of Adam's PLI's is shorter than his Expl's. If the ordering effect were simply due to MLU, we definitely shouldn't expect Adam's PLI to appear earlier than his Expl. But by the binomial test, there is a significant gap between Adam's PLI and Expl ($p < .001$). That is, his PLI appears significantly earlier than Expl, even though the mean length of PLI is longer than the mean length of Expl. This shows that the ordering effect cannot be simply due to the effect of MLU. The significant gap should be caused by something else, like the lack of necessary grammatical knowledge for Expl construction.

P3-22

Early VP ellipsis: Comprehension evidence

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The literature suggests that children as young as 3 years old comprehend and produce VP ellipsis (VPE) (Postman et al. 1997, Thornton & Wexler 1999, Foley et al. 2003, Matsuo & Duffield 2001, Matsuo 2007). Santos (2006) argues that children acquiring European Portuguese produce VPE in answers to yes-no questions (MLUw around 2) and suggests that children derive from general innate principles the identification constraint on VPE (a semantic constraint, Merchant 2001). However, Grodzinsky (2005) argues that there is not sufficient evidence that children's interpretation of VPE environments is constrained in the same way as adults' interpretation. This would undermine the idea that children have innate knowledge of the identification constraint on VPE.

The present study shows that children do constrain their interpretation of VPE, as expected. A Truth Value Judgment Task was applied to 35 children (4 to 6 years old). It shows that children are at ceiling in rejecting sentences such as (1) in A contexts and well above chance (around 70%) in rejecting it in B contexts, which are similar to Grodzinsky's contexts, confirming an adult interpretation.

(1) O crocodilo estava a dar comida ao leão e o cão também
the crocodile was PREP give food to+the lion and the dog also
estava.
was
'The crocodile was giving food to the lion and the dog was too.'

A: The crocodile was giving food to the lion but the dog wasn't.
B: The crocodile was giving food to the lion and the dog was giving food to the crocodile.

P3-23

Acquisition of universal quantifier-negation scope interaction in bilingual children

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This study investigates Korean-English (K-E) bilingual children's acquisition of scope interaction between quantifiers and negation in English, using the Truth Value Judgment Task methodology of Crain and Thornton (1998). The K-E bilinguals in our study show different developmental patterns from those reported for monolingual children in previous studies (Musolino 1998; Kim *et al* 2003). I argue that transfer of the syntactic position of the Korean negation to English explains this result.

Korean and English differ with respect to possible scope interactions of QNPs and negation. Both a wide scope reading and a narrow scope reading are allowed for subject QNPs and object QNPs in long form negation in Korean as represented in (1). On the other hand, only a narrow scope reading is possible for object QNPs in English (2a) but subject QNPs can take either wide or narrow scope (2b).

(1) a. Miki-ka **motun** orenci-lul sa-ci **anh**-ass-ta (∀>neg, neg>∀)
Miki-nom **every** orange-acc buy-ci **neg-**pst-decl
b. **Motun** mal-i wultali-lul num-ci **anh**-ass-ta (∀>neg, neg>∀)
Every horse-nom fence-acc jump.over-ci **neg**-pst-decl
(2) a. Mickey didn't buy every orange (neg>∀, *∀>neg)
b. Every horse didn't jump over the fence (∀> neg, neg>∀)

The experiments were designed as partial replications of Musolino's (1998) work on English L1 acquisition of quantifier-negation interaction. I tested 15 5-7-year-old K-E bilingual children. The experiments were designed to test two factors with two levels each: scope difference (neg>∀ vs. ∀>neg) and grammatical position of QNPs (subject vs. object). I found that bilingual children allowed both a wide scope reading (100%) and a narrow scope reading (80%) for subject quantifiers interacting with negation. This result contrasts

with Musolino's (1998) study where only 10% accepted a narrow scope reading in subject condition. In addition, K-E bilingual children accepted a wide scope reading (100%) as well as a narrow scope reading (73.7%) in object condition, revealing their non-target scope ambiguity.

I suggest that the account of why the K-E bilinguals allow scope ambiguity follows from the structural position of Korean negation, which is argued to adjoin to either VP or V^0. This system is transferred to English and interferes with the acquisition of the English system, where negation takes a higher position in the structure**.** For example, the non-target scope ambiguity of object QNPs is derived from the transferred negation positional flexibility as represented in (3).

(3) $[_{TP}$ Mickey$_1$ did $[_{VP}$ **not** $[_{VP}$ every orange$_2$ $[_{VP}$ t_1 $[_{V'}$ $[_{V}$ (**not**) buy] t_2]]]]]

The negation wide scope reading is derived by adjoining negation to VP. Adjunction of negation to V^0 leads to the wide scope reading of object QNPs over negation.

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P3-24

Finiteness and tense – two problems in language acquisition

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There is some debate on to what degree children, especially children with SLI, have difficulties with the structural realization of finiteness (e.g. Hyams 1996), tense (e.g. Leonard et al., 2003) or agreement (Wexler et al., 1998). In many languages, finiteness is grammatically realized at the verb, which at the same time carries tense marking. This has led to the common view that tense is an essential aspect of finiteness. However, as we do know, not all languages exhibit tense and, moreover, not all languages exhibit tense inflection at the verb, whereas, on the other hand, all languages exhibit structural means to oppose finite and non-finite utterances. Finiteness is defined by Klein (2005) as a semantic-pragmatic notion of validity (assertion). It is grammatically realized on the sentence level by certain kinds of structural linking of the topic element/phrase and the predication including the lexical verb and its arguments. The grammatical means for this structural linking vary across languages, e.g., word order (verb position), functional particles or inflections. Tense, on the other hand, is defined as the relation of utterance time and reference/topic time (Reichenbach 1947, Klein 1994).

According to these definitions, children have to learn two different concepts and their language-specific linguistic expression. By discussing longitudinal data of three German-learning normally developing children at age 2;0-2,4 and one SLI child, we will argue that finiteness and tense emerge in subsequent developmental steps, at least in German. Children first acquire grammatical means for expressing finiteness contrasts before acquiring grammatical means for expressing tense contrasts.

The first step in the acquisition of linguistically expressed finiteness in German is the V2 vs. Vlast contrast. Initially, the V2 position is filled with modals, copula verbs and auxiliaries, but also particles and negation words. Only later in development, children produce finite lexical verbs in V2 position (Jordens 2002). The respective verb forms are used in only one of the target tense forms, i.e., no tense contrast is expressed in this early phase of V2-Vlast opposition. In accordance with e.g. Wagner (2001), we argue that the inflectional contrasts of target present tense and past participle forms (*machen*-INF – *macht*-3P-SG – *gemacht*-PASTPART 'do') are of aspectual nature. Non-present-tense forms first emerge with copula verbs in formulaic constructions (*das war* 'this was' or *war das* 'was this'). The emergence of tense with lexical verbs requires the production of analytic verb forms. It is argued that a tense contrast is acquired in German when children productively use lexically atelic/imperfective verbs in the perfect construction.

In the normally developing children, we find a one- to three-month period from the acquisition of the finiteness contrast to the acquisition of the tense contrast. In the SLI child, the whole process takes more than one year. It can be shown that both acquisition of the finiteness contrast (V2-position) and acquisition of the tense contrast (analytic verb constructions) build special problems for the SLI child, with tense as the much more difficult notion to acquire.

P3-25

Bilingual two-way immersion benefits academic achievement

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Previous research has found that bilingual status impacts cognitive, linguistic, and academic performance. In order to examine the effect of bilingual education on academic achievement, we compared standardized test scores obtained from elementary school children across different bilingual programs and a monolingual General Education setting. Specifically, we compared scores of English-native students and Spanish-native students in Two-Way Immersion programs (TWE and TWS, respectively), Spanish-speaking students in a Transitional Program of Instruction/English as a Second Language program (TPI/ESL), and English-speaking students in General Education classrooms (GE).

To examine the impact of different bilingual education programs, IMAGE Reading and Math scores were compared across Spanish-native children in Two-Way Immersion programs and Spanish-native children in Transitional/English as a Second Language programs using a one-way ANOVA. Collapsed across all grades, students scored similarly on Math and Reading measures. However, examination of each grade individually showed that in third grade, TWS and TPI students performed similarly on the IMAGE exam, while in fourth grade, TWS students scored significantly higher than TPI students on measures of Reading skill, and in fifth grade, the TWS students scored significantly higher than TPI students on a number of scores measuring both Math and Reading skills. This suggests that while Spanish-native students in Two-Way Immersion and Transitional English programs perform similarly early on, Two-Way Immersion students show an advantage in both Reading and Math by fifth grade. This greater rate of growth for Spanish-native students enrolled in a Two-Way Immersion program relative to their peers in a Transitional Program of Instruction suggests that bilingual TWI programs can boost achievement on standardized testing.

Moreover, not only did the Two-Way Immersion program benefit native Spanish speakers, it also had a positive impact on native English speakers. A MANOVA comparing Math scores (ISAT and IMAGE) from 1513 students across grades three, four, and five showed that English-native Two-Way Immersion students outperformed General Education students on measures of Math skill, suggesting that Two-Way Immersion programs have an overall positive impact on both English- and Spanish-native students. However, while Spanish-native Two-Way Immersion students outscored their Spanish-native peers in the TPI/ESL program, their scores were lower than those of English-native students in both General Education and Two-Way Immersion programs. This finding suggests an

advantage for native-English students in U.S. elementary schools, regardless of program. Together, data from the present study provide evidence of enhanced academic achievement for students enrolled in Two-Way Immersion programs, compared to their peers with the same language background. These results provide support for the use of Two-Way Immersion as the program of choice for both English native and non-native students.

P3-26

Towards a better understanding of insufficiency in first language vocabulary knowledge: A case of second generation of Russian-Jewish immigrants in Israel

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The topic of immigration must inevitably focus on home language (L1) maintenance in the context of governing status and overwhelming presence of host country language (L2). If it is true that the second generation inevitably exhibits insufficient knowledge of home language vocabulary vs. monolingual L1-speakers educated in an L2 non-additive context, our knowledge concerning specific lexical domains that constitute a challenge for this population is still rather limited and inconsistent. The present study was constructed with the goal of thoroughly evaluating vocabulary knowledge in the home language, in a large-scale sample of second-generation Russian-Jewish immigrants in Israel. The interest in this research population might be attributed to the unique demographic, socio-cultural, linguistic, and psychological distinctiveness of Russian-Jewish immigration in Israel, which considerably contributes to heritage language transmission.

The present study was guided by the following two research questions: (1) Do young Russian-Hebrew speaking bilinguals show any significant differences in L1 vocabulary knowledge compared to L2? (2) If yes, what are the specific L2 lexical domains that constitute a challenge for lexical knowledge acquisition in the heritage language? Note that our main concern was examining bilinguals' knowledge of meaning levels of a lexical unit, in particular, two fundamental types of sense relations: *paradigmatic* and *syntagmatic*.

Participants in the study were 70 Russian-Hebrew speaking children with a mean age of 7,2 (years, months). The children were selected from 24 classrooms in L2 elementary schools located in similar neighbourhoods in the northern region of Israel. The following tests were administered in Russian and Hebrew: word description with and without stimulus questions, semantic associations, antonym knowledge, semantic categories knowledge, and Peabody.

The results indicate insufficiency of home language lexical knowledge in terms of both paradigmatic and syntagmatic sense relations. In particular, the second generation showed rather weak knowledge of superordinates in Russian compared to Hebrew. In addition, the bilinguals demonstrated similar knowledge of vocabulary in L1 and L2 only in three out of ten semantic domains (home cleaning tools, sewing tools and furniture), while the major differences were obtained for knowledge of the names of flowers and trees. At the same time, our findings showed that the bilinguals' performance on the receptive vocabulary measure in the home language was significantly superior to the second language. These findings are discussed in light of their implications for a linguistic-educational approach to bilingual children, suggesting practical strategies for promoting L1 development among second-generation immigrants.

P3-27

Cognitive inhibition in monolinguals and successive bilinguals

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Research comparing the cognitive abilities of monolinguals and bilinguals has often found a bilingual advantage on tasks requiring inhibition (Bialystok, 2001). Such studies were most often done with simultaneous bilinguals, who had acquired both languages from an early age. The current research explored the inhibitory abilities of a different group of bilinguals: those who had begun learning a second language after their first language was established. This study investigated the effect of bilingualism on Grade 2 children's performance on two tasks of inhibition. English monolinguals (n =21) and successive Chinese-English bilinguals (n =21), ages 7-8, completed the Simon task and a picture-word Stroop task. Both tasks required the inhibition of perceptual attributes of the stimuli; certain conditions of the picture-word Stroop task also required inhibition of conceptual information. In the Simon task, children were required to ignore salient spatial cues and respond only to stimulus colour. As expected, both the monolingual and bilingual groups in this study showed faster RTs on the condition that did not involve a spatial conflict than the one that involved a spatial conflict. In contrast with previous research findings, however, a bilingual group advantage was not observed on this task. In the picture-word Stroop task, children had to name pictures with or without incongruent words written inside. The distracters in different conditions were hypothesized to access the semantic/conceptual level to varying degrees, in accordance with a connectionist model of language processing. Across all participants, real-word distracters were associated with lower accuracy and slower RTs than all other distracters. In general, RT interference varied with the nature of the distracter: words that accessed the semantic level more directly were associated with greater interference, and words that did not access the semantic level produced less interference. No monolingual-bilingual group differences were observed on this task. This study illustrates the feasibility of applying connectionist processing models to language tasks of inhibition. Implications of these results for current explanations of the bilingual inhibitory advantage are discussed.

P3-28

Home language use and family structure as influences on bilingual development

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Background: In bilingual households, individual family members may be bilingual or may predominantly use only one of the two languages spoken. The goal of the present study was to explore how patterns of bilingual language use within households affects children's early bilingual development.

Methods: Sixty-two children (37 males and 25 females) acquiring English in bilingual homes in South Florida participated. All children were between 16 and 30 months of age (Mean age = 22.55 months, SD = 3.90). In 22 of the homes, the language other than English was Spanish; other second languages included Portuguese, Creole, Hebrew, French, and others—all in small numbers. The children's primary caregivers filled out the English-version of the Bates-MacArthur Communicative Development Inventory (CDI) and provided information on the home language environment via a 100-item structured interview. Measures of the percent of time children heard English overall and in conversation with individual family members were drawn from the interview responses. The focus of the present analyses is on language use with siblings.

Results: The overall percent of English language use at home was a positive and significant predictor of toddlers' English vocabulary percentile scores, r (60) = .34, p = .003. Children who had older siblings (M = 30.36, SD = 25.49) had higher English

vocabulary percentile scores than children without older siblings (M = 20.74, SD = 20.38), t (60) = -1.65, p = .05 (see Figure 1). Among the 28 children with older siblings, the percent of time English was used with siblings was also a positive and significant predictor of English proficiency (r (28) = .41, p < .05, see Figure 2). When language use with siblings was categorized as English, Other, or Mixed (English and another language), this variable also showed a significant relation to the toddlers' English percentile scores. For children with older siblings, English vocabulary scores were higher for children who spoke to their sibling(s) in English (M = 45.45, SD = 27.88) than for children who spoke to their sibling(s) in another language (M = 5.00, SD = 0.00) or a mix of English and another language (M = 20.00, SD = 19.58), F (2, 26) = 5.21, p < .01, one-tailed (see Figure 3).

Discussion: For very young children in bilingual homes, older siblings appear to be a significant source of input in the majority language, with the result that those who have older siblings are more proficient in the majority language than young children without older siblings. Analyses in progress are investigating the effect of language use with other family members and are examining the Spanish proficiency of children in Spanish-English bilingual homes.

Figure 1.

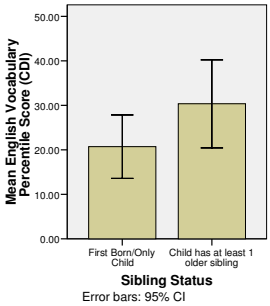


Figure 2.

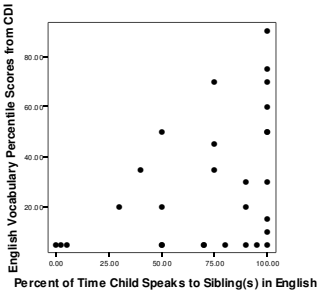
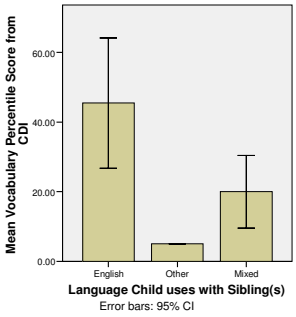


Figure 3.



P3-29

Language exposure and development in bilingual Basque children

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According to the separate development hypothesis (De Houwer, 1990; Meisel 2001; Müller & Kupisch, 2003) bilinguals acquire their languages in the same way as monolingual subjects do, independently of the specific skills they may develop. But to what extent does the amount of input influence the pace of linguistic development? Do bilinguals with differing amounts of input develop the same degree of competence at the same age as monolinguals do in their respective languages? These are the issues that will be examined here.

Our data proceed from the CDI2 questionnaire (Fenson et al. 1993) adapted to Basque (Barreña et al. 2008, in press). Data from 956 questionnaires based on parental reports were statistically treated. Basque children, grow up in more or less bilingual communities where Basque co-exists with Spanish or French. Based on these questionnaires our subjects were grouped according to exposure to Basque in more than 90%, in 60 - 90%, and finally those with 40 - 60% of exposure to Basque.

Previous research has shown that although the CDI2 includes ages 16-30 months significant differences related to input only appeared in the age span 26-30 months, particularly in the group with less exposure to Basque. But although these data show globally lesser values for the 40 -60% group a closer analysis revealed that some of the subjects had developed vocabulary, morphology and syntax at the same pace as those exposed to greater amount of input (Almgren et al. 2006). The present study will focus on such data from the 40-60% exposure group at the age of 26-30 months.

For our analysis MLU and global lexical mass values were picked out from all the items available in the data from CDI2 as being indicative of degree of syntactic and lexical development as shown by Bates et al. (1994), Marchman & Bates (1999) for English, Devescovi et al. (2005) for Italian and Barreña et al. (2007) for Basque.

The present study will show the extent to which the subjects who attained values similar to those exposed to a higher degree of input were nearer to the 60 % ceiling. This could mean that input is a determining factor. If on the other hand this is not the case, data would show dispersion on the 40 to 60 scale. It would be interesting to explore the possible reasons for such dispersion, for instance individual differences.

P3-30

The influence of trajectory of bilinguals' development on their creative abilities

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This project explores the hypothesis that bilingualism encourages divergent thinking and cognitive flexibility, which together facilitate creative thought. The study is part of a larger research program designed to examine the factors in bilingual development that contribute to potential advantages in cognitive and creative abilities.

A previous study conducted with Russian-English bilinguals living in the US, revealed that three factors in bilingual developmental (linguistic proficiency, age of second language acquisition, and the rate of exposure to the new cultural environment) significantly contribute to their greater ability to activate multiple unrelated concepts from different categories simultaneously. However, bilingualism was found to have no significant contribution to originality in thinking.

That study was replicated with Farsi-English bilinguals providing more control of the participants' performance. Thirty-six Farsi-English bilingual college students living in the UAE were compared with 38 monolingual Farsi native speakers living in Iran. Self-report questionnaires were used to assess participants' cultural and linguistic background. Language proficiency was assessed using a modified version of the Picture Naming Task, in which participants' knowledge of English and Farsi was evaluated by scoring the number of correct responses to the pictures presented. Divergent thinking abilities were assessed with the Abbreviated Torrance Test for Adults (ATTA), which measures verbal and non-verbal fluency, flexibility, elaboration, and originality. Finally, IQ was measured by the Cattell culture fair intelligence test.

An ANCOVA showed that when the effect of the IQ was partialed out, bilinguals significantly outperformed their monolingual counterparts on the ATTA measure of originality ($F(1,71)=5.51$, $p<.05$). This finding contradicts the previous conclusion that bilingualism

does not directly contribute to creativity, but may only lay the foundation for basic cognitive processing. However, a multiple regression analysis revealed that none of the proposed three factors in bilinguals' development can explain their superiority on the originality trait. At the same time, similar to the previous study, these factors were found to influence fluency and flexibility in thinking.

The results are discussed in terms of whether bilingualism has a direct effect on creative thinking and the consistency of the divergent thinking performance differences of various types of bilinguals. The latter confirms the prediction of the previous study that cross-linguistic and cross-cultural factors in bilingual development may facilitate the spreading activation, which consequently may encourage divergent and creative thinking. The following discussion presents the model of language mediated concept activation in bilingual memory, which may cause a larger spreading activation span that engages more unrelated concepts from different categories in the simultaneous processing.

P3-31

Emotions of bilingual and monolingual children: A cross-linguistic perception study

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This paper presents a cross-linguistic perception test of child vocal emotions. Two research questions were addressed: 1) whether adult monolingual listeners are more effective in the identification of child affective speech in their native language, and 2) whether there are any differences in the identification of emotions encoded by monolingual and early bilingual children of the same language.

A cross-linguistically comparable corpus of child affective speech was used for the development of the perception test. The corpus consists of five Scottish-French early bilingual children and their twelve monolingual peers, playing four emotions (anger, sadness, fear and happiness) on one neutral utterance. Child average age was 8 years old. The total of 480 stimuli was selected from the corpus. Twelve French and twelve Scottish monolingual adults performed the perception test.

Recognition results were analysed both at the group level and at the individual level for each child. Results showed that child emotions were recognised in their majority. Differences were observed in relation to the language of listeners, the groups of children and the individual speakers. Bilinguals received high levels of identification: they were successful in communicating their emotions in their two languages. Another important observation was that monolingual listeners did not necessarily show higher levels of identification in their own language. Emotions, encoded by children may be sometimes easier for identification in of the languages both for French and Scottish listeners, suggesting that children may show some emotions more in one of the languages.

P3-32

The pace of English language development in internationally adopted children: A role for cognitive ability, but not native language

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Studies have shown that internationally-adopted infants catch up with native speakers during the toddler years (e.g. Glennen & Masters, 2002). Is it only a matter of time for older internationally-adopted children to gain English proficiency? Or do other factors such as native language or cognitive abilities affect their learning?

We examined English language skills in children adopted from Asia and Eastern Europe (EE). We assessed their rate of progress in acquiring English, compared children from EE and Asia to examine whether differences between the language families (or other population differences) might affect the pace of acquisition, and examined the influence of individual differences in cognitive ability on children's English skills.

We assessed English language skills and non-verbal intelligence in children adopted into monolingual English-speaking households in the U.S. The children (N=66) were 2;5-10;2 at adoption (M=5;3) and had been in the U.S. for 5-60 months (M=25). We tested children between the ages of 3;11 and 10;10 (M=7;75) using a non-verbal intelligence test (K-BIT) and two language measures-the Diagnostic Evaluation of Language Variation (DELV; a test of syntactic, semantic and pragmatic development) and the Peabody Picture Vocabulary Test (PPVT).

Raw scores, in conjunction with time, tell us how quickly children are acquiring English, while standard scores (SSs) tell us whether they lag behind age-mates. To explore the pace of English language acquisition we ran a series of stepwise regressions. We used Age of arrival (AoA), time in the U.S. (Time), region of origin, and K-BIT SS as potential predictors of children's vocabulary (PPVT) and oral language (DELV) raw scores. DELV raw scores were predicted by Time (R^2=.23), AoA (R^2=.44) and K-BIT (R^2=.08). PPVT raw scores were also positively predicted by these variables (Time: R^2=.42; AoA: R^2=.21; K-BIT: R^2=.06). On both language measures raw scores were higher in children who had been in the U.S. longer, arrived later (and were older), and/or had higher K-BIT scores.

We then analyzed children's standard scores as a measure of their catch-up. As with the raw scores, native language group (Asian or EE) was not a significant influence. However, cognitive abilities (K-BIT) significantly influenced children's age-relative scores (SSs). Namely, the DELV and PPVT SSs were significantly predicted by K-BIT SS (R^2=.32; R^2=.11, though PPVT was also predicted by AoA: R^2=.50). After three or more years in the U.S. 83% of children with average K-BIT SSs performed at age-level in vocabulary (PPVT) and 67% performed at age-level on the DELV. Only 4% (one child) of the low K-BIT group were performing at age-level on the PPVT, and all were still below age-level on the DELV.

These findings demonstrate that older internationally-adopted children learn significantly faster than younger ones (cf. Snedeker, Geren, & Shafto, 2007) and native language alone does not affect the general pace of English acquisition. Notably, individual variation in cognitive ability significantly influences the trajectory of children's English language development. We are currently exploring whether individual cognitive abilities differentially affect children's English abilities across different ages of arrival.

P3-33

Bilingual acquisition in a codeswitching environment: Effects on ultimate attainment in school-age children

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Bilingual children are often perceived as lacking in both academic and linguistic competency. In a study of over-identification of English Language Learners (ELLs) in special education programs, Artiles and colleagues (2005) found that ELLs prescreened as limited in both English and native language proficiency were the most heavily impacted subgroup. Empirical research on assessments identifying bilingual children as semilingual or "non-nons" have found the instruments to be dramatically flawed (MacSwan, Rolstad & Glass, 2002; MacSwan & Rolstad, 2006). Problems with proper assessment and identification of bilingual students often stem from how little is known about the nature of bilingualism among these students – whether, for instance, children raised in mixed-language environments

in which interlocutors switch between languages, often within the same sentence (a practice known as *codeswitching*, or CS), might have different linguistic profiles from children raised in other kinds of bilingual settings

The present study seeks to evaluate whether ultimate attainment in Spanish and English is negatively affected in school-age children who acquired both languages in a codeswitching environment. All participants in the study were raised in Spanish-speaking households, with varying degrees of English usage reported in daily interactions. Parent survey data provided information regarding the nature of the mixed language environment in which children were raised, the independent variable in the study. Dependent variables include students' proficiency in Spanish and English, as measured by English and Spanish versions of the CELF, WLPB, PPVT, and numerical analyses of natural language samples (*Frog* stories, commonly collected in child language acquisition research) with syntactic, morphological and lexical error rates. Statistical analysis will investigate whether children's performance on the language tests differ significantly according to the degree of codeswitching environment, and whether children raised in a setting with more codeswitching between English and Spanish have higher error rates than others. Additionally, the coded natural language samples will be analyzed for general patterns distinguishing the groups, with the analysis interpreted in the context of current theories of CS (MacSwan, 2004, to appear) within the Minimalist Program (Chomsky, 1995).

The proposed study clarifies significant assumptions about bilingual proficiency, improving our perception and understanding of basic theoretical questions. . More concretely, the proposed study promises to inform issues in assessment, identification, and teaching of bilingual children.

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P3-34

Does bilingualism affect theory-of-mind development? – A study with English-German bilinguals and German monolinguals aged three to four

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Previous research focusing on theory of mind and bilingual language development has yielded mixed results (Goetz 2003). Whereas such studies assorted a selection of false belief tasks, the present study used the theory-of-mind scale by Wellman & Liu (2004) to show bilingual advantages in theory-of-mind development. Our hypothesis that bilinguals outperform monolinguals on the theory-of-mind scale is based on the three assumptions: greater metalinguistic understanding, greater inhibitory control and greater sociolinguistic competence.

In the present investigation 68 three- and four-year-old German monolinguals and English-German bilinguals were assessed on language competence (British Picture Vocabulary Scale by Dunn, Dunn & Whetton 1982) and theory-of-mind competence (Theory of Mind Scale by Wellman & Liu 2004; German version by Kristen, Thoermer, Hofer, Aschersleben, & Sodian, 2006). Bilinguals were tested in both languages, monolinguals only in German. Each experimental group consisted of seventeen subjects (monolinguals vs. bilinguals and three-year-olds vs. four-year-olds). Monolinguals and bilinguals were matched according to age and language competence.

Results are reported for the German testing form. Three-year-old bilinguals performed significantly better than the matched monolinguals on the two most challenging theory-of-mind tasks: the explicit false belief task (t = -2.64; p = .01) and the appearance reality emotion task (t = -2.20; p = .03). At four years of age, the advantage of bilinguals remained significant only for the appearance reality emotion task (t = -2.20; p = .03).

In line with other findings in this area, it can be assumed that bilinguals acquire the concept of mental representations earlier. Understanding this concept is vital for mastering theory-of-mind tasks and it can also be found in related tasks (perspective-taking, ambiguous figures). Precocious bilingual abilities to represent multiple perspectives mentally can be attributed to their exposure to two languages, which makes them aware of this concept earlier than monolinguals. This awareness might lead to the insight that language is arbitrary, and is at the same time facilitated by sociolinguistic interaction with interlocutors of different languages. Our results indicate that monolinguals eventually catch up with bilinguals, but equal competence on the most challenging item of the theory-of-mind scale is not yet reached at the age of four.

P3-35

Branching onsets in Brazilian Portuguese: Acquisition and variation

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This poster discusses the acquisition of branching onsets in Brazilian Portuguese and it also investigates the alternation between CCV and CV syllables amongst children. Sequences of (obstruent+tap) are the focus of investigation. Although there is dispute as to the age that branching onsets are acquired researchers agree that they tend to be acquired at a later stage (Ribas 2006). In order to investigate the acquisiotion of CCV syllables we selected children that had not yet produced any branching onsets and tested their production in pairs of words where branching onsets and single consonants were in contrast: *[br]uxa* "witch" and *[b]ucha* "bath sponge" (<x> and <ch> are both pronounced as an voiceless alveopalatal fricative). An auditory analysis of these pairs of words indicated that children did not produce the branching onset in a word as *bruxa* "witch" so that the words *bruxa* "witch" and *bucha* "bath sponge" would sound the same. However, after experimental investigation - where duration patterns were investigated - we found that children systematically produce a longer vowel in the cases where there should be a branching onset. The strategy of lengthening the vowel in syllables CCV is used as a covert contrast to distinguish CCV syllables from CV syllables (Scobbie et al, 1996). Instead of producing a tap in CCV syllables (*bruxa*) children's strategy is to lengthen the vowel which follows the branching onset. Thus, for children the words *bruxa* and *bucha* are produced differently, although they auditorily sound the same to adult ears. Later on these children acquired CCV syllables

and another experiment was carried out. In the second experiment we investigated the alternation between CCV and CV syllables. The variety where the research was carried out is the state of Minas Gerais. In this variety it is observed amongst the adult population that branching onsets are in variation with a single consonant: *con[tr]a ~ con[t]a* "against". Thus, children are exposed to CV syllables which alternate with CCV syllables, as in the case of *con[tr]a ~ con[t]a* "against", and children are also exposed to CV syllables that do not alternate with CCV syllables, for example in the word con[t]a "s/he tells" (but *con[tr]a). The investigation amongst the adult population showed that branching onset reduction is better accounted for as a case of lexical diffusion (Cristófaro-Silva 2003, Wang, 1969). In the children's data we found similar results to the adult population with regards to the lexical conditioning of branching onsets. Whereas the average branching reduction rate for 25 words was 20,6% there were words which displayed very low rates as 1,3% (dragão "dragon") and words that displayed high rates as 76,6% (refrigerante "soft drink"). This research offers two major contributions to the study of child language acquisition. The first one indicates that vowel lengthening is used by young children as a strategy during the acquisition of CCV syllables. The second contribution shows that young children deal with the variation observed in CCV and CV in a lexical diffusion fashion (Bybee, 2001).

P3-36

Bringing together perception and production: The stop-fricative contrast in the acquisition of Dutch

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Recent research provides increasing evidence that at early stages of word learning, infants do not use all phonological contrasts of their native language to build lexical representations. 14 month-olds show decreased sensitivity to native-language contrasts in a word-learning task (Stager & Werker 1997, Fikkert *in press*) and work on young children's productions (Fikkert & Levelt *to appear*) also suggests that phonological contrasts are introduced into the system step by step. However, most of these studies refer to Place of Articulation (PoA) or voicing features. The acquisition of contrasts with respect to Manner of Articulation (MoA) features has received less attention.

This study examines the acquisition of the stop-fricative contrast by Dutch-learning children. It aims at (a) investigating whether MoA features behave similar to PoA or voicing features in development, and (b) bringing together results from perception and production to further explore the nature of early lexical representations.

To investigate the production of the stop-fricative contrast we analyzed spontaneous longitudinal speech data of six Dutch 1- to 3-year-old children from the CLPF database (Fikkert 1994, Levelt 1994). The consonants in monosyllabic (CVC) and trochaic (CVCV) nouns were coded for their MoA. The results suggest that (a) at the earliest stages of development, consonants within a word share their MoA; and (b) phonological contrasts are sequentially introduced, first in postvocalic and then in initial position. In both positions the first contrast established is between stops and fricatives, where fricatives are often replaced by stops. The reverse substitution pattern is hardly attested, suggesting that fricatives are more marked than stops.

To test children's perception of the stop-fricative contrast we conducted a word-learning task with 16 Dutch 14-month-olds, using the Switch paradigm (Stager & Werker 1997). Infants were either habituated with the non-word *paap*, hearing the non-word *faap* in the Switch-trial, or vice versa. A paired t-test showed no significant result, suggesting that Dutch 14 month-olds are not yet able to use the initial stop-fricative contrast in a word-learning task. However, Dutch-learning 18-month-olds have demonstrated to detect changes in this contrast in a mispronunciation detection task with well-known words (Fikkert, Van der Feest & Altvater-Mackensen *in progress*). As the stop-fricative contrast is first acquired in postvocalic position in children's production data, we are currently testing Dutch 14 month-olds on the word-final stop-fricative contrast in the word-learning task to further investigate the developmental process.

To conclude, the results of the production study show that Dutch children do not use all MoA contrasts from the onset of word production. In addition, the result of the perception study indicates that at least the initial stop-fricative contrast is not used in word learning at an early stage of development. Relating our findings with results of earlier studies, we argue that (a) MoA features behave similarly to PoA features in development, and (b) that children have to build up a system of phonological contrast and that only contrasts already introduced into the system can be used to build lexical representations.

P3-37

The role of Weight-by-Position in the acquisition of trochaic words in German and Spanish

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The present study deals with the acquisition of prominence of stressed syllables in trochaic-shaped words by German and Spanish monolingual and bilingual children, especially focusing on early production of syllabic structure and its integration into prosodic feet. Both languages show preference for trochaic feet, but deeply differ as regards stress assignment, only German adhering to the WEIGHT-TO-STRESS Principle, which assigns primary stress to heavy syllables. The two languages are similar as to the phonetic implementation of stress, the difference in prominence being a question of degree, with vowel contrasts between stressed and unstressed syllables being larger in German, a stress-timed language, than in Spanish, a syllable-timed language. The vocabularies of young children present many monosyllables in German, which accounts for the early acquisition of moraic trochees. In Spanish disyllables outnumber all other word forms. Here we focus on comparable forms, namely disyllables, drawing on data by two Spanish and two German monolingual children, as well as two Spanish-German balanced bilinguals, at ages 1;3-2;5.

According to analyses based on perception, children seem to produce trochees target-like from very early on, i.e. the first syllable being more prominent than the second one. However, acoustic analyses show that a high percentage of words produced as trochees in isolation by the Spanish monolinguals shows a clear effect of final lengthening. Interestingly, for a few months the two monolingual Spanish children compensate final lengthening by adding a glide or an approximant to the stressed vowel. We analyze this as an effect of STRESS-TO-WEIGHT, i.e. "if stressed, then heavy". In the case of German, both children exhibit a similar treatment of the prominent syllable of trochees: only a few syllables with target long vowels are rendered longer than the final unstressed syllables, duration of most stressed syllables being realized by means of a coda.

With regard to the bilinguals, the fact that they acquire codas earlier than the Spanish monolinguals, might lead to assume that Weight-by-Position effects would come up sooner, that is, that these children would make use of codas (consonantal or glides) in order to achieve syllabic prominence in Spanish. However, such assumption is not completely borne out by our data, as they seem to mainly rely on vowel duration in order to promote a syllable to prosodic prominence in the trochees. In some cases they maintain the target coda of the stressed syllable, but they never resort to an added glide the way the monolinguals do. In German, the bilinguals attest the same procedure as the corresponding monolinguals, i.e., they mainly rely on codas to render prominence.

Both the Spanish and German data thus demonstrate that binarity at the level of the syllable is at first reached by means of a branching rhyme, more often than a branching nucleus. In general, a branching nucleus implies the existence of a branching rhyme,

that is, Weight-by-Position overrides intrinsic vowel length. However, in Spanish the bilinguals tend to show a different path to prominence from that of the monolinguals.

P3-38

Whole-word approach in the evaluation of children's phonological development: A cross-sectional study of 60 Finnish children

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The evaluation of children's phonological skills is a challenge for both researchers as well as clinicians. New methods that utilize spontaneous speech samples in the evaluation of children's phonological skills are needed for several reasons. For one thing, the standardized phonological tests developed for children acquiring English are not easily adapted to other language environments. Secondly, the use of standardized tests when evaluating children's phonological skills is problematic, since it is well-known that in picture-naming tests children are more intelligible than in spontaneous speech. The Phonological Mean Length of Utterance (PMLU) method devised by Ingram and Ingram (2001) utilizes spontaneous speech samples and introduces the whole-word approach to the evaluation of children's phonological abilities. One of Ingram and Ingram's original ideas was to be able to capture developmental growth in a child's phonological system with the PMLU method and to be able to present developmental stages similarly to the way that the MLU method presents stages for the children's grammatical development.

The central assessment tool of the method is the *Phonological Mean Length of Utterance* (PMLU), which measures the whole-word complexity for both child and target words. Words are assigned points for both segments and correct consonants. The degree of accuracy in producing the words can be defined with the *Whole-word Proximity* (PWP) value, which is obtained by comparing the child's PMLU to the PMLU of the target word. The third measure, the *Whole-word correctness* value (PWC) defines the number of entirely correctly produced words as related to the entire sample.

This study applies the PMLU method to cross-sectional data of 60 Finnish children. The subgroups of these children are: 15 children at the end of the one-word stage; 15 children at the age 2;0; 15 children at 2;6 and 15 children at 3;0. The data were transcribed phonetically using the International Phonetic Alphabet (IPA) and meaningful words produced by the children were identified following a procedure devised by Vihman and McCune (1994). The analysis was made using the *Phonological Mean Length of Utterance* (PMLU) method (Ingram & Ingram, 2001; Ingram, 2002). The children's PMLU results and related values are discussed together with qualitative remarks on the children's phonologies and the results received in earlier studies with the PMLU method on children acquiring Finnish (Saaristo-Helin, in press; Saaristo-Helin, Kunnari & Savinainen-Makkonen, 2006). In addition, the study discusses the method as related to the possible developmental PMLU stages for phonological development.

P3-39

Tonal Development in Cantonese-English bilingual Children

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This study investigates the longitudinal tonal development of two Cantonese-English bilingual children aged 2;0 to 3;4 and 1;8 to 3;0 respectively. The utterances produced by the children were taken from the multimedia Hong Kong Bilingual Child Language Corpus (Yip and Matthews, 2007). We compare our bilingual children's tonal development with monolingual children in terms of (1) age of first emergence of tones, (2) age of stabilization (accuracy measure) and (3) acquisition order of tones.

Previous studies showed that Cantonese-speaking monolingual children normally master their tonal system by the age of two in both longitudinal studies (So and Dodd, 1995; Tse, 1978) and cross-sectional studies (So and Dodd, 1995). Regarding the acquisition order of tones, these studies show that tones in the high register are generally acquired earlier than tones in the low register, and level tones are acquired earlier than contour tones. Law (2006) investigated the tonal development of an English dominant Cantonese-English bilingual child and reported that a longer period was needed for a complete mastery of the Cantonese tonal system due to prosodic transfer from English.

Our empirical findings show that complete mastery of the Cantonese tonal system by the bilingual children was still not observed at age 3;4. The acquisition order of tones follows the same hierarchy as in Cantonese monolingual children. With respect to the errors made by the bilingual children, the mid-level tone (tone 3) seems to be an unmarked tone which was used frequently by the children to substitute the target tones. Theoretical issues related to the under-differentiation of the Cantonese tonal system by bilingual children will be discussed. In the literature on phonological acquisition, consonant and vowel harmony are frequently used to explain the segmental errors produced by the children. In this study, tonal harmony is proposed to account for some of the error patterns at the prosodic level.

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P3-40

Phonological specificity in 12 and 18 month old French speaking infants

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How infants start to recognize words and build a receptive lexicon still remains a much debated issue. A long standing hypothesis on early word coding has been that words are initially coded in a rather global format, and that the degree of phonological specificity increases under the pressure of vocabulary size or neighborhood density. This theory is now questioned as recent results indicate that, in a referential context, infants as young as 14 months (or even 11 months in one paper) differentiate well pronounced from mispronounced words, even when the 2 phonological forms are highly similar (ex. "baby-vaby" in English). These results suggest that from early on, infants possess a detailed phonological representation of words which enables them to distinguish well pronounced from mispronounced words. However, the available evidence is still limited, as the data concerns only English and Dutch, and the factors that are likely to affect infants' skills in such settings, like the type of substituted phoneme (consonants or vowels), the position of the

substitution (initial, medial and final) and the type of phonological feature substitution (place, nasality, voicing, etc.) have not given rise to systematic investigations yet.

In this paper, we will report the results of 3 experiments performed with 12- and 18-month-old, French-speaking infants using the Intermodal Preferential Looking paradigm. In the 3 experiments, infants were presented pairs of pictures during 3 seconds before a prompt ("regarde!" [look!]) and an auditory stimulus were delivered. This stimulus corresponded to one of the pictures and was either well-pronounced, or mispronounced. Two cameras located below the display recorded the infant's gaze during 7 seconds, and the fixation time on each display was measured before and after the presentation of the auditory stimulus. Experiment 1 involved 23 12-month-olds and 43 18-month-olds. The mispronunciations corresponded to either a modification of one or of 2 phonological features at the onset of the word (for instance, voiture (*car*), foiture [1-off], and soiture [2-off]). The features manipulated involved place, voicing and nasality. The results show that infants look significantly longer (proportional looking time and longest look difference) at the pictures corresponding to well pronounced words than at those corresponding to mispronounced words, both at 12 and at 18 months. By contrast, there is no difference between mispronunciations involving 1vs2 phonological features. This result suggests that as early as 12 months, French-speaking infants distinguish well- from mispronounced words differing by their initial consonant.

In Experiments 2 and 3, the same design was adopted, but 3 parameters of the changes resulting in mispronunciations were more systematically varied: Phoneme type (Consonant or Vowel), position (1st or 2nd syllable of the stimulus) and feature (place and nasality, which are common to French consonants and vowels). Experiment 2 involved modifications affecting consonants, and Experiment 3 involved changes performed on vowels. So far, 44 18-month-olds and 32 12-month-olds participated in both experiments. Data are currently being processed.

P3-41

Prosodic structure and the emergence of coda segments in EP: A case study

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This study investigates the relation between prosodic structure and the emergence of segments in the speech of one European Portuguese (EP) child (aged between 1;0 and 3;6). Specifically, the role of prosodic phrasing and prominence on the emergence of target coda segments is examined. This study has 3 goals: (1) to test the hypothesis (based on literature showing that prosodic properties are the first to be acquired - e.g. Gerken 1996, Morgan & Demuth 1996, Christophe et al 2003, Peperkamp 2003), that prosodic phrasing may play an active role on the emergence of segments; (2) to review previous results on coda acquisition in EP (Freitas 1997, Correia 2004) in the new light of the emergence of segments and prosodic phrasing effects; and (3) to add to the debate around the syllabic status of coda segments in EP (e.g. Barbosa 1966, Mateus & Andrade 2000, Vigário 2003).

The corpus under analysis consists of a linguistic diary database of spontaneous production data, complemented by a database of audio recordings ranging the same period of time (*LumaLiDa*, Laboratório de Fonética, FLUL). For each child utterance, prosodic phrasing is annotated on the basis of the description of prosodic structure in EP (Frota 2000, Vigário 2003). The crucial domains for our analysis are the prosodic word (PW), the phonological phrase (PhP) and the intonational phrase (IntPh). All occurrences of coda segments in the target are marked and their actual production by the child analysed. The position of the segment as final or internal to PW, PhP and IntPh is considered, as well as its position relative to PW and phrasal stress. The occurrence of the same segments as onsets is also marked in the data. Frequency effects are inspected by looking at the segment/segment sequences frequency in the input and by distinguishing repeated old words and emerging new words in child speech.

Preliminary results based on the analysis of 1000 target codas (between 1;5 and 2;6) show that 72.5% of codas are not yet produced; 65% of these are in PW-internal position. A wide variety of strategies are used by the child to fill the target coda. The use of resolution strategies is more frequent in PW-final and PhP-final than in PW-internal and IntPh-final positions. The strategies not only vary according to segment type, but also by position in the prosodic structure. The data also suggests that syllabic status may not be a key factor in the emergence of segments (cf. Bonilha et al. 2007, for Brazilian Portuguese): while it seems true that codas with trill are the last to emerge (as previously reported), it is also true that the trill does not appear in onset either, in the period analysed.
Our preliminary results thus strongly suggest that (1) prosodic phrasing plays an active role in the emergence of segments, and (2) that syllable position may not always play a key role. Further analysis will tell us whether these conclusions hold, and will also clarify the roles of prosodic prominence and of frequency effects.

P3-42

The acquisition of Catalan vowel contrasts by bilingual children in two districts in Barcelona

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Bilingual children in Barcelona have been shown to perceive vowel contrasts present in Catalan differently depending on their dominant language (Bosch & Sebastián-Gallés, 2003). The discrimination between these vowel contrasts present in Catalan but not in Spanish might also manifest itself in production. Therefore, at the age when they begin attending school, children might show these differences in production depending on language dominance at their home. The language dominant at home could be either the same that is dominant in the district or not. This paper intends to elucidate the role of language dominance at home and at the district. In order to do this, the production of the vowel contrasts /ɛ/ vs. /e/, /ɔ/ vs. /o/ and [ə] vs. /a/ by children is examined.

The subjects in the present study are between 3 and 5 years of age. Children of this age have already acquired the phonological and prosodic features of the languages they are exposed to. The children under study live and attend the pre-school section at a school in the district of either Gràcia or Nou Barris. Gràcia is a traditionally Catalan district in the core or the city, whereas Nou Barris is a district at the outskirts of Barcelona with a strong presence of Spanish. Efforts have been made to keep the numbers of Spanish-dominant and Catalan-dominant bilinguals in both districts balanced.

Methodologically, a combination of auditory and acoustic analysis was used to analyze the productions of the vowel contrasts. Transcriptions by two transcribers allow us to discern whether Catalan speakers perceive the vowels as target-like or not. Only the clear cases of target vowels are then acoustically analyzed.

The results suggest that the language dominant at home plays a less important role than the language dominant in the district where children live. No matter what the language dominant at home is, the production by children shows a strong effect of the language in the district. F1 seems to play a more important role than F2 in conveying these specific vowel contrasts. Significant differences in F1 values between the vowel pairs are more often found in Gràcia than in Nou Barris. This means that the vowels in each pair are more similar in terms of vowel height in Nou Barris than in Gràcia. Although the vowels acoustically analyzed in this study are perceived as target-like, the vowels in each pair are produced with more dissimilar F1 values in the Catalan-dominant than in the Spanish-dominant district. For example, the F1 value for /ɛ/ and that for /e/ are significantly different in Gràcia but not in Nou Barris. These results thus

seem to favour the language dominant in the district over the language dominant in the individual's household as the most reliable factor for predicting preservation or change of phonological features.

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P3-43

The use of cues to word stress by Dutch and Brazilian Portuguese 3 year olds

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Whereas younger children often delete unstressed syllables, 3-year-olds usually produce trochaic and iambic disyllabic words with correct word stress and number of syllables. However, it has recently been shown that 3-year-old Dutch children are insensitive to stress errors in iambic words, whereas they do notice stress errors in trochaic words. Using a visual fixation task de Bree et al. (2007) showed, that these children looked significantly longer to trochaic words if stress is produced correctly than when it is mispronounced, while the looking time to iambic targets with correct and mispronounced stress did not significantly differ. This seems to suggest that Dutch children expect words to start with initial stress. Hearing a trochaic target with stress on the final syllable slows down word recognition. However, hearing an iambic target produced with initial stress has no detrimental effect on word recognition.

In this paper we further investigate the nature of the 3-year-olds knowledge of word prosody by presenting 16 3-year-old Dutch children with a special version of a gating task. Children were randomly presented different gates of two words that share the segmental make up of the first syllable plus the onset of the second syllable, but differ in word stress. Examples of target words are *koning* /'konIŋ/ 'king' and *konijn* /ko'n□in/ 'rabbit'. Upon hearing part of a word, children had to match the auditory fragment with one of two pictures presented on a screen, representing the two phonologically similar words. There were four word pairs and three gates for each word, which occurred twice in randomized order, resulting in 48 test items. The test was preceded by six test trials to ensure children properly understood the task. The results for Dutch confirmed the findings of de Bree et al. (2007): children overwhelmingly chose the picture corresponding to the trochaic target, whether the syllable they heard came from the trochaic or the iambic target. There was a significant effect of word type, but no interaction with the stress cues in the auditory fragment.

Although stressed and unstressed syllables clearly differ in length, amplitude and pitch in Dutch, these cues are not used upon hearing a syllable in isolation. As word stress is a relational property, one might argue that children are not able to interpret these cues in isolated syllables, and instead adopt a default strategy: 'assume that words start with stressed syllables'. For a language like Dutch, in which 90% of the input words are trochaic, this is a useful strategy. However, Brazilian Portuguese is a language without a strong bias for either iambic or trochaic words (Santos 2005). We therefore designed a similar gating procedure using Brazilian words and tested 16 Brazilian 3-year-olds on the same task. Unlike the Dutch children, the Brazilian children did not show a significant preference for either foot type. This finding is in line with evidence from child language production data, which also show early mastery of both iambic and trochaic words, and argues against a universal preference for trochaic words.

P3-44

How do pre-reader and reader children process schwa deletion?

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Hearing a reduced variant of a word seems to delay access to the representation of this word. Racine and Grosjean (2000) examined the consequences of schwa deletion on word recognition in French. In both a shadowing and a lexical decision task, they observed a processing cost for reduced forms of words (e.g, [lapluz] 'the lawn') compared to the non-reduced form ([lapəluz] 'the lawn'). Their results were accounted for in terms of a conflict between the underlying orthographic form and the surfaced phonetic form. The goal of this study is to test this orthographic account of the processing cost due to schwa deletion. Hence, in four experiments, we compared performance of pre-reader children to those of older children who know how to read. In experiment 1 (lexical decision task) and 2 (picture-word correspondence checking task), target words were presented either in their reduced forms (e.g, [ləʃval], 'the horse') or in their non-reduced forms ([ləʃəval], 'the horse'). With both tasks, results revealed that for both pre-reader (48 participants, aged from 5;10 to 7;8, all native speakers of French from the Neuchâtel area, Switzerland) and reader children (48 participants, aged from 9;1 to 11;0), non reduced versions of target words were recognized faster than their reduced versions. Experiment 3 (word monitoring task) was carried out with a different set of participants (21 pre-readers - from 5;0 to 6;0 - and 21 readers - from 7;5 to 6;4 -, all native speakers of French from the Grenoble area, France). Children were asked to detect target words in auditorily presented sentences. As in experiments 1 and 2, reduced versions of targets exhibited longer response times than their non reduced versions. Hence, in three experiments, we found that both pre-reader and reader children showed a processing cost for reduced versions of words compared to non reduced versions of words, despite that pre-readers do not know how to write these words. Although a conflict between the underlying orthographic form and the surfaced phonetic form of target words could account for the effect obtained for readers (as it could account for the adults results), it could not explain the processing cost found for pre-reader children. We hypothesized that the effect found for pre-reader children is due to the prevalence of the non reduced version of words in the spoken input of children. Because in the targets of experiments 1, 2 and 3, schwa deletion is not obligatory (e.g, 'cheval' can be produced either [ʃval] or [ʃəval]), the effect found for pre-readers could be due to a higher frequency of the non reduced versions in the children's linguistic input. Experiment 4 was designed to disentangle the role of orthography from that of the frequency of the reduced/ non reduced versions in the children's linguistic input. In a word monitoring task, we used target words in which schwa deletion is compulsory (e.g., *bracelet* [braslɛ]). Data are currently being collected for this experiment.

P3-45

Phonological awareness and phonological units: A closer look at the prosodic development of child Japanese

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Phonological awareness has been claimed to play an important role in the development of reading skills, and there is the need to assess a child's phonological skills accurately. The syllable and the phoneme are the phonological units that have been discussed the

most in terms of phonological awareness, but recent studies have claimed that other phonological units may also play an important role in predicting a child's reading ability (Schwanflugel et al. 2004). Although the mora has attracted much attention in the discussion of phonological awareness of Japanese, very few, if any, studies have discussed phonological awareness in terms of other prosodic units such as the foot or word shape.

The present study focuses on the development of prosodic structures of child Japanese. In particular, we will take up the phonological foot and its relationship to word shape.

In Japanese developmental phonology, the mora has widely been accepted as the most important phonological unit. However, it is also a well-known fact that the bimoraic foot plays an important role in developmental data. For example, lengthening of monomoraic lexical items (e.g. me > mee "eye", te > tee "hand") can be interpreted as a bimoraic minimality effect, while segmental deletion (e.g. maitta > matta "give up") is presented as evidence for the disyllabic maximality effect (Kubozono 2003, Ota 2003).

Although bimoracity is crucial in child Japanese, a close observation of the acquisition data reveals that bimoracity alone will not suffice to account for the prosodic development of Japanese. To illustrate, when the deviant forms of spontaneous child Japanese from our data were investigated, examples where the bimoraic structure was avoided could be observed quite often (e.g. baka > kaata "stupid", iya > yaaya "don't want to"). Since the target words all conform to the bimoraic foot, there is really no particular reason why children should avoid these forms and convert them to the Heavy+Light syllable combinations if the principle of Foot binarity alone were involved. Moreover, our survey of dialectal differences of monomoraic words in child Japanese also showed that more than 40% of the forms are Heavy+Light (e.g. ka "mosquito": "kan.me"(Tochigi dialect), "kan.su" (Aichi dialect), "kam.pa" (Shizuoka dialect)), while only 15% are Light+Light (e.g. ka "mosquito": "ka.me"(Tochigi dialect), "gago" (Hiroshima dialect)). This result goes counter to the predictions based on bimoracity. These examples clearly indicate that an attempt to account for child language solely in terms of bimoracity will not do. Although the Heavy + Light form has been claimed to be important in stress languages such as English and Dutch, our findings imply that even in a non-stress language like Japanese, this form seems to be preferred in child language. This implies that the Heavy+Light combination may not necessarily be linked directly to stress languages alone, and that there is the need to take into consideration the word shape in terms of syllable combinations even in a syllable-timed language such as Japanese.

In order to further investigate the relationship between the developmental pattern of bimoraic foot and Heavy+Light word shape, we conducted an experiment on reversal tasks (e.g.ta.ma.go "egg"> go.ma.ta). 40 first grade elementary students and 40 sixth grade students participated in the experiment. The error patterns for the two groups reveal that the Heavy+Light form (e.g. ku.tsu.shi.ta "socks" > ta.shi.ku.tsu (should be reversed as ta.shi.tsu.ku)) is prevalent in the first grade group, but not for the sixth graders. Similar results were obtained for tasks involving both non-words and existing words. We interpret the preference of bimoracity at the left word edge to imply the dominance of the Heavy+Light form at the earlier developmental stages of Japanese, and suggest that not only the mora and phoneme levels but also the binary foot as well as word shape may play an important role in better assessing phonological awareness of this language.

P3-46

How long is a vowel? A first look at the vowel system of four year old Samoan speaking children

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In research on phonological acquisition much of the discussion of segmental inventories is centred on the development of consonants. This is not surprising as children's consonantal production becomes accurate only over time and error patterns decrease with age. By contrast the research into the development of vowels is scanty. What little research has been done seems to support the view that children master vowels much earlier than consonants and do not produce errors in their production. In Spanish a language with a small vowel inventory (5) 2 year olds produce vowels with an accuracy of around 93% reaching 98% for 3 and 4 year olds (Goldstein 2007). Even in a language with a larger inventory of vowels such as English (26) vowels are produced without errors by the age of 3 (Templin 1957) and children are over 90 % accurate with their vowel production by the time they enter their fourth year (Dodd, Holm et al. 2003 97.39% for British English). Our poster reports on initial findings from research into the acquisition of vowels by four year old Samoan speaking children growing up in New Zealand. Samoan is a Polynesian language with ten vowels: five short and five corresponding long /i u e o a iː uː eː oː aː/. In contrast with previous research our results indicate that children in their fifth year produce errors in their production of vowels and their vowel development is not complete. While the children in our study have acquired the qualitative features of the vowels in their inventory and produce vowels with almost 100% accuracy they have not acquired the quantitative features of vowels. No more than three children from a pilot group of 20 produced the appropriate length in the lexical items with long vowels e.g. /muːmuː/ 'red'. Further, none of these three children produced length consistently as the quantity of their long vowels differed from the adult target more than 50% of the time. Our research thus indicates that vowel development can take longer than has been previously assumed and quantitative distinctions in particular are not fully mastered before age five. To conclude our poster we discuss various factors that may affect children's acquisition of the long vowels in Samoan. These factors include the bilingual context in which these children are growing up, the frequency of minimal pairs in the ambient language and the prosodic features of Samoan itself.

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P3-47

Consonant inventories of Finnish-speaking children at age two

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Phonological acquisition will be better understood once there are data on the acquisition of a broad range of typologically distinct languages. Finnish, a member of the Finno-Ugric language family, with a phonology different from those of the languages of the Indo-European family often reported, has not yet been well documented. Hence, no normative data exist on the acquisition of consonants among Finnish-speaking children.

The aim of this study was to profile the consonant inventories, in three word positions, in the speech of 24 children acquiring Finnish at age 2. Furthermore, the relationship between consonant inventory and later language development was examined. Spontaneous speech samples were transcribed using the IPA and the meaningful words produced by the children were identified

following a procedure devised by Vihman and McCune (1994), with criteria based on both formal (phonetic) and functional (or pragmatic-semantic) considerations. Phonetic transcriptions were analysed to determine the inventories of initial, medial and final consonants produced by the child, regardless of whether or not they match the adult model. Later language skills were evaluated using the Reynell developmental language scales III at age 2;6.

The findings revealed considerable individual variation in the sizes of both lexicon and consonant inventories. The children produced an average of 47 words (range 5-121). The results indicated a positive correlation between lexicon and consonant inventory. There were six consonants used by 50% of the children in word initial position, eight in word medial position and two in word final position. The data confirm the universal trend that stops (/p, t, k/) and nasals (/m, n/) are acquired early. Although /d/ is universally acquired early, Finnish children acquire it late due to its marginal role in the Finnish consonant system. In addition, articulation of Finnish apico-alveolar trill (/r/) requires relatively complicated motor performance and this seems to have an effect on its late acquisition. Late acquisition of these two consonants seems to be a language specific feature in the acquisition of Finnish. A weak to moderate correlation appears to exist between lexicon size/consonant inventory size at age 2 and linguistic development at age 2;6.

Keywords: phonology, consonant inventory, lexicon, variation

P3-48

Rhythmic and durational measures of speech in English-speaking school-age children

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Purpose: The purpose of this study was to examine rhythmic and durational differences between children's and adults' speech in American English. It was hypothesized that the rhythmic aspects of language develop slowly over time, and the results would indicate differences in speech rhythm between adults and children.

Method: The participants were 32 native monolingual speakers of American English (16 children and 16 adults), who were living in Alabama at the time of recording. Recordings were taken twice separated by one year as a part of a larger longitudinal study. The children's ages ranged from 7;0 to 13;11 (mean 10;6). The adults were the parents of the children and their mean age was 40;3 (range 33;11 – 49;11). There were nearly equal numbers of female and male participants in each group.

Each participant produced 10 short phrases and sentences after pre-recorded models. This method was used to elicit the same utterances from all participants without using written materials. The following seven phrases were examined in this study: (1) In the United States, (2) Ten o'clock, (3) He went to work, (4) A glass of water, (5) She ate a sandwich, (6) I read a good book and (7) She is eight years old. The recordings were digitized at 22.05 kHz and 16 bit amplitude resolution. A total of 448 utterances (7 sentences x 32 speakers x 2 times) were analyzed.

Acoustic analyses of the above speech samples were conducted using spectrograms and waveforms. Durations of vowels, vocalic intervals (consonants or consonant clusters) and utterances were measured in milliseconds. Based on these measurements, the following rhythm values (among others) were calculated for each speaker:

%V Sum of vocalic interval duration divided by the total duration of vocalic and consonant intervals (Ramus et al., 1999)
nPVI-V Normalised Pairwise Variability Index for vocalic intervals (Low et al., 2000)
rPVI-C Raw Pairwise Variability Index for consonant intervals (Low et al., 2000)

In addition to the above rhythm measures, durations of utterances, two voiceless fricatives ('*s'* and '*sh*') and four vowel segments were also measured. All of these values are currently being analyzed.

Preliminary results: Preliminary results of this study indicate that the differences in rhythmic measures (%V, nPVI-V, rPVI-C) are not statistically significant between children and adults and between two times of testing. However, there may be some differences between adults and children in durations of some vowels, consonants and overall utterances. There may also be differences between younger children and older children. It appears that the children's segments and utterances may be longer than the adults', perhaps due to slower speaking rate, but there may not be measurable rhythmic differences between school-age children and adults.

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P4-1

Cognitive, linguistic and genetic (FOXP2) profiles in a three-generation Spanish LI family

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Objective: The present study is centred in the analysis of language and cognitive abilities of a family who exhibit a severe Language impairment (LI), with an inheritability autosomic-dominant pattern, similar to the well known KE family in UK; and in the latter comparison of both families.

Participants and Methods: The G family is composed by three generations (three main members will be analyzed in the present study: grandmother, mother and grandson). Their intelligence data are obtained according to their IQ (WISC-R, WAIS III), Language's analysis has two main sources: (1) the TB-R aphasia profile (2005), and (2) analysis of linguistic errors (phonologic, lexical and morpho-syntactic) based on the LARSP (1989). Other abilities evaluated are: auditory discrimination (non-verbal and verbal), short-term phonological memory, and apraxia of speech. The genetic study is a conventional and molecular cariotype, and the cribbage of the FOXP2 gene, with analysis of the mutations of this last gene and of the variant R55H and R328X.

Results: The results, evidence important motor difficulties as well as the LI. Significant similarities with the pathological pattern of the KE family's difficulty that could be developmentally linked to the LI. The deficit is generalized to all the aspects of language competence, but mainly in speech and syntax and not in morphology. This result is consistent with the peculiarities of the English and Spanish crosslingusitic findings in SLI. In addition, significant working-memory problems and reduced IQ in both the verbal and the non-verbal domains were founded. The genetic study is still under process of analysis.

Conclusions:The former linguistic and cognitive data, suggest that LI is a complex developmental disability, and according to our findings, we expect that the link between LI (including its underlying cognitive basis) and genetics is much more weak than the one that is been suggested up to now. The data will be discussed in relation to the causal models of the genetics and cognition related to language acquisition.

P4-2

Using eye movements to determine the interaction between visual information and the narrative comprehension and narrative retell in children with SLI

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The study presented in this paper examines the gaze patterns of children with SLI in the comprehension and production of narratives. First, we analyse the eye movements of the subjects over scenes depicting a story while they listen to the corresponding narration (language comprehension). We then analyse eye movements over a scene during narrative retell (language production). Finally, we compare the gaze patterns observed during the comprehension and production tasks (looking to aid comprehension and looking to aid narrative production).

The study sample consisted of 12 bilingual Catalan/Spanish-speaking children of pre-school age (around five years old) with normal language development and 12 children with SLI. Experiments were performed using the Iriscom QG 2SH (Quick Glance) eye-tracker equipment and an adaptation of the Eye Science software was used to analyse the results. Two experiments were carried out: in Experiment 1, subjects were shown the Bus Story (Renfrew, 1973) accompanied by the corresponding narration; in Experiment 2, subjects were shown the same visual stimulus without the narration and were asked to provide a narrative retell of the story. The subjects' gaze pattern was analysed in both experiments.

The results indicate that the Age control group made considerably more fixations than the SLI group during the comprehension task (both in the general perception of the scenes and on the semantically relevant areas). As a result, children with SLI made more saccades than the control group during the comprehension tasks. We did not observe any significant differences between the gaze patterns of the two groups during the narrative retell. Finally, comparison of the eye movements of the two groups during both experiments shows that the Age control group made considerably more fixations (on the most relevant areas and the non-relevant areas) during the comprehension task than during the production task, which was not observed in the SLI group. The gaze pattern of the SLI group did not vary between the comprehension and production tasks. Children with SLI exhibited slower processing than the control subjects as they made fewer, longer fixations and had difficulty selecting the relevant visual information, since they made fewer fixations on the semantically relevant areas of the scenes.

We discuss the results in relation to the interaction between visual attention and language processing in children with normal language acquisition and children with language impairment.

P4-3

An ERP study on gender and number agreement of object clitic pronouns in Spanish-English bilinguals with SLI

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Introduction: Spanish-speaking children with Specific Language Impairment (SLI) often omit or fail to mark clitic pronouns for gender or number agreement with their antecedents. In Typical Language Development (TLD), these pronouns first appear at 2;0. We still do not know if these errors are due to limitations in language production or to processing limitations that interfere with their acquisition. The present study compared brain's response to Spanish direct object clitic pronoun sentences in Spanish-English bilingual children with and without SLI by using ERPs.

Method: *Participants*; Seven children with SLI and 7 children with TLD participated. The groups were matched for age (7;11-11;1) and gender (7 females and 7 males). They had normal hearing and performance IQs. All were Spanish-speaking children who lived in Spanish-speaking homes in NYC. Most of them were enrolled in bilingual English-Spanish education programs. Children referred as SLI scored at least 2.0 SDs below on the average SD of all the language-relevant subtests of the Spanish ITPA. Their English skills (CELF-3 Screening test) were also significantly below their expected age level. Their SLI and bilingual status were also confirmed by the judgments of their parents (who filled a questionnaire out) and by teachers.

Procedure: We used a cross-modal picture priming task to examine whether the appropriate antecedent noun and only that noun was activated at the pronoun in Spanish sentences. Each sentence included two nouns differing in gender or number and, later in the sentence, a clitic pronoun referring to the first noun. The two nouns were selected by varying for 8 combinations of gender, number, and order in the sentence. The second noun always differed from the first noun in number, gender, or both.

Each sentence was presented auditorily and randomly three times across 3 blocks: once with a picture corresponding to the first noun, once with a picture corresponding to the second noun, and once with an unrelated picture. The picture was shown on the screen right after the pronoun. The child pressed one of two buttons indicating whether the picture was something alive or not alive. Their level of understanding and attention was also assessed through some random questions about the sentence.

Results and discussion: Data were analyzed in terms of ERP responses, reaction time, and number of correct responses. Bilingual Spanish-English children with TLD showed a strong N400 effect at P3 electrode. They also had significantly different activation at this parietal area for three picture/sentence conditions: a picture matching the pronoun (with the same gender and number that the first noun), a picture corresponding to the second noun (which had different gender/number than the pronoun), and a picture unrelated to the sentence. However, bilingual Spanish-English children with SLI did not show a N400 effect at the P3 electrode or any differential activation at this parietal area for the three picture/sentence conditions. This suggests a lack of sensitivity to gender and number agreement. The results were discussed in terms of their implications for establishing pronoun-antecendent relations and the possible role of working memory.

P4-4

Language production and eye movements in children with SLI

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This study examines whether cognitive/conceptual factors such as knowledge of the semantics and argument structure of verb induce variations in sentence production and whether attention is focused on conceptually prominent elements (elements relative to argument structure). Our initial hypothesis is that the explicit cognitive/conceptual factors of a scene (event structure), or those which are grammaticalized in the linguistic input (verb and argument structure), may determine language production and the focus of attention. This first hypothesis is closely related to a second, in which we formulate a possible correlation between gaze fixation and duration and utterance features. Our third hypothesis refers to the existence of relevant differences according to linguistic competence, so we tested the influence of linguistic knowledge in children with normal language acquisition and children with SLI and partial verb and argument productivity.

The sample in this study comprised 22 bilingual Catalan/Spanish speaking children of pre-school age (around five years old) divided into two groups: eleven children with SLI and eleven Age-control children. We used the QG 2SH (Quick Glance) EyeTech eye-tracker equipment and an adaptation of the Eye Science software to analyse the results. We prepared thirty visual stimuli which consisted of complex static images. The procedure consisted in presenting the subjects with a series of visual scenes in which the participating entities and the relationships between them were manipulated. The subjects were then asked to produce a specific target sentence.

The results show that argument structure is a conceptually prominent factor that governs the subjects' attention and sentence production, since we observed that the most relevant area of the presented scene received the most attention and was described in production by all of the subjects. We also found a correlation between gaze pattern and language production. However, children with SLI showed a different pattern to the control children with typical acquisition, since they gave less accurate descriptions of the scene and made numerous argument omission errors, more elisions and more verb omissions. With respect to eye movements, the results indicate that children with SLI have difficulty selecting the most relevant area of the scene, since they made fewer fixations and these fixations were slower than those of the control children. The gaze pattern and language production of the SLI group indicated limited knowledge of the semantics of verb, difficulty in selecting the relevant information for describing the event, and certain limitations of processing speed.

We discuss the data in relation to the relationship between the 'visual world' and the knowledge and processing of language in children with normal acquisition and children with language impairment.

P4-5

Interaction between the long-term lexicon and working memory in children with and without SLI

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Children with specific language impairment (SLI) show slower vocabulary development than their peers, which problem has been associated with a deficit in phonological working memory (Gathercole, 2006). Evidence from typically developing children indicates that decayed memory traces in phonological short-term memory can be reconstructed using lexical knowledge (Gathercole, Frankish, Pickering, & Peaker, 1999). Children's phonological working memory performance improves if the nonwords include meaningful syllables because of the interaction between the long-term lexicon and working memory (Dollaghan et al., 1995). Further, the active maintenance of information in working memory supports relevant word representations (Munakata, Morton, & Yeris, 2003).

The following hypotheses were tested:

1. Children with SLI have a deficit in simultaneous processing (Marton & Schwartz, 2003) thus, they cannot effectively support their working memory performance with their existing long-term knowledge.

2. Children's working memory difficulties in tasks involving language comprehension are caused by weak word representations.

Two nonword repetition tasks were used to test the interaction between the long-term lexicon and phonological working memory and two listening span tasks were developed to examine the impact of lexical knowledge on functional working memory performance. The first nonword repetition task was a traditional task that we have used in our previous research (Marton & Schwartz, 2003), whereas the stimuli of the second nonword repetition task contained one meaningful mono-syllabic word. All nonwords were 3-4-syllable long. In the second experiment, we used a traditional listening span task (TLS) and a newly developed „Active Listening Span" task (ALS). In this latter task, children were presented first with incomplete sentences, and then their own words –with which they completed the sentences-, were used for testing their listening span. With this method, we ensured that all children were familiar with the words they had to recall, and all words to-be-remembered were previously activated. Three groups of children participated in this study: 15 SLI (7-10 years); 15 age-matched and 15 language-matched controls.

Findings: 1. Phonological working memory tasks: All typically developing children performed better when the nonwords contained a meaningful syllable (a high frequency word) than in nonword repetition with no meaning. These outcomes are in agreement with previous data (Dollaghan et al., 1995). The children with SLI did not show a difference in performance accuracy across the nonword lists. The children with TLD did benefit from their permanent knowledge, whereas the children with SLI could not take advantage of their long-term knowledge.

2. Functional working memory tasks: Both groups of typically developing children performed significantly better in the ALS task than in the TLS task. In contrast, the children with SLI showed no difference in recall accuracy across tasks. These children did not benefit from their long-term knowledge or from the previous activation of the stimuli. These findings reveal problems in the interaction between working memory and the long-term lexicon in children with SLI. Theoretical and clinical implications of these findings will be discussed in the poster presentation.

P4-6

A comparison of working memory and attention profiles in children with Specific Language Impairment with and without Attention Deficit / Hyperactivity Disorder

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We will report a study of working memory and attention with three clinical groups aged 6-9 years. It is well established that there is a relationship between language development and working memory function in children and this is found in typical and atypical language groups. However, there has been limited research into the relationship between language, working memory and attention in attention deficit disorder / hyperactivity disorder. The impetus for this line of research stems from the observation that just as language and working memory impairments are commonly observed, so are co-morbid language and attention deficits. To date, however, no known study has completed a detailed investigation which has included the four components of the Baddeley Working Memory model (Baddeley, 2000) and the major components of attention in clinical samples of children with specific language impairment (SLI), attention deficit (ADHD) and children with co-morbid SLI and ADHD. The study to be reported focuses on the performance of children from these three clinical groups on measures of language, working memory and attention. The aim of the study is to identify working memory profiles for the three groups and identify any underlying similarities. Samples of 20 children from each of the groups described plus a comparison group are currently being assessed. The materials include the Working Memory Test Battery for Children (Pickering & Gathercole, 2001) and supplementary tasks in order to test the Phonological Loop, Visuo-spatial Sketchpad, Central Executive and Episodic Buffer components of working memory. Measures included to test the major aspects of attention (i.e., sustained, selective, dual-task and switching) are from the Test of Everyday Attention for Children (Manly, Robertson, Anderson & Nimmo-Smith, 1998). The results so far show significant differences between the SLI and the comparison groups on measures of the phonological loop, episodic buffer and central executive tasks supporting previous research findings. In addition, the SLI group showed significant problems with

sustained attention and attentional switching. The results from the ADHD and mixed ADHD/SLI groups will also be reported, and the findings discussed in relation to the nature of the working memory profiles of the clinical groups.

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P4-7

Updating working memory with auditory and visual information in children with SLI

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Children with specific language impairment (SLI) have well-documented deficits in working memory (WM). These deficits include impairments in phonological memory capacity, in scanning short-term memory for verbal information, in verbal memory span, and in retaining sequential information (e.g., Gathercole et al., 1990; Marton et al., 2003). Studies of WM in SLI have mostly been limited to examination of either the auditory or visual modality using non-word repetition or suffix effects in sentence memory tasks. Furthermore, most research on WM in SLI has not considered executive functions (e.g., inhibiting irrelevant information) in this population, in spite of the common neural circuitry underlying memory and the executive control system (Casey et al., 2000). Both memory and executive functions are central to language processing and may thus contribute to the cognitive deficits in SLI.

The current study was conducted to investigate auditory and visual WM in typically developing (TD) children and in children with SLI. The participants included 8 TD (3 girls, mean age 9.4, SD = 1.2) and 8 SLI (3 girls, mean age 9.4, SD = 1.1) children. The children with SLI had no known neurological problems, no hearing impairment, normal performance IQs, and scores below 1.25 SD on at least two subtests of the Clinical Evaluation of Language Fundamentals-Fourth Edition (CELF-4).

An *n-back* task was used to assess the ability to update WM with auditory and visual information. Participants were instructed to monitor series of fruits and vegetables presented either visually or auditorily via a computer. The task required them to press a button when a stimulus was the same as the one presented "n" trials earlier ("back") in the sequence. Both the visual and auditory tasks were presented under four conditions of memory load: 0-, 1-, 2-, and 3-back. The order of the auditory versus visual experiments was nearly balanced among the participants.

Accuracy was computed by calculating the total number of responses to targets for each participant. Analyses revealed a main effect of load and a significant interaction between modality, load, and group. The TD group performed significantly better on the 2- and 3-back conditions in the visual relative to the auditory modality, whereas the SLI group did not show a modality advantage under any conditions. Preliminary analysis of reaction times indicates that the time course for updating the contents of WM, or ability to inhibit irrelevant information, differs between the TD and SLI children. (An additional ten participants have been tested and their data is currently under analysis.)

Findings of this study elucidate the nature of WM and executive functioning in children with SLI and in children with typical language development. The clinical ramifications for evidence of impaired WM and executive functioning in children with SLI will be discussed.

P4-8

Object clitics, definite articles, and verbal morphology in Specific Language Impairment (SLI) in Greek: Clinical markers and a comparison of linguistic accounts

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Aims / Background: This study aimed to identify potential morphosyntactic markers of SLI in Greek, and to provide evidence for/against certain grammatical accounts of SLI. The focus is on structures proposed to be difficult for children with SLI in Greek: *pre-verbal object clitic pronouns and definite articles* (Tsimpli & Stavrakaki 1999), *past tense* (Stamouli 2000) and *Subject-Verb (S-V) agreement* (Clahsen & Dalalakis 1999).

Grammatical accounts of SLI make different predictions regarding the degree of impairment on these structures. The '*Interpretability Hypothesis'* (IH) (Tsimpli & Stavrakaki 1999) predicts high omissions of both object clitics and definite articles in SLI, and fewer but existent difficulties with past tense, on the basis of their non-interpretable formal features. The '*Agreement-Deficit Hypothesis*' (ADH) (Clahsen & Dalalakis 1999) predicts difficulties with S-V agreement but not past tense, caused by a deficit in the optional agreement features of verbs. Finally, the '*Unique Checking Constraint'* Hypothesis (UCC) (Wexler 1998; Tsakali & Wexler 2003) predicts no difficulties with past tense or S-V agreement and no omissions of clitics for typically-developing Greek children and similarly, for children with SLI.

Method: Nine Greek pre-school children with SLI (mean age: 6 years) were compared with a group of chronological age-matched (CA) and a group of language-matched (LA) typically-developing children on picture-based elicitation tasks assessing the production of the above structures.

Results: The SLI group scored significantly lower than both control groups on object clitics but were less impaired on definite articles, past tense and S-V agreement, on which they differed significantly from only the CA group. Moreover, past tense was significantly more impaired than S-V agreement. Finally, errors in object clitics were substitutions and omissions. Omissions of clitics were not high (<30%) but distinguished the SLI from the control groups.

Discussion: Confirming previous findings by Tsimpli & Stavrakaki (1999), production of object clitics was identified as an area of particular difficulty for Greek children with SLI. This was indicated by the SLI group's lower performance on these even when compared to children of a similar linguistic level (LA control group). However, the extent of difficulty was not as high as expected, as structures were used more often than in the previous studies and were not omitted as frequently. With regards to the theoretical accounts, no one account was completely upheld; the ADH was not supported, as S-V agreement was not as impaired as expected, while past tense was. The UCC was confirmed for the typically-developing groups, which did not omit object clitics, but not for the SLI group, where omissions of clitics and difficulties with past tense marking were noted. The IH predicted the difficulties with object clitics, definite articles and past tense but not the dissociation between object clitics and definite articles. This finding might be explained through accounts highlighting the categorical/syntactic differences between object clitics and definite articles in Romance languages, such as the Computational Complexity Hypothesis by Jakubowicz & Nash (in press).

P4-9

The relation between non-word repetition and non-word reading in Dutch children with Specific Language Impairment

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Recent research has shown that children with SLI have severe problems with non-word repetition tasks that are commonly assumed to tap phonological processing skills. The consistency and magnitude of this deficit has led to its adoption as a behavioural marker of SLI (Gathercole, 2006). In addition to oral language difficulties, children with SLI often also show reading problems (McArthur et al., 2000). As these reading problems are argued to stem from phonological processing deficits (Mody, 2003), the question arises whether a deficit in non-word repetition is restricted to those children with SLI that also display reading problems, or whether phonological processing deficits are central to SLI regardless of the presence of reading problems.

To address this question, non-word repetition, non-word reading and syntactic proficiency was assessed in 22 Dutch children with SLI. A strong correlation was found between non-word repetition and non-word reading. However, no relation between non-word repetition and syntactic proficiency was observed. In addition, the children with SLI that displayed poor performance on the non-word reading task (n=16) performed significantly more poorly on the non-word repetition task than the children without reading problems (n=6). Our results indicate that a deficit in phonological processing is closely linked to reading problems but not to syntactic behaviour. Our observations are consistent with those of Bishop (2006) and Catts et al. (2005) who argue that the oral language difficulties of SLI children without reading problems cannot solely be explained by a deficit in phonological processing. They suggest that 'other cognitive deficits' must be underlying the oral language difficulties displayed by SLI children (see also Bishop & Snowling, 2004).

We will explore some potential cognitive deficits in the same group of children with SLI, focusing on central executive functions such as attention, inhibition and working memory (Im-Bolter et al., 2006). We expect that deficits in these executive functions may contribute to the oral language difficulties, but not to the reading problems of SLI children.

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P4-10

Verb morphology in Finnish-speaking children with SLI

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Children with specific language impairment (SLI) often exhibit difficulties in the use of grammatical morphemes that mark tense and agreement. Tense and agreement have been studied earlier in languages whose morphemes express tense alone or tense and agreement together in the same morpheme. In Finnish, tense and agreement are co-occurring but in separate morphemes and in a sequential arrangement.

In the present study, which is part of a larger crosslinguistic investigation of specific language impairment, we will present some preliminary data by 10 children with SLI who are acquiring Finnish. We aim to determine if these children have difficulty with tense and/or agreement. The performance of children with SLI will be compared to that of two groups of typically developing children: those matched for chronological age (TD-A), and those matched for mean length of utterance (TD-MLU).

We employed production probes for first and third person singular and plural inflections in both present tense and past tense. There were 12 items for each of the verb inflection types. The production probes consisted of structured elicitation tasks in which children were asked to complete sentences and describe events. The children with SLI performed more poorly than their typically developing agemates. Preliminary analysis of the children's errors revealed that singular inflections were more accurate than plural inflections, with the former often replacing the latter. In addition, third person inflections were more accurate than first person inflections, with third person inflections often replacing those for first person. Importantly, these errors in agreement might occur even when tense marking (e.g., past tense) was accurate. These results suggest that tense and agreement difficulties are separable in children with SLI in a language such as Finnish. The theoretical implications of this finding will be discussed.

P4-11

Tell me more, tell the baby: The impact of listener adaptation on story grammar performance in children with and without SLI

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Narratives have two levels: macrostructure (story grammar) and microstructure (syntactic properties). Literature provides diverging evidence on the possible trade-offs between these two levels in children with SLI. The objective of this study is to investigate the relationship between the two levels of narrative structure by examining the impact of an increase of the syntactic demand at the microstructural level on the story grammar performance of nine years-old French-speaking children with SLI in comparison to their age- and language- matched peers.

Variation in the syntactic demand at the microstructure level was created by asking children with SLI (N=10), their age-matched peers (N=12) and their language-matched peers (N=12) to tell a story from the Edmonton Narrative Norms Instrument (ENNI) in high and low syntactic demand conditions. The low syntactic demand condition consisted of asking children to tell the story to a baby doll whereas the high syntactic demand was created by asking children to tell the same story to an adult listener. Narratives were

transcribed in CLAN. Their syntactic complexity was measured in mean length of T-Units in words (MLT-W) and their story grammar was scored using the ENNI scoring procedure.

The results showed that in the adult listener condition, the story grammar of children with SLI significantly differed from their age-matched peers' (ρ=0.036).However both, children with SLI (ρ= 0.01) and their age-matched peers (ρ= 0.036) used shorter T-Units when telling the story to a baby. The simplification of syntax co-occurred with a significant improvement in story grammar for the SLI group (ρ=0.047) but not for the age-matched group. This meant that, the story grammar performances of children with and without SLI were similar in the simplified syntactic condition (ρ=0.240).

The results from this study indicate that, notwithstanding language deficit, speech adaptation to the listener in story telling appears at about age nine. Story grammar of children with SLI appears to benefit from the simplification of syntax indicating that trade-offs occur between the two levels of narrative for this group. The implications of these results for explanatory theories of SLI will be discussed.

P4-12

Language specificity of SLI in Turkish-German successive bilinguals: Evidence from case morphology

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SLI is a genuine language disorder affecting the acquisition of language, especially grammar, whereas other cognitive domains remain unaffected (Leonard 1998). The grammatical deficits caused by SLI predominantly refer to tense and/or agreement (morphology), but case and/or case morphology have also often been discussed as to be vulnerable in SLI.

SLI is language specific. The notion of language specificity is ambiguous. Either, it may refer to the fact that the disorder affects only language or to the observation that SLI affects different grammatical aspects in different languages. This ambiguity is of special interest if the outcome of SLI in two languages is investigated intraindividually. Thus, the study of SLI in bilinguals offers not only the opportunity of controlled and constant factors but also the possibility to investigate the language specificity for selected grammatical domains, e.g. morphology in both the children's languages. This is even more motivating, if we focus on typologically different languages, as German and Turkish.

Considering the acquisition of case marking by SLI children, the findings as to whether case marking is affected by German SLI children are still under discussion (see e.g. Clahsen et al. 2006). For Turkish, SLI has not been studied so far.

Our study is based on spontaneous and elicited data from six successive-bilingual Turkish-German children (sL) with and without SLI, investigation the acquisition of case morphology.

The data reveal that the acquisition of Turkish case morphology is affected by SLI. While unimpaired successive-bilingual children master the inflectional system at the age of approx. 3 years, SLI children still produce deviations from the target system at the age of 5 to 6 (Babur et al. 2007). Considering the German data, our findings lead to the impression that, after 24 months of exposure to German, unimpaired sL-children (age of onset 3) acquire the German case marking system comparable to monolingual children. The sL-children produce case markings and use overgeneralizations known from German monolinguals (e.g. they use NOMinative case markings in ACCusative contexts or ACC in DATive contexts). If the children are forced into DAT contexts that require case markings (by the elicitation tasks), the unimpaired successive bilinguals refer to a compensation strategy, overusing prepositional phrases. This compensation strategy has not been found in monolingual German children. The data of the successive bilingual SLI children, however, at least give evidence for a vast delay in the acquisition of case morphology. In spontaneous speech data, they very rarely produce contexts that require case marking at all. A clear quantitative difference to the sL-children can be found. In the elicitation tasks, the SLI children are more likely to produce no-response answers or article omissions than the unimpaired children. If the compensation strategy is used, the SLI children use semantically incorrect German prepositions.

First, our findings strengthen the hypothesis that SLI develops in all languages within the individual and second, that it finds its expression in similar grammatical domains.

P4-13

Determiner and adjective concord in French speaking children with Specific Language Impairment

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This study presents data on French children with Specific Language Impairment (SLI) using an elicitation task for complex noun-phrases (DP) containing variable adjectives. Concord (gender agreement, or ϕ-feature checking) errors within the DP have already been observed in Swedish- and Spanish–speaking children with SLI (Bedore & Leonard, 2001; Leonard, et al, 2001). In French, concord obtains between the noun and the adjective or determiner in the DP. We thus expected to observe difficulties producing these structures in French children with SLI. However, since French has idiosyncratic feminine forms for variable adjectives, children with SLI might have little difficulties producing appropriate forms in this language, as feminine adjective production could be lexically based. If ϕ-feature checking is disrupted in children with a language disorder, they should perform badly in this type of task.

Participants: Six children (aged 5;0 to 6;8, mean 5;8) with SLI participated in the task. Age-, MLU-, Leiter memory-IQ- and receptive vocabulary-matched peers also participated. All children were from predominantly French families from Montreal and Sherbrooke (Canada), and all had normal developmental and cognitive profiles: none had hearing threshold above normal levels.

Method: Four puzzles evaluating i. colour vocabulary, ii. size adjective DPs, iii. colour adjective DPs and, iv. size + colour adjective DPs were used to induce complex DP and feminine variable adjective production. Participants were asked to name the puzzle-pieces they wanted to put on the puzzle board. The puzzles were presented in order of difficulty from less to more complex. Target responses were scored and non-target responses were entered into a database.

Results: Children with SLI did not show difficulties producing colour names (task i) and size DPs (task ii), however, their production of colour DPs and colour + size DPs (tasks ii and iii) was generally more difficult than for control children. Children with SLI tended to produce masculine rather than feminine colour adjectives in feminine DPs (*la gros maison brun* 'the.f big..m house.f brown.fm). A number of children also overused the masculine forms of determiners (ex. *le grande maison* 'the.m big.f house.f'). One child systematically used the feminine form for all 'green' items, a pattern never observed in controls.

Discussion: Results are consistent with those already found for Swedish and Spanish. In addition, our study goes further than previous studies, as it verifies lexical-semantic knowledge of adjectives, in addition to the ability to produce complex DP agreement, in these children. Differences between French and cited languages lead us to believe that the difficulties encountered by these children must include a feature-checking deficit, as children with SLI produce structures with inappropriate adjectives (masculine for feminine or vice-versa) even when the choice of these forms is lexically based. Finally, significant differences found with children matched on MLU, vocabulary and Leiter memory-IQ Indicate that difficulties in these domains of cognition cannot explain the deficits.

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P4-14

Phonological priming in children with Specific Language Impairment: Evidence from the cross-modal picture-word interference paradigm

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The cross-modal picture-word interference task is a widely used paradigm to explore the time course of phonological activation during lexical access (e.g., Schriefer, Meyer & Levelt, 1991). Our study used this task to explore the time course of phonological priming in children with specific language impairment (SLI). Children were asked to name pictures on a computer screen while listening to auditory non-word distractors over headphones. Previous studies (Brooks & MacWhinney, 2000; Seiger & Brooks, submitted) used this task to present words, as opposed to non-words, as distractors; these studies revealed facilitation from distractors sharing onsets with the name of the picture (e.g., hearing *cat* when asked to name a picture of a car), under timing conditions in which the distractor occurred immediately after the picture. When the distractor occurred prior to the picture, children with SLI experienced interference from the phonologically-related distractors (i.e., slower naming of a picture paired with a phonologically-related distractor in comparison to an unrelated distractor). This phonological interference effect was not observed in children with typical development (Brooks & MacWhinney, 2000; Seiger & Brooks, submitted).

The present study extends the exploration of phonological activation in children with SLI using distractors that are not candidate names of pictures. Fifteen children with SLI (8-10 year-olds), 45 children with typical language development (15 5-year-olds, 15 7/8-year-olds, 15 9/11-year-olds) and 15 adults were instructed to name pictures as quickly as possible while ignoring auditory distractors heard through headphones. Phonological priming was measured as the difference in reaction times for trials for which the distractor was phonologically related to the name of the picture (e.g., hearing the non-word *snaze* paired with a picture of a snake) compared with trials with unrelated distractors (e.g., hearing *snaze* paired with a picture of a cup). Four blocks of trials varied the timing of the distractor relative to the picture. Two 'early distractor' blocks used stimulus asynchronies in which the picture occurred 100 or 300 ms after the offset of the distractor. The two 'late distractor' blocks used stimulus asynchronies in which the picture occurred 100 or 300 ms prior to the onset of the distractor.

Children with SLI failed to show phonological priming of reaction times in either 'early distractor' block, in contrast to the large priming effects observed in all groups of typically-developing children and adults. In both 'late distractor' blocks, children with SLI showed phonological priming, whereas all of the other groups showed priming only in the +100 ms stimulus asynchrony condition. That is, children with SLI showed a late phonological priming effect occurring beyond the point in time at which phonological processing terminates in children with typical language development (as young as 5 years of age). Error analyses showed similar trends. Taken together, the results indicate a delayed pattern of phonological activation during lexical access in children with SLI.

P4-15

Pragmatic impairments and ToM in two different groups of children with SLI

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Pragmatic skills and language abilities are related to theory-of-mind in a general way. There have been recent suggestions that children with specific language impairments show difficults on their ToM abilities because of their communicative deficits. Most of the studies in ToM area are focused on autistic (Baron-Cohen, Leslie and Frith, 1985; Frith and Happé, 1994) or on well delimited SLI children (Bishop and Frazier, 2002; Farmer, 2000), and their results explain that common impairments found in language ability may influence in their performance in ToM tasks. Nevertheless, few studies have shown how general performance in standard ToM tasks, as the false belief task, could lead us to confuse autism with other disorders like children with SLI or Pragmatic Linguistic Impairments (Botting and Conti-Ramsden, 1999). Therefore, the aim of this study is to examine two different profiles of SLI, one with more pragmatic difficults and the other one without them, in order to explore how pragmatic impairments may influence in ToM abilities when emotion and intention understanding tasks are used. These findings may be helpful to explore the "borderlands" of autism and SLI, and also to consider ToM tasks as a "tool" that could be used in the diagnostic of subtypes of SLI with sever pragmatic deficits (Farmer, 2000; Miller, 2001). To achieve this goal, we compared a group of 11 children with SLI without severe pragmatic impairments (average age: 71 months) with a group of 9 children with SLI plus pragmatic impairments (average age: 69 months) and their respective control groups (average age: 70 months). We considered they had pragmatic impairments when their scores in the ELI pragmatic subtask (Children's linguistic evaluation) were pc < 15. Then, they were administered ToM (emotions and intentions understanding) and pragmatic of language tasks (set phrases, graphic jokes and riddles). Besides this, emotion understanding tasks also yielded high correlation when the face of the subject was omitted. The results scales suggest that tasks concerning to communicative intentions comprehension (Happé, 1997), set phrases and riddles show more differences between the two groups of SLI. These differences are an important point to understand how language pragmatic ability is closely related to ToM performance in children with SLI and pragmatic impairments.

P4-16

Speaker's and listener's referential communication skills in Spanish children with and without Specific Language Impairment

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Introduction: Children with Specific Language Impairment (SLI) have limitations in language processing. Only some few studies have analyzed speakers' referential communication skills of children with SLI/LI, and none of them in Spanish-speaking children. Previous works disagree about language impaired children's failure to communicate about referents (e.g., Bishop & Adams, 1991; Reuterskiöld-Wagner et al., 2001). There are no published works about listeners' referential communication skills of children with SLI. The present study analyzed the performance of speakers and listeners with and without SLI in several referential communication tasks.

Method: *Participants*; Eleven children with SLI (*M* = 9;5) and 11 age-matched children with Typical Language Development (TLD, *M* = 9;8), living in Spain, participated. The groups were matched for age and gender. They had normal hearing and performance IQs.

All were Spanish-speaking children, with some exposure to Catalan language, who lived in Spanish-speaking homes. Children referred as SLI scored: (a) at least 0 SDs below on the average SD of all the language-relevant subtests of the Spanish ITPA; and (b) at least 1.0 SDs below on the average SD of at least two of the language-relevant subtests of the Spanish ITPA. Their SLI status was confirmed by the judgments of their teachers, and parents (who filled a questionnaire out).

Procedure; All children performed the roles of speaker and listener for a Word Pairs referential communication task. The two words in each of the 30 Word Pairs had a strong semantic association. They were translated into Spanish from the previous versions in Catalan (Girbau & Boada, 1996) and English (Asher & Oden, 1976; Rosenberg & Cohen, 1964). First, all children produced 30 one-word messages for the Word Pairs, to communicate efficiently with an imaginary listener. Their messages were classified as either efficient or non-efficient by two judges. One month later they performed this task as listeners. Particularly, each child had to evaluate 30 other children's messages for the Word Pairs as either efficient or non-efficient for a potential listener. Finally, all children performed the speaker's role in a referential-ecological communication task (Boada & Forns, 2004). Particularly, they described locations for several objects, with different complexity, placed on a board representing a room.

Results and discussion: Speakers with SLI performed the Word Pairs referential communication task significantly more poorly than age-matched children with TLD. On the other hand, the number of correct evaluations was significantly lower in children with SLI than in children with TLD. Results support a deficit in SLI listeners' ability to appraise another person's communication performance.

Finally, the number of efficient messages for the spatial referential communication task was significantly lower in children with SLI than in children with TLD. Results support a deficit in SLI speakers' ability to communicate complex spatial locations.

The present data about the speaker's role, agree with Bishop & Adams (1991), who found that children with SLI performed a visual referential communication task more poorly than age-matched children with TLD. Implications for speech therapy and the detection of children with SLI are discussed.

P4-17

Understanding spatial language – Typical development and Specific Language Impairment

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Children with language difficulty are often reported by clinicians to have difficulty with abstract language, such as spatial terms. This group have also been increasingly reported to have specific difficulties with non-verbal spatial tasks such as pattern recall (Hick et al, 2005) and design copying (Marton, in press). In a study by Phillips et al (2003) a new task was reported called the TRUST (Test of Receptive Understanding of Spatial Terms). The task is similar to the TROG in nature but has two elements – items that require understanding of spatial terms and non-spatial control items matched for syntactic complexity. Their study reported disproportionately poor understanding of spatial terms for those with William's Syndrome even compared to a learning disabled control group who (like the TD controls) showed the reverse pattern – an advantage for spatial items. In their study a very wide age range of participants were used and few developmental trends were identified.

The present study aimed to investigate spatial term understanding in younger primary school age children with and without specific language impairment using the TRUST. The participants were 20 children with typical language development aged between 3;6 and 10;3 and 20 children with SLI aged between 5;6 and 10;5. The groups were matched on BPVS raw score and were not significantly different on non-verbal IQ, gender or ethnicity.

Developmental trends were found for both spatial and non-spatial items. For both the TLD and the SLI groups, a spatial advantage was identified. The SLI group performed more poorly on both TRUST scores, but this was not significant until NVIQ was included as a covariate. In addition, a different pattern of results was identified with older and younger children. When the groups were split into Key stage 1 (up to 7) and Key stage 2, developmental trends were less evident for the SLI groups, suggesting that development is not linear. Furthermore, the youngest SLI children showed equal ability on spatial and non-spatial items, whereas older SLI children showed a marked spatial advantage – even more pronounced than that of the TLD Key Stage 2 children.

Further analyses are ongoing to examine error patterns and the relationship between spatial language, vocabulary and cognition scores. However the findings seem to suggest that unlike the original William's Syndrome participants, the difficulties with spatial terms seen in SLI are closely associated with language skill per se and do not represent an 'additional' difficulty.

P4-18

Comprehension of relative clauses in Hungarian children with and without language disorder

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The acquisition of complex sentences with relative clauses has traditionally been an area of interest in psycholinguistics and several different hypotheses was formed about specific processing strategies of this certain sentence type. However, in languages like English the hypothesized strategies can not be examined separately because certain structural features are typically not independent, e.g. the case of the head and the embedding position of the relative clause. As opposed to this the properties of Hungarian language make it possible to distentangle some structural aspects which is important for the independent examination of the hypothesized strategies. The main questions of the presented research was whether there is evidence for specific strategies in sentence comprehension, and whether children with developmental language disorder use the same or deviant strategies. In linguistic terms, is the comprehension of relative clauses affected by (i) the position of the relative clause (center- or right embedded) (ii) the case of the head (nominative or accusative) (iii) the relation of head case in the main and the relative clause (SO, OS vs SS, OO types) and (iv) the change of perspective between the main and the relative clause. We tested 24 children, half of which were identified as language impaired by standard selection criteria. We compared their performance with a control group of typically developing children between the age of 7-8 years matched individually on receptive vocabulary level (PPVT raw score). We examined the comprehension of different relative clause constructions in an act-out task with toy animals. At group level there were significant differences between the groups in both tests and all the structural differences turned out to influence the comprehension performance significantly. However, there were virtually no group*structure interactions, which means that the very same structures caused difficulties for the typically developing group and the language disordered group as well. The same pattern of performance between the groups supports the non-representational hypotheses of language disorder. The different case marking of the head in the main and the relative clause had no effect, but there were independent preferencies for the subject role in the relative clause and for the object role in the main clause. Perspective change which is related to word order differences between main clauses in Hungarian rather than the subject role also made the performance of both groups lower. Comparing these results with the earlier literature reveals the importance of some nonlinguistic factors crosslinguistically.

P4-19

Phonological cues to the syntactic categorization of nouns and verbs: Evidence from German-learning 16 month olds

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Previous research has shown that infants can use semantic cues to syntactically categorize new nouns and verbs, relying on the tendency for nouns to denote concrete objects and verbs to denote actions (e.g. Bates & McWhinney, 1989). Beside, distributional information like syntactic environments of words provides indication for noun and verb assignments which infants are able to utilize (e.g. Höhle, Weissenborn, Kiefer, Schulz & Schmitz, 2004; Mintz, 2006). Bearing in mind the word form itself, there are also phonological cues correlating with the syntactic categories of nouns and verbs in English (Kelly, 1996). It has been shown that three-year-olds have learned the fact that English nouns tend to contain more syllables than English verbs (Cassidy & Kelly, 1991). As another possible phonological cue to word category, our study examined phonotactic structure. Whether children are aware of such a phonological cue and can use it to syntactically categorize new nouns and verbs has not yet been addressed.

In German, a monosyllabic word with a short lax vowel followed by two consonants, whereas the second one is /t/, could either be a noun (e.g. /fɛlt/ field) or an inflected verb (e.g. /fɛlt/ falls) with equal probability. In contrast, the same form with a long tense vowel is much more probable to be an inflected verb (e.g. /fe:lt/ is absent) than a noun (e.g. Wiese, 1996).

Given infant's early sensitivity to phonotactics (e.g. Friederici & Wessels, 1993; Mattys & Jusczyk, 2001) we investigated whether German-learning children can use these regularities to syntactically categorize novel nouns and verbs. Using the headturn preference paradigm 16-month-olds were presented with sentences containing a novel word of the crucial phonotactic structure in either a noun or a verb context:

noun context 1:	Der /tɛft/ wohnt im Dorf.	(The /tɛft/ is living in a village.)
noun context 2:	Der /te:ft/ wohnt im Dorf.	(The /te:ft/ is living in a village.)
verb context 1:	Der Tiger /tɛft/ im Zoo.	(The tiger /tɛft/s in the zoo.)
verb context 2:	Der Tiger /te:ft/ im Zoo.	(The tiger /te:ft/s in the zoo.)

We hypothesized that the children are sensitive to the greater phonotactical restriction in the noun case and therefore expected a difference in listening time for the two noun conditions but not for the two verb conditions. The results confirmed our hypothesis: In the noun contexts the children listened longer to the sentences containing a novel noun with a long tense rather than a short lax vowel. In the two verb contexts no difference occurred.

The results indicate that German 16-month-olds have gained some knowledge about the correlation of the phonotactic structure and the syntactic use of words. Our data provide the first evidence that in addition to semantic cues and distributional information, features of the phonological word assist infants to syntactically categorize nouns and verbs. Furthermore, our results indicate that phonotactic structure plays an important role in early language perception beyond the detection of phrase and word boundaries within continuous speech (e.g. Mattys, Jusczyk, Luce & Morgan, 1999).

P4-20

Are 16-month old infants aware of Allophony?

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12-month-old infants know segments/phones of their language (Werker&Tees, 1984; Kuhl et al., 1992), however it is still unclear whether they know which phonological contexts a particular phone can(not) occur in. The context information is especially relevant for cases of allophonic variation whereby a phoneme is realized differently depending on its environment, e.g. in English the velar stop *k* is 'palatal/soft' before front vowels (*k'*, as in *key* [k'i:]) and 'velar/hard' before back vowels (*k**, *cool* [k*u:l]). Our study aimed to establish whether 16-month-old American infants are aware of this allophonic rule of English.

The experiment used a head-turn preference paradigm and followed a 2(*phonemic/allophonic*) x 2(*licit/illicit*) design (4 trials per cell/participant). In the phonemic condition the licit variant contained English-like syllables, e.g. *shi* & *sho*, whereas syllables in the illicit variant started with a non-English consonant, e.g. *xi* & *xo*, *x* = a voiceless velar fricative. Given the prior literate on infant knowledge of their native phonemes, we expected infants to show significantly different listening times to these licit vs. illicit syllables. In the allophonic condition the licit variant contained combinations of *k* and a vowel that are legal in English, e.g. *k'i* & *k*u*, whereas the illicit variant included the same legal phones of English but combined in an illicit way, e.g. *k*i* & *k'u*.

Data collected so far (13 out of a future 16 participants) demonstrate a trend towards a novelty effect in the phonemic condition (mean listening times: licit=6.5 sec, illicit=8.6 sec, $t(12)=1.9$, $p=.077$), but lack of any effect in the allophonic condition (licit=7.2 sec, illicit=7.3 sec, $t(12)<1$, $p>.1$). These results demonstrate that 16-month-olds accept sequences of phones as long as each of the sounds occurs in their language, regardless of whether the phones are combined in a phonologically licit way. Thus infants first form segmental categories, e.g. on the basis of distributional information in speech (Maye et al., 2002), and only subsequently verify their allophonic status, e.g. through a learning algorithm that combines statistical and possibly innate knowledge (Peperkamp et al., 2003; 2006). More generally, our results corroborate prior claims that segment-size categories are formed early in the development, whereas allophonic co-occurrence patterns appear to be defined later on the basis of segmental categories rather than holistically (Swingley, 2005). We discuss an apparent inconsistency between our results and previous findings of 9-month-old infants' sensitivity to their native language phonotactics (Friederici&Wessels, 1993; Jusczyk et al., 1993; 1994).

P4-21

Hemodynamic response to stimuli with varying temporal complexity in healthy neonates: A near-infrared-spectroscopy study

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The perception of speech requires rapid extraction of the linguistic content from the complex incoming acoustic signals. These signals contain information on different time-scales differentially relevant for specific aspects of the linguistic analysis: While rapid transitions (<25 ms) between formants convey most of the segmental information, suprasegmental modulation of spoken language requires slower temporal transitions (> 200 ms). As an example, prosodic information may rely on a modulation over the full duration of a sentence, while a single consonant may alter the semantic content (mouth/mouse).

Concerning the hemispheric lateralization linguistically based models have proposed a left hemispheric dominance for segmental and a bilateral, more dynamic representation of suprasegmental processing (Friederici & Alter, 2004). Recent studies investigated the

interhemispheric specialization from a psychoacoustic point of view by showing a superiority of the left secondary acoustic cortex for the detection of rapid temporal transitions while the right hemispheric secondary acoustic pathway seems to be superior in processing slowly varying segments and spectrally complex signal properties (Boemio et al., 2005; Schönwiesner et al., 2005).

Since language acquisition in infancy is thought to critically depend on the integration of suprasegmental and segmental information, the ability to decode different temporal features of the auditory stream can be considered mandatory at a very early age (Benasich & Tallal; 2002). Despite its relevance little is known about the underlying pathways and the development of interhemispheric specialization for processing auditory information during infancy. Functional imaging studies suggest a left hemispheric dominance for the processing of normal compared to reversed speech in newborns and 3 month old infants (Pena et al., 2003; Dehaene-Lambertz et al., 2002, 2006). Homae et al. (2006) demonstrated a right-hemispheric dominance for processing sentence prosody in 3 month olds, which seems to continually develop into the more proficient speaker's dynamic dual pathway representation (Wartenburger et al., 2007).

In this study we focus on the lateralization of processing temporally different acoustic stimuli in newborns. We used the identical stimulus material as Boemio and co-workers had used in adults (2005) and presented these slowly (> 160 ms) and fast (< 25 ms) modulated acoustic stimuli to 24 neonates (age 3.58 ± 1.38 days, 12 boys). We simultaneously recorded the hemodynamic response using Near-Infrared-Spectroscopy (NIRS) as well as the electrophysiological response by using EEG. Comparing silence with stimulation periods neonates show an adult like hemodynamic response function. Furthermore our results reveal a significantly stronger hemodynamic response for fast modulated as compared to slowly modulated stimuli in left superior temporal areas. Slowly modulated stimuli lead to a stronger right hemispheric activation. These data suggest that an asymmetric sampling of temporal features as it was suggested for adults (Boemio et al., 2005) seems already to be present in neonates.

P4-22

The effect of sentence focus on two-year-olds' visual attention

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Children's visual attention matches the words they hear (Swingley et al. 1998). However, since utterances contain both given and new information, the information conveyed by each single word is of different importance. Obviously, new information is the one of importance. In German as in many other languages new information is acoustically highlighted (stressed). In our studies we examined whether 24-month-olds know about the importance of stressed words and therefore focus their visual attention to a corresponding referent. We conducted an eye-tracking study and compared children looking times to referents of stressed words (new information) and unstressed words (given information).

Children were presented with two successive pictures shown on a computer screen: A context picture containing a single element which served as the given element in the following target picture. The target picture showed two elements (the given and a new one). The context picture was visible for three seconds during which the experimenter labeled it twice (e.g., *Look, there's a dog. Look, the dog*). After the context picture had disappeared but before the target picture was presented, the experimenter described it with stress on the word corresponding to the new element (e.g., *The dog has the BALL).* Immediately after the sentence was finished, the target picture was presented for six seconds. In a second condition the givenness/newness of the elements in the target picture were reversed. This resulted in a verbal description with stress in a non-final position (e.g., *The DOG has the ball*). The results show that children looked longer at the new element (58.66 %, $p<0.05$, t-test) which corresponded to the stressed word than to the given referent of the unstressed word (41.34%).

An additional set of children participated in two control conditions. We established a Newness-Only Condition in which no verbal description of the target picture was given and a Stress-Only Condition where both elements in the target picture were equally new but only one element was stressed in the verbal description. The results indicate neither an effect for stress alone (53.72% looking to stressed element) nor for the new element alone (55.84% looking to the new element). However, when analyzing the first two seconds of the target picture only, we found a clear newness-effect. As expected, 24-month-olds looked longer to the new element (62.99%, $p<0.05$, t-test).

The findings suggest that while an object's newness naturally attracts children's attention, stressed words for new information focus their attention on the corresponding referent.

P4-23

How much does a 5 month old Plymothian infant know about the South West accent?

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Little is known about the perceptual abilities of very young infants in detecting and contrasting different accents in speech. Previous research has suggested that American infants at 5 months are able to discriminate between American and British accented English (Nazzi et al, 2000). Other research has shown that American infants at 6 months are able to discriminate between American and Australian accented English, while Australian infants are not able to do this at 6 months but are able to perform this discrimination at 3 months (Kitamura et al, 2006). In order to examine whether these capabilities are due to early learning of accent-specific features, or to general abilities to distinguish between any type of accent, this study aims to investigate whether British infants at 5 months are able to discriminate between their home accent (Plymouth) and other regional variations of English (i.e. Welsh), and whether they are able to discriminate between two regional variations of English that are not their home accent (Welsh versus Scottish). If early accent discrimination is based on the recognition of a familiar accent, then no discrimination should occur between Welsh and Scottish accent. If on the contrary this ability relies on a general sensitivity to prosodic (and phonetic) differences, discrimination should be obtained as well for the Welsh/Scottish contrast. Five-month-old infants were habituated with sentences uttered either with Plymouth, Welsh and Scottish accents, and tested on the alternation of the familiarisation accent plus a new one. Average looking times for each accent were computed and analysed to look for a difference in looking times between the accents. Preliminary analysis of data from 7 infants that have been tested so far suggests that British infants are able to discriminate between their home accent and another regional variation of English (Welsh), replicating and extending the data collected by Nazzi et al. and by Kitamura et al. with American and Australian infants. Ongoing study testing discrimination between Scottish and Welsh accents will shed some light on the language-specific versus general origins of such a capacity.

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P4-24

Early understanding of closely related varieties: A pilot study

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Inter-Scandinavian communication traditionally takes place on Scandinavian languages, a custom strongly encouraged by most Nordic authorities and governments to support Scandinavian languages in a globalised world. The recommendations clearly rely on the fact that the mainland Scandinavian languages Danish, Norwegian and Swedish are generally mutually intelligible among adults, although there are important differences in the degree of understanding between the six possible language combinations. Previous research has shown that mutual understanding in adults seems to be asymmetrical in several respects. This is most clearly revealed by looking at Swedish-Danish data from different researchers: Danes understand more Swedish than vice versa. Several factors have been considered to cause this asymmetry, such as attitude (Delsing/Lundin-Åkesson 2005), writing skills (Gooskens/Doetjes, personal communication), contact to the neighbour language via television (Bø 1978, Delsing/Lundin-Åkesson 2005), and "asymmetric" linguistic distances (Gooskens 2006).

The main purpose of our pilot study was to simulate a first-contact-situation and to investigate (a) children's comprehension abilities of a closely related variety and (b) measure the impact of linguistic distances on mutual intelligibility. Subjects were 20 Danish and 20 Swedish speaking 5-year-old preschoolers from outside the border regions and with no contact to the neighbour language. Stimuli material consists of picturable cognate nouns from the Swedish and Danish CDIs. For every word pair, the Levenshtein distance based on features was calculated. According to these values, a set of stimuli was created with nouns forming a continuum with respect to their linguistic distance between the two languages. The stimuli material was auditorily presented to the subjects, while four pictures per stimuli were visually presented. Subjects were instructed to map visual and auditory information by pointing to the corresponding picture.

Results revealed that computationally calculated linguistic distances using the Levenshtein algorithm (Heeringa 2004) make it possible to predict children's performance to a certain degree. However, the overall degree of comprehension is clearly lower than adult comprehension scores, a finding that is consistent with Nathan, Wells & Donlan's (1998) results, showing that children's ability to map foreign dialect stimuli onto their own phonological representations increases at least between four and seven years of age. Furthermore, comprehension asymmetry in this experiment was less strong than in adults, a finding suggesting that adult mutual intelligibility is enhanced by extra-linguistic factors.

Building on the results of the present investigation, further research in our project will zoom into two specific dialect continua in Scandinavia and further evaluate the role of the age factor in understanding of closely related varieties. In this way, we aim at establishing a model of children's attuning to the native variety while maintaining some flexibility for closely related varieties.

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P4-25

Prelinguistic infants learn novel phonological patterns from mothers' contingent speech

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How do infants learn to produce sound sequences that obey the phonotactics of the ambient language? Previous research has shown that prelinguistic infants use social feedback that is contingent on their babbling to guide their productions towards well-formed speech (e.g. fully-resonant vowels and rapid consonant-vowel transitions). In the present study we assessed the influence of social feedback on learning rules that govern patterns of sound production.

To measure changes in vocal production, we presented infants from an ambient English linguistic environment with sounds they were capable of pronouncing but don't typically produce. As feedback, we used words from the Nigerian language Yoruba. Many Yoruban words have vowel-consonant-vowel (VCV) form, and by 10 months Yoruban infants' disyllables have VCV form (e.g., "aba") in contrast to English CVCV (e.g., "baba"). Using a vocal learning paradigm (described below), we asked mothers to respond to their infants' babbling using Yoruban words to see if infants could extract the VCV syllable rule.

Thirty-two mothers and their 9-month-old infants were recorded as they played together. The play session was divided into 10-minute periods of Baseline recording, Social Response, and a second Baseline. Mothers received instructions from an experimenter via wireless headphones. During the Baseline periods, all mothers were instructed to play as they would at home. During the Social Response period, we manipulated the form and timing of mothers' reactions to their infants' babbling. Half the mothers (Contingent condition) were instructed to immediately respond to their infants' sounds by smiling, moving closer, and touching them. When they responded, they spoke a Yoruban disyllabic word, such as /aba/ or /idi/. The other half of the mothers (Yoked Control condition) were instructed to react based on response schedules and behaviours that were generated by the Contingent mothers. The timing and form of Yoked Control mothers' responses were thus linked to those of the Contingent mothers so that the Control infants received the same amount and type of social and vocal stimulation as the Contingent infants, but the stimulation was not synchronized with their vocalizations.

Across the three periods, only Contingent infants demonstrated significant changes in their production of disyllables that obeyed Yoruban (VCV) phonological form, $F(2, 30)=3.58$, $p=.04$. They showed a significant increase from Baseline-1 to Social Response, $t(15)=-2.68$, $p=.017$. When infants produced VCV disyllables, their phonemes were not the same as those of their mothers' utterances, suggesting that phonological learning was not imitative but rather a form of pattern recognition. Infants continued to produce these new vocal forms during Baseline-2, thus they were able to maintain the new pattern of articulation even in the absence of continued feedback. Yoked control infants did not learn the VCV pattern.

These data represent the first evidence of statistical learning in vocal production. Infants extract phonological patterns when their caregivers' speech is contingent on their babbling. Thus caregivers' reactions to babbling, affords infants opportunities to refine their

vocal repertoires. Socially-guided learning is a potential mechanism underlying the acquisition of novel phonological patterns in prelinguistic infants.

P4-26

Infant perception of speech in noise and its relation to later language outcomes

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The present study is designed to examine long-term language outcomes in children who were tested as infants in a study of speech perception in noise. Newman (2005) examined infants' ability to distinguish between their own names and stress-matched foils in the presence of multi-talker background noise. To examine this, four experiments were conducted with infants aged five months, nine months, and thirteen months. This study indicated that, by five months, many (but not all) infants are able to recognize familiar words such as their own name in the presence of multi-talker babble when the target name is at least 10 dB louder than the distracter. 18 out of the 25 infants that were tested demonstrated this ability. By thirteen months, 17 out of 25 participants were able to perform this task at a 5dB signal-to-noise ratio.

Recent research suggests that a link exists between infant speech perception and later language ability. Newman et al. (2006) found that infants who performed well in speech segmentation tasks (in quiet) had better linguistic outcomes four years later. However, infants are frequently not in quiet environments; many of their opportunities to learn language occur when there are other voices talking in the background. If so, a child's ability to perceive speech in noise might also relate to their eventual language outcomes. It is possible that the infants who were not able to recognize their own name in the Newman (2005) study might have difficulty acquiring other language skills. These infants may lack the attention abilities required to focus on important aspects of the sound signal and block out extraneous noise.

This study investigates the syntactic, semantic, and phonological awareness outcomes of the participants in the original study. It compares those participants who were more successful in the original study (those who attended longer to their own name than to the stress-matched foil name) to those participants who were less successful in order to determine if any significant differences exist between the two groups. Linguistic skills are assessed with commonly used standardized tests of expressive and receptive language ability. Additionally, commonly used intelligence and attention tests are used to rule out cognitive influences on language skills. The purpose of this study is to determine if differences in language ability exist between those children who failed to identify their own name in noise as infants and those who were successful.

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P4-27

Syllabic complexity and word segmentation

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Introduction: It has been shown that: (i) the syllable is a productive unit for the description of phonological knowledge; (ii) syllable boundaries are easily detected by speakers; (iii) complexity has an impact on phonological processing. However, the impact of syllabic complexity in phonological awareness has not been systematically tested and the processing time used to perform word segmentation tasks under a phonological perspective has not been thoroughly investigated. In this poster, we will consider the syllable internal complexity and test its relation with the time used during word segmentation tasks performed by Portuguese children. Moreover, we will explore the correlation between phonological development and the ability to perform tasks evaluating the children's phonological awareness.

Problem: Treiman & Zukowski (1991) report that, under the performance of word segmentation tasks, the reaction time for simple onsets is lower than the one for branching onsets. However, studies referring to the relation between phonological units and the reaction time associated to their processing are scarce in the literature. On the other hand, it is known that non branching Onsets are acquired before branching ones (Fikkert 1994, Bernhardt & Stemberger 1998, among others); Portuguese children show a similar developmental pattern (Freitas 1997). Our purpose is to investigate whether this developmental pattern constrains the children's responses to word segmentation tasks, by using the reaction time measurements as evidence to discuss the aspect under analysis.

Data: We studied 80 Portuguese children's ability to segment 27 dissyllabic words with word-initial V, CV or CCV structures. The children's mean age is 64 months (50-77 months). They were submitted to word segmentation tasks and the reaction time for each stimulus was registered in the program E-prime. A statistical analysis was performed by using SPSS (15.0).

Results and discussion: All children exhibit more difficulties when taping words with V and CCV word-initial structures than words with CV; the success scores for dissyllabic words are: (a) simple onsets (73,8%); (b) empty onsets (60%); branching onsets (22,5%). In branching onset the results are worst when C2 is /l/ (6%) and become better when the Onset shows a /r/ as C2 (50%); these results show that the segmental inventory is a relevant variable for the performance of word segmentation tasks. The most common errors detected include (i) word-final vowel insertion, (ii) vowel epenthesis in Onset clusters and (ii) syllable merging. Considering only the correct segmentation, we attested that children take more time segmenting dissyllabic words with branching onsets than with non branching ones; there are no statistical differences when we consider the time used to segment dissyllabic words with initial empty or with simple onsets. By performing correlation tests, we confirmed that children show progress performing segmentation tasks as they grow older. This research enabled us to confirm the effect of complexity in the processing time used by the children evaluated; the results mirror the children's developmental pattern for Onsets. The data work as empirical evidence for the unmarked status of both simple and empty Onsets, against the marked status of branching Onsets.

P4-28

The relationship between babble, word recognition, word segmentation and first words in individual infants

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How do children develop the basic knowledge and skills needed to begin to learn to talk? We know little about the ongoing relationship between emergent abilities to perceive speech and produce vocalisations (babble), and we also lack clear evidence regarding the relationship of those abilities to the concomitant onset of word learning and use. This study explores this relationship. It is a preliminary report of a larger study of 60 children building on variability (i.e., individual differences) in the development of word recognition and segmentation, consistent consonant production, and word production, to test a model of the interactions between these skills. The model is based upon Dynamic Systems theory (Thelen & Smith, 1994), which assumes that when relatively simple skills combine, more complex behavioural patterns can emerge. In this case, basic vocal and perceptual skills eventually lead to the onset of an early phonological system.

We evaluate production skills using weekly recordings from age 9 months to the point where the child makes reliable and consistent use of two consonants or Vocal Motor Schemes (VMS). Perception capacity is gauged using two headturn tasks (HT), a word-form recognition test at 10 months and a word segmentation test at 11 months. Advances in word production are assessed based on monthly home recordings up to age 16 months.

VMS production: To date, 22 infants have begun to participate. Of these, 15 have developed one VMS and 11 two VMS (mean age 10 and 10.2 months, resp.). The most favoured early VMS are [t/d] (73% of children with one or more VMS), [p/b] (53%), [m] (27%) and [k/g] (20%).

Word Recognition at 10 months: Based on attainment of at least two VMS by the time of the HT session, there is a trend towards differential behaviour (as measured by looking time towards familiar versus rare words) between the 'VMS' infants (N=7) vs. the 'non-VMS' infants (N=10) ($p=0.079$). Unexpectedly, the VMS infants look longer to the rare than the familiar words, exhibiting a novelty effect. Although the samples are currently small, the VMS infants are distributed bimodally, with some attending more to familiar and others more to rare words. The non-VMS children typically show no preference. We will have tested about 50 infants by time of presentation, with enough statistical power to detect any group differences.

Word Segmentation: We expect VMS infants to be more successful at segmenting words. We will have tested about 50 infants by time of presentation. Results from the seven infants tested to date reveal no clear effect.

First word use: Around 35 infants will have completed the study by time of presentation. We will profile these infants, relating age at VMS mastery to performance on the perception tasks as well as to age at first words.

Quantitative analysis of both production and perception data will provide a basis for developing and testing a model of first word learning that reflects the individually variable interaction of perceptual and production skills.

P4-29

Acquisition of Spanish's "*Ser* and *Estar*": Experimental evidence for sensitivity to event type

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Native-Spanish speaking children reportedly do not master the contrastive uses of the Spanish copulae, *ser (s)* and *estar (e)* both 'be', until preadolescence. Results from a first experimental study consisting of an elicitation task to test whether children aged 4;5 to 10;1 know the semantic contrast between *ser* and *estar* with adjectives and locatives led Sera (1992) to conclude that they overuse *estar* in marking events with locatives. Following from this study, Schmitt *et al.* (2004) conducted comprehension experiments using picture matching and acceptability judgment tasks to test if four and five-year-olds know the relevant semantic principles involved in choosing between the copulae. Like Sera (1992), they concluded that young children do not have mastery of the semantic distinctions between the copulae and, in accord with Sera's findings, prefer *estar* in *ser*-favoring contexts. Both studies suggest that children resort to syntactic cues to discriminate between the copulae.

The accepted explanation for the apparent late acquisition of the copulae lies in the complexity of their distributive properties. Classic constructions leading to the classification of the two verbs under a dichotomous system include *Sofía es(s) alta/is tall* and *Rodrigo está(e) triste/is sad*, one placed under an individual-level/IL category to denote states of permanence/inherent qualities and one a stage-level/SL category for temporariness/accidental qualities, respectively. However, both verbs violate these general categories more often than not (e.g. de Mello, 1979; Schmitt, 1993; Escandell-Vidal & Leonetti, 2002), as in *Memo es(s) joven/is young* and Citlali *está(e) muerta/is dead*. Furthermore, in a recent grammaticality judgment task I gave to adults from Latin America and Spain to characterize the verb's uses with adjectival predicates, results revealed the expected pattern and that in Latin American Spanish *estar* denotes IL qualities of both animate and inanimate things, as in *Ricardo está(e) gordo/is fat* and *La casa está(e) grande/the house is big*. Additionally, I reported in an earlier study of spontaneous production data in the CHILDES database of native-Spanish speaking children between ages 1;7 and 2;10.23 that they correctly use the Spanish copulae contrastively and productively.

To establish whether children comprehend key semantic cues (time, animacy, and physical/psychological states) necessary for selecting the correct verb given an event type, I conducted in the present study a forced-choice picture-matching elicitation task with two groups of monolingual Mexican-Spanish speaking children: 43 aged 3;0 to 4;0 and 16 aged 2;1.0 to 2;9.0. The stimuli were bimodal in character: the children were read to and pictorially shown 16 different stories where a character either maintained or altered its physical or psychological state. After the story the children described the character(s)'s ending state using either *ser* or *estar* with an adjectival predicate. The results reveal that both groups performed above chance on the test items (proportion of correct responses 81% for children ≥3;0 and 76% aged ≤2;9.0), thus selecting the correct verb that matched the experimental stimuli. In conclusion, these results support the hypothesis that young children are indeed sensitive to semantic cues, contrary to Sera (1992) and Schmitt *et al.* (2004).

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P4-30

Voluntary motion in French and German child language

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Developmental research concerning children's spatial representations indicates that two types of factors may affect first language acquisition: universal cognitive determinants and language-specific constraints. With respect to typological constraints, Talmy (1985, 2000) differentiates languages that are "verb-framed" if they typically conflate Path in the verb (e.g. Romance) vs. "satellite-framed" if they conflate Manner in the verb root and express Path in satellites (e.g. non-Romance Indo-European languages, including Germanic). This typology has cognitive implications, suggesting that speakers' attention should be directed to different aspects of reality depending on the lexicalization patterns of their mother tongue. More specifically, Slobin proposes (2003, 2006) that it should be easier for speakers to express information in frequent finite verb forms than by means of peripheral devices (adverbials, subordinate clauses). It should therefore be easier for speakers of satellite-framed -languages to encode Manner and Path at the same time than for speakers of verb-framed languages.

The present study tests these hypotheses by comparing monolingual German and French adults and children (several age groups between 3 and 11 years), who had to narrate short animated cartoons showing spontaneous motion events carried out by an agent in different manners and along different paths (up, down, across). The results show first some developmental progressions in both languages that indicate an increasing capacity to encode Manner and Path together. However, response patterns differ across languages. As expected, German speakers of all ages frequently encode both Manner (in verb roots) and Path (in satellites). From three years on German children pay much attention to manner, using a wide range of manner verbs in combination with particles, which do not require inflections (unlike prepositional phrases) and are therefore easy to use. In contrast, the responses of French speakers vary with age and event types. French responses focus most frequently on Path. Responses combining Manner and Path mostly occur at adult age and they are less frequent than among German adults. Children tend to combine Manner and Path earlier and more frequently with upwards motion, because they use a verb that lexicalises both informational components (*grimper* 'to climb up'), not available for other event types. Crossing events showed an unexpected pattern in French in that young children tended to express manner alone, presumably because they did not have access to the relevant path verb (*traverser* 'to cross'). Finally, French responses showed an overall tendency to distribute Manner and Path information across utterances in discourse, rather than to encode both in compact utterances.

As predicted on the basis of typological properties, Manner is more salient to children and their utterances are more compact in German than in French. These results are consistent with those reported by recent studies focusing on other child languages (Slobin, 2003, 2006; Hickmann, 2006). They support the view that children construct the semantics of space partially in accordance with the language-specific characteristics of their mother tongue and despite general developmental progressions that also show cognitive determinants of language acquisition.

P4-33

Aspect is not first: Children do not mistakenly map inherent lexical aspect to tense morphology

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It has been found that at the start of development, children's use of tense morphology is mostly under-extended to certain inherent lexical aspects, so that past forms are mostly used with telic and punctual verbs, and present forms, with atelic and durative ones. One interpretation of this semantic bias is that, initially, children mistake tense marking for aspect marking and map lexical aspect to the relevant morphology. In its extreme form, the bias is attributed to an innate bioprogram (Bickerton, 1981) or some similar "prewiring" of genetic or cognitive sources. The results of a study of Polish children (Weist, Pawlak & Carapella, 2004) do not support this hypothesis. In Polish, tense and aspect are separately marked by morphology and children start to use verbs inflected for past and for future within the same perfective aspect category at about the same age. This demonstrates that, in Polish acquisition, grammatical aspect is not mapped onto tense morphology. It is possible, however, that in the absence of aspectual marking in a language, children may map lexical or inherent aspect onto tense morphology. Hebrew is a language in which aspect is not a grammatical category, and the present study is a replication of the Polish one.

Longitudinal naturalistic observations of 14 Hebrew-speaking children aged 1;6 to 2;3 were searched for the first five verbs each inflected for past, present and future. Past-tense verbs almost inevitably had an achievement aspect, namely, they expressed punctual and telic semantics. Verbs in the present had mostly an atelic and durative aspect, and were mostly activity verbs and statives. This replicates the usual aspectual bias in tense marking. However, the majority of verbs in the future also had an achievement lexical aspect, namely, were punctual and telic, with a minority of activity verbs and others. Comparison of the age at which children produced their first 5 verbs in the three tenses showed that children were less than 2 years old in all three cases, the mean ages were very similar (past: 1;9.12, present: 1;9.16, future: 1;10.22) and *t*-tests showed the ages of emergence were not significantly different. The results do not support a hypothesis by which children mistakenly map inherent lexical aspect to tense morphology. The most likely explanation for the semantic bias of past and present verbs is pragmatic.

P4-34

On the acquisition of Hebrew compositional telicity

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The linguistic importance of telicity is evident from the wealth of theoretical literature on the topic (e.g. Dowty, 1979; Krifka, 1986; Verkuyl, 1993; Tenny, 1994; Rothstein, 2004). The contribution of the current study is in introducing the psycholinguistic prospective to the discussion. We present adult and child data from a study on Hebrew compositional-(a)telicity. We first show that adults unambiguously distinguish telic from atelic predicates, rejecting telic predicates as true descriptions of incompleted events and accepting atelic predicates as descriptions of the same events. These data also reveal that the telicity value of the predicate depends on whether the direct-object NP is mass or count and/or (in)definite. The acquisition data show that even at age 11, TD children are non-adultlike, evincing inconsistent behavioral patterns. Based on independent experiments, testing knowledge of definiteness and the mass/count distinction, we argue that the developmental steps necessary for the acquisition of Hebrew compositional-telicity are 1) knowing definiteness; 2) knowing the mass/count distinction; and 3) knowing how to combine these in order to derive (a)telicity.

We administered a Truth Value Judgment Task (Crain & Thornton, 1998) to 8 Hebrew-speaking adults and 10 TD Hebrew-speaking children, aged 7;9-11;8. Participants were presented with video-clips showing an incompleted event and had to judge whether

the accompanying (a)telic predicate (orally expressed by the experimenter) matched the event or not. There were six experimental-conditions: (in)definite singular count, e.g. 'paint a/the square' (target-judgment for both: 'no'); (in)definite plural, e.g. 'paint (the) squares' (target-judgment for definite: 'no'; target-judgment for indefinite: 'yes'); (in)definite mass, e.g. 'paint (the) cloth' (target-judgments: same as for plural conditions). Each condition contained 5 items and there were16 fillers.

Our results show that adults rarely accept telic predicates as true descriptions of incompleted events (13%), while they virtually always accept atelic predicates as descriptions of the same events (99%). These data also show that both NP-type and definiteness play a crucial role in the derivation of Hebrew compositional-telicity. The results from the children were very different: they often accepted telic predicates as descriptions of incompleted events (40%) and rejected atelic predicates as descriptions of incompleted events (39%). Since no differences were found between age-groups, the child data were collapsed.

In order to investigate whether the children's difficulties were the result of immature knowledge of the mass/count distinction or definiteness, we tested the same children with two independent comprehension experiments: one on the mass/count distinction, and one on definiteness. Results show that while the Hebrew-speaking children's knowledge of definiteness is completely adultlike, their understanding of the mass/count distinction emerges only around age 10 (but cf. Barner & Snedeker, 2005, for the acquisition of mass/count in English).

Based on results from the three experiments, we argue that knowledge of definiteness and the mass/count distinction are both necessary, but not sufficient, conditions for the acquisition of compositional-telicity. Furthermore, the order of acquisition is such that definiteness is acquired first, followed by the mass/count distinction, and only once these are both adultlike, can the child begin to combine them to derive compositional-telicity.

P4-35

Modality of the involuntary state construction in Serbian: Language change and language acquisition

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Most languages express modal meanings using lexical or grammatical morphemes, such as (i) individual suffixes, clitics and particles, (ii) inflectional morphology and (iii) modal verbs (Palmer 2001). However, modality of the involuntary state construction in Serbian (1) is not associated with any one particular lexical or grammatical morpheme in its structure and therefore seems entirely unmotivated. Specifically, the involuntary state construction requires an eventive verb that selects for an agent, and yet (a) shows properties of a non-agentive predicate, and (b) denotes a modal necessity to do V-ing, rather than the actual V-ing. This necessity arises internally to the dative-marked participant, which is obligatorily human.

(1)	Marku	se	jedu	slatkisi.
	Mark.DAT	SE	IMPERF.eat.PRS.3.PL	candies.NOM.PL
	'Mark has a craving for candies.'			

Acquisition studies show that the root modal meanings (such as ability, need, permission and obligation) are crosslinguistically acquired by 3;3 regardless of the typological differences in the modality expressions (Shatz and Wilxoc 1991; Wells 1985; Stephany 1986; Deen and Hyams 2006; Boland 2006). The modal necessity meaning of the involuntary state construction should therefore be conceptually available to all children older than 3;3. However, comprehension data obtained in Stojanovic (2004) show that even at age 3;9 children incorrectly interpret the involuntary state construction as a realized, ongoing event 63% of the time. These results are explained in terms of a possible general cognitive deficit that prevents children from distinguishing modality (i.e. *irrealis*) expressions from realized (i.e. *realis*) events.

In contrast, this study provides experimental evidence for a full competence of this construction at age 3;10 using truth-value judgment task (Experiment 1.), and grammaticality judgment task (Experiment 2.). In Experiment 1., children (n=10, mean=3;10) correctly judged the involuntary state construction as an appropriate description of an obligatory context 90% (27/30) of the time. The obligatory context was presented as a narrative and clearly stated two main components of the meaning of the involuntary state construction: 1) its general modal meaning, i.e. the fact that it denotes an unrealized (i.e. *irrealis*) event, and 2) its specific modal meaning, i.e. need to do V-ing which arises from the factors internal to the dative-marked human participant. In Experiment 2., children (n=8, mean=3;10) correctly identified morphosyntactic elements of the involuntary state construction when contrasted with the corresponding morphosyntactic elements of the active transitive construction (i.e. dative NP vs. nominative NP, presence vs. absence of the clitic *se*, and nominative NP + verb agreement vs. accusative NP + default verb agreement) 100% of the time.

I explain the data in terms of a conceptual, world-knowledge that lies at the bottom of the general modal (*irrealis*) meaning of the involuntary state construction, and also facilitates its acquisition. This world-knowledge concerns the fact that an event with no agent cannot be realized. Some evidence for an early presence of this conceptual knowledge is provided by *Root Infinitives*, which typically occur with eventive verbs, receive modal interpretations, and often omit subjects. (Hoekstra and Hyams 1998).

P4-36

What future to choose?

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University of Toronto

Investigations into the acquisition of tense/aspect have revealed that the future specification (associated or not with modality) is salient at early ages, at least as a semantic notion (Stephany 1985, Smith 1991, Harner 1982). For example, in a study of four Dutch children, whose ages ranged from 2 to 3 year old, Wijnen (1998) has shown that 83% of the utterances containing potential root infinitives receive a future/modal interpretation. The same does not seem to be true about other tenses, if we are to accept Wexler's (1994) conclusion that "the optional infinitive stage will go away once past tense has developed". Such generalizations are also confirmed by Aksu-Koç's (1988) observations on Turkish children. The results of his studies demonstrate that, within the morphological system of this language, the ending (*-sIn*) associated with optative semantics, which indicates desires and intention within the indicative mood, is used by children (1; 11) relatively frequently, while prior to 2; 2 an absence of pure tense contrasts is observed.

In light of these descriptions, the goal of the present study is to examine the acquisition of future (modality) in Romanian; such semantic notion can be expressed in adult speech by three morphological possibilities of the indicative mood, all analytic: a). idiosyncratic forms of the verb *want* in present tense + the infinitive of the lexical verb ('the literary future'), b). Idiosyncratic forms of the auxiliary *have*+ the infinitive of the lexical verb ('the popular future'), c). a periphrastic construction that combines the auxiliary *have* in its indicative present form plus the subjunctive ('the colloquial future'), and conveys intention. Empirical evidence suggests that children prefer the periphrastic form (as it can also be observed on CHILDES). In order to test this hypothesis, six children were examined during the summer of 2007; three of them were native Romanian speakers, being born in Romania, while the other three were born in

Canada from Romanian parents, acquiring Romanian as a first language, but being also exposed to English. Children were aged 2;6-5;10 (the other variables did not seem to influence the results). In order to test both comprehension and production, a test initially performed by Weist et al. (1999) was replicated, and a production section was added; this test contains a sentence-picture matching task; more precisely, the six Romanian children were presented with some pictures that illustrated the distinction *future/non-future*; then, in the comprehension part, the examiner read sentences containing the three future forms in Romanian and asked the children to match the sentences with one of the pictures in the *future*/*non-future* task. Three pairs of sentences were tested, besides the original example (*The boy will catch the fish*/*The boy caught the fish*) in Weist et al. (1999): 1). *The boy will fall asleep*/ *The boy is sleeping*; 2). *The cat will catch the mouse/The cat is catching the mouse/The cat caught the mouse*; 3). *The worker will build the house*/*The worker built the house*/ *The worker is building the house*. These examples were chosen in a such a way as to contain activity, achievement and accomplishment verbs in Romanian. The results showed that all children unambiguously matched the pictures with the sentences containing future (modality). Out of the future forms, children had the most difficulties with the 'popular future'; such results seemed surprising at the beginning, as this form is very frequent in spoken Romanian. But an explanation might be given by the observation that the 'popular future' appears to encode complicated semantics, and is not completely synonymous to the other futures (as traditional grammars imply). Theoretical research performed during the experiment has shown that this type of future expresses evidentiality and incapacity to endorse the information transmitted about a future eventuality, as opposed to simple future possibilities. In the production section of the test, children were given pictures representing future events and were asked to describe them. The results showed that the periphrastic form was the first choice for all children examined. Such a response can be explained by the fact that the 'literary future' is more formal, and therefore, less used in conversations; nevertheless, taking into account the difficulties with the 'popular future', it can also be implied that more complex semantic factors might be involved in this case, possibly related to subtler flavours of modality.

P4-38

Cause, manner, and path of motion across child languages: Evidence from French and English

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Recent research shows wide variations across child languages that raise questions about the role of universal vs. language-specific factors during language acquisition (Bowerman, 1996, 2003, 2006; Bowerman & Choi, 2003; Slobin, 1996, 2003, 2006). In the context of this debate space is a particularly interesting area of study, since it constitutes a most fundamental domain of human cognition, as well as a most variable domain across linguistic systems.

For example, when children talk about motion, their utterances follow the prototypical satellite- vs. verb-framing properties of the adult system (as described by Talmy, 2000) from the earliest age (Bowerman, 1996, 2003, 2006; Choi & Bowerman, 1991; Hickmann, 2003; Hickmann & Hendriks, 2006; Slobin, 1996, 2003, 2006). The present study examines how French vs. English speakers (adults and children from 3 to 10 years) express caused motion in an experimental situation designed to present several types of information difficult to express simultaneously within a single utterance. Stimuli showed a human agent causing (AC) in a particular manner (AM) the displacement of an object that occurred in a particular manner (OM) along a particular path (OP) (a man pushing a ball (AC + AM) that rolled (OM) down a hill (OP)). The analyses examine whether typological properties influence the information speakers express, the ways in which they present the information, and whether response patterns are similar at all ages or change with age.

Adult responses showed clear cross-linguistic differences. English adults systematically used main verb roots to combine Cause with Manner and satellites to express Path (*He rolled the wheel into the garage*). In contrast, French adults distributed Cause, Manner, and Path in all parts of the utterance, using a variety of constructions (*Il monte la bouée en la faisant-rouler* 'He ascends the swimming ring by making it roll', *Il pousse la valise qui descend* 'He pushes the suitcase that goes down'). Responses were also more compact in English (more conflated information within each clause) than in French (information distributed across successive clauses).

From a developmental point of view, children's responses become denser with age, simultaneously expressing more and more information, irrespective of language. However, language differences also occurred. Within each language children's responses from three years on clearly resemble adult responses in their language more than children's responses at the same age across languages. In English children's responses showed the systematic adult distribution. In French they showed a more varied and less compact distribution, with increasing reliance on peripheral subordination. French children also used some idiosyncratic constructions, suggesting some difficulties in learning to combine multiple pieces of information (*Il traverse le cheval* 'He crosses the horse' [instead of *faire traverser* 'make cross']).

These results are in line with previous results concerning space in child language. They show the strong impact of typological properties on how children learn to talk about motion. These differences are striking, despite general spatial dimensions that also affect speakers' responses at all ages, and general cognitive factors that also co-determine children's developmental process. The conclusion highlights the need for models to account for the joint impact of cognitive and linguistic factors on development.

P4-39

Polish late vs. typical and precocious talkers at 24 months: Follow ups at 30 and 42 months

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The poster presents some partial results of an on-going large-scale project carried out in Poland. During a screening performed on 446 two-year-olds, using a Polish version of MacArthur-Bates toddler CDI, a group of 49 late talkers (LT) was identified, based on a low (<10th percentile) active vocabulary score.

Two control groups were established. One group, called typical talkers (TT) consisted of 49 children who scored within 24th to 79th percentile range. The other group included 39 precocious talkers (PT) whose vocabulary score > 85th percentile. The three groups were matched for gender as closely as possible. They did not differ in either the socioeconomic status of the family, nor in the children's non-verbal IQ measured with Leiter's Scale.

The children have been seen twice, at 30 and 42 months. On occasions the child, accompanied by his/her parent was recorded during a play session. All the children were also asked to perform a number of language tasks.

Language-related tasks applied at 30 months involved among other things: a passive and active vocabulary check and Lowe and Costello's Test of Symbolic Play.

At 42 months sentence comprehension was tested with some items from Bishop's TROG2, a short production test was used, as well as a sentence repetition and a non-word repetition tasks. 15-minute-long speech samples were transcribed and evaluated.

The results show that the LT group at both data points significantly differed from each of the control groups in almost all measures, the only exception being the level of symbolic play, which showed no difference. Active vocabulary at 30 months showed very sharp differences. Results obtained by the LT group in all the language tests administered at 42 months were significantly lower. The analysis

of samples of spontaneous speech confirmed this result. Within LT group 8 children obtained very high results at 42 months, which means they were probably late bloomers.

Surprisingly, no significant differences were found between Typical Talkers (TT) and Precocious Talkers (PT). Since the screening was based on a parental inventory this result does not necessarily mean that an unusually large vocabulary at 2 does not result in better than average language skills in further development. Maybe the parents giving their children so much credit at 2 are simply showing wishful thinking?

P4-40

Premature birth and language development: A longitudinal study of predictive lexical indices

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Substantial evidence indicates that prematurely born children have more problems in cognitive and social-affective areas than do their normal birth-weight counterparts (see Aylward, 2005 for a review). However, due to contradictory findings across studies, developmental outcomes regarding language development are far from certain.

The major goal of the present study was to investigate differences between a group of premature- and a group of full-term infants, in particular, if utterance-length at 24 and 30 months was predictive of subsequent language development at the end of the third year. A secondary focus of this study was to evaluate the stability of the language development measures between 24, 30 and 36 months of age. Furthermore, the relation between cognitive development and language development was investigated.

The sample consisted of 36 mother-infant dyads: 18 healthy full-term infants and 18 premature (inclusion criteria of the latter being a birth weight between 750 and 1600 gr).

Child language abilities were assessed in 3 ways evaluating: 1) utterance length through video-recorded mother-child interaction sessions at home, during everyday activities, such as eating and playing, at 24, 30 and 36 months of age; 2) vocabulary size by means of the Mac Arthur Communicative Development Inventory (Fenson et al., 1993), assessed at 24 and 30 months of age; 3) receptive vocabulary with the Peabody Vocabulary Test (Dunn & Dunn, 1997) evaluated at 14 and 36 months of age. Moreover, cognitive development was measured with Bayley's Scales at 14 and 36 months.

A main effect of prematurity on all language measures at 24, 30 and 36 months was found and these measures correlated significantly with subsequent language development. Utterance length was not found to be stable throughout the different ages. Further results and their discussion shall be presented in the poster.

P4-41

An intervention for children with language delay based on the direct contrast hypothesis

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We describe an intervention for children with significant language delay based on a theory of corrective input developed in the domain of first language acquisition.

The Direct Contrast hypothesis predicts that the discourse context within which grammatical forms are modelled can affect the child's acquisition of information about grammaticality (Saxton, 1997). In particular, it is predicted that adult forms which are modelled directly contingent on child grammatical errors can function as negative evidence, as exemplified in the following examples:

(1) Child: He's got LITTLE NICE feet.
Adult: Oh, he has got NICE LITTLE feet.
(2) Child: All by HER OWN.
Adult: All by HERSELF?

N.B. Capitals highlight direct contrasts between child error and correct adult alternative; they do not indicate pronunciation stress.

Support for the Direct Contrast hypothesis is forthcoming from a number of typical language studies (both observational and experimental) examining both immediate and longer-term effects of corrective input (for a summary, see Saxton et al., 2005).

We implemented an intervention based on the Direct Contrast hypothesis for 30 children (21 boys), mean age 56 months (SD 9 months; range 36-72 months). These children meet the standard criteria for Specific Language Impairment: receptive and productive language at least 1.5 SDs below the mean (CELF); non-verbal IQ within the normal range (BAS); normal articulation (Goldman-Fristoe); and no pragmatic difficulties (CCC II).

The intervention was targeted at three aspects of morphosyntax: (1) articles; (2) copula: and (3) auxiliary verbs. Pre-intervention language samples confirmed that our participants experienced significant difficulties with these specific targets. Children received a maximum of 10 hours of intervention spread over a six week period, comprising 20-minute sessions daily. A mean of 8.33 hours of intervention was supplied (range 4.33-10 hours). Children were exposed to the target structures in one-to-one intervention sessions based on conversation about toys, games, books and other play-like activities. To test the importance of discourse context in modelling grammatical forms, we supplied the target structures in both contrastive discourse settings and via non-contrastive modelling, via within-subject comparisons.

We report the effects of this intervention for both productive and receptive language. Productive language ability was gauged from language samples taken pre-, mid-, immediately post and 6-months-post intervention. Receptive language was assessed via a grammaticality judgement task, implemented pre-, mid- and immediately post-intervention. We compare our findings with previous interventions based on *recasts*, a category of adult response that differs from direct contrasts (e.g., Proctor-Williams et al., 2001). We also consider more broadly the relevance of theories of typical first language acquisition in the remediation of language delay.

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P4-42

Early identification and intervention to prevent reading difficulties: A predicitive longitudinal study on French speakers at kindergarten

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When children arrive in school, they already vary widely in their early literacy experiences i.e. reading-related skills and knowledge. What can be done at school to reduce the number of children having difficulties in learning to read, especially those considered at risk for academic underachivement, such as those who live in poverty?

This research seeks to identify reliable early predictors of reading in children from low-income families and test the effectiveness of different phonological awareness training programs.

The first objective of the present study is to closely examine the relation of cognitive and linguistic abilities in kindergarten and the later reading acquisition in first grade. From a sample of 396 five-year old children, 148 were selected and matched for age, IQ and vocabulary. They were tested 3 times: at 5 and 5.6 years old (beginning and end of kindergarten) and at 6.6 years old (end of first grade) on a variety of cognitive and linguistic tasks and on reading measures. Cognitive abilities were assessed using memory, attention, inhibition, IQ and visuo-spatial standardized tests. Linguistic abilities were assessed by syllabic, rhymic and phonemic awareness, rapid naming, vocabulary and oral comprehension tasks. Reading was assessed by words and non-words identification, spelling and comprehension tasks.

The second objective of this study is to evaluate the direct and indirect effets of 3 different metaphonological trainings on all these measures. Children were divided into 4 groups: one served as a control group and the three others were experimental. In each condition, programs were conducted during the school time, by trained teachers during their regular classes. The first training program was an ordinary grapho-phonological, code-focused training, the second one was a phonological program focused on metacognitive strategies, and the third one was a phonological training focused on sequential or simultaneaous processing. These programs were conducted over a period of 12 weeks. The children were assigned in small groups, and each group was provided with one or two 20-minutes sessions a week, so that 5 to 8 hours of training were accomplished. In each class, pre and post training data were collected by experimenters.

Results revealed that, unlike previously believed, it was not the phonological measures but the cognitive ones; like verbal short term memory and visual detection tasks, that positively and significantly predict emerging literacy (reading and spelling) after controling for age, socio-economic backgroud and gender. For the second objective, one training group outperformed on the phonological awareness measures, alphabetic tasks (reading and spelling), word-identification and comprehension. One year later, these differences between the groups remained but were less impressive.

Within this presentation, we will focus on the predictors of reading in french children and discuss the modalities of early intervention in low income family children at risk for cognitive delays and reading difficulties. We shall also examine the benefits of preparing formal instruction in first grade.

P4-43

Summarizing expository texts

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Research has shown that explicitly teaching students expository text structure improves their comprehension of expository texts, yet little developmental data is available on students' comprehension and production of expository text structures. This poster presents the analysis protocols and results of a classroom-implemented intervention for 4th and 5th grade students designed to teach comprehension of cause-effect and compare-contrast texts. Ten 4th and ten 5th grade teachers and their students participated in this project along with a comparable number of control teachers and students. Reliable and valid assessments were created that replicated authentic curricular task demands. In the assessment, students identified the compare-contrast or cause-effect text structure of expository texts, filled in a cloze graphic representation, and wrote a summary of the paragraph from their representation. Student summaries were evaluated at the microstructure level using CLAN (mean length of T-units, number and type of connectives and dependent clauses) and at the holistic macrostructure level using a rubric based on number and integration of elements of working memory used in the summary. The developmental patterns of micro- and macrostructures of students' written cause-effect and compare-contrast summaries will be shown and explained. There is an interaction of syntactic microstructures with organizational macrostuctures in which students clearly identify the relationships between propositions in the texts and the relationship of the propositions to the overall theme of the texts. Awareness of developmental micro- and macrostructure patterns provides educators with guidelines regarding the specific content of instruction needed by students. At the end of the instruction period, more treatment students than controls made greater than 1-year-equivalency growth. Repeated measures ANOVAs indicated that the children in the treatment classroom condition performed significantly better than the children in the control on Gates' comprehension measures ($F = 29.63$ and $p < .001$). Teachers who were high implementers of the strategies had more children who made greater than one-year performance gain than control teachers or teachers who were low implementers. Students in the bottom quartile performed above their pre-instruction percentile rank on Gates' comprehension measure.

P4-44

Investigating the prerequisites to the acquisition of full meaning in the preschool years

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Recently, the studies focusing on language development, consider vocabulary in terms of "breadth" and "depth". To date this has typically only been done for established lexical items. The present study highlights the importance of examining the "breadth" and "depth" of vocabulary in acquisition too, taking into account the child's abilities, as well as contextual factors.The aim of the present study was to specify the necessary prerequisities to the acquisition of full meaning in order to better understand the acquisition process both in "breadth" and "depth". Particularly, the present research considers a) children's existing vocabulary, b) the impact of different sources of information and c) word's frequency and semantic domain, on the longitudinal acquisition of the new terms. One hundred and thirty children (5.00 – 6.00) were randomly assigned to five groups (Control, Repetition, Ostensive definition, Lexical contrast, Definition). Each intervention group was introduced to four target words through a series of controlled linguistic contexts over a period of four weeks. Immediately after each introduction, children's word knowledge was investigated in seven lexical tasks (naming, multiple

choice, sorting, short questions, relations, definition, story generation) aimed to provide a measure of "depth" of word knowlwdge. Examination of the children's lexical representation took place over three consecutive periods.

Group intervention, the existing vocabulary, and the nature of the word diffrentially influenced performance across tasks. There were subtle effects over time of the differing linguisitc contexts. The data demonstrated that comprehension of the new words was not associated with word production. Partially represented words were acquired more easily over time than unknown words. That was the case for production but not for comprehension where the level of representation did not play any role on task performance. Furthermore, word production was found to be associated with the semantic domain to which the new words belonged. Finally, children's existing vocabulary was significantly correlated with success in the naming and multiple choice task.

The present study has theoretical, educational and methodological implications. Theoretically, these data support recent claims to consider both the "depth" and "breadth" of vocabulary knowledge (Quellette, 2007).

The findings have relevance for intervention programmes designed to foster language development and for our understanding of the links between oral vocabulary knowledge and literacy development.

P4-45

Enhancing language and communication in secondary school children with Language Impairment (LI) through two intervention programmes: Narrative and vocabulary enrichment

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Background: Research into language development and disorders has routinely focused on early preschool and primary development. However it is accepted that language development continues to develop in complexity and abstractness throughout the adolescent period [1]. During adolescence, the individual goes through fundamental changes in cognitive, social and educational development [2]. These changes significantly challenge the individuals' use of language to meet the demands of their educational and social context. Clinical research on language impairments (LI) in this population is also lacking and this reflects the shortage of speech and language therapy (SLT) provision with this population [3]. However, a significant number of secondary school students have language and communication impairments, which impede access to the curriculum and have a long-term influence on language, educational and psychosocial functioning in adolescence and adulthood [4]. The long term nature of LI and the rigorous demands of secondary school justify increasing SLT provision in this context. However, limited resources and lack of evidence for the effectiveness of therapy with this group, makes this difficult. There is a growing need to identify evidence-based SLT services delivered in the education context in this client group.

Aim: This research addresses this gap in service provision and investigates the effectiveness of two SLT programmes (narrative and vocabulary enrichment) in improving language and communication in secondary school-aged students with LI (11-13 years). The study investigates the effectiveness of each therapy and their combination and examines which specific aspects of language are improved.

Method: The study employs outcome measures from the child, school and parent perspective, assessing cognitive and language performance at baseline, pre-treatment and post-treatment points. The interventions are pedagogically sound in targeting key skills of the curriculum: storytelling and vocabulary. The therapy is delivered by teaching assistants under the supervision of speech and language therapists thereby using a collaboration of school staff and therapists. There are four treatment groups (N = 40) each receiving 18 therapy sessions over a 6-week period: a narrative group, a vocabulary group, a group getting both treatments and a delayed treatment group which act as a control group.

Discussion: The poster will detail the content of each treatment programme. The differential effects for each treatment group on specific measures of storytelling and vocabulary, as well as the generalisation of knowledge on broader standardised language assessments and educational performance will be outlined. Methodological and procedural issues around training school staff and conducting intervention studies through teaching staff in secondary schools will be discussed; and implications for future intervention studies with this older client group will be explored.

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Word-finding intervention for children with Specific Language Impairment: Utility of phonological and semantic clues

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Word-finding difficulty is a common feature in children with specific language impairment. This language disorder corresponds to the inability to find the right words despite of word knowledge: speaker knows the word s/he wants to use but is sporadically unable to retrieve it. Such difficulties occur in both the spontaneous discourse and in naming tasks, often affecting negatively children's oral communication and academic learning. Adequate and effective intervention is then essential. Therapeutic studies with children presenting this kind of deficit have proved the efficiency of both semantic and phonological techniques to improve lexical access. Nevertheless, the majority of these investigations were led on groups without taking into account specificities of each child. However, gains with such a therapy could be different for each child because of a different profile in the access deficit. Therefore, it is not clear that this mixed intervention is the unique solution to help children presenting word-finding difficulties. A more specific intervention should be also adequate.

To investigate more precisely the effects of phonological and semantic strategies for helping children presenting a specific language impairment with word-finding difficulties associated, this study took the form of phonological and semantic training. The specificity of this study is that different items are trained with phonological and with semantic clues in order to try to evaluate their effects separately. The techniques used strengthened the child's phonological awareness and semantic network (categorization, association task, definitions, etc). The treatment was organized according to a single-subject design with each child acting under his/her own control. Baselines were proposed to evaluate the efficiency of the therapy. Seventy-two pictures were used: 24 for phonological training, 24 for semantic training and 24 as control items to observe an eventual generalization. Six 30-minutes sessions were given. A pre and post naming test allow to check general gain in lexical access.

Results indicated improvement in word-finding (reduction in naming errors and time latency) and in tasks proposed during the training. Gains were observed on the treated words after the individual therapy but not on untrained words. The treatment of the word-finding difficulties is therefore linked to the explicit application of a strategy on trained words. Improvements are nevertheless specific to each child. In one hand, the gain size is different for each subject. In the other hand, some children show progress in some tasks but not in other, suggesting one kind of training is more appropriate for them. The contribution of the intervention sessions toward facilitating word-finding strategies of the four children is discussed.

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What quantity tells us about quality: Evidence from clinical interactions with LI Hebrew speaking children

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The development of inflectional morphology in children with language impairments (LI) is consistently different from that of younger, typically developing children. To facilitate its acquisition, intervention programs are designed where the social, physical and linguistic contexts are manipulated to create frequent and diverse opportunities for elicitation of grammatical targets. The present study examines whether intervention goals are indeed achieved, using verb-morphology as a test-case.

The present study uses cross-sectional samples of naturalistic data collected during clinical interactions between 12 Hebrew-speaking children with LI (6 boys and 6 girls) and their clinicians (all were female). The children's ages ranged between 2;6 – 3;5 (six children) and 5;4 - 6;10 (six children). The interactions of the younger children and half of the older children were video-taped and the rest – audio-recorded during full therapy sessions (30 – 50 minutes). Each session included various elicitation activities - conversation, symbolic and free play, board games and book reading. The recordings were transcribed, coded and analyzed using CHILDES with adaptations to Hebrew. The Mean number of utterances per transcript was 660 (child and clinician combined). All verb-containing utterances produced by the children and the clinicians were isolated, and all lexical verbs (N = 8517, rather evenly distributed between the two groups of children) were lexically coded for root and verb-pattern, morphologically coded for number, gender, person and tense, and syntactically coded for sentence structure.

The data reveal that: 1. Overall, the clinicians produced around 75% (N = 6540) of all verb-tokens in the analyzed interactions whereas the children (younger and older) produced around 25% (N = 1977); 2. Verbs in the singular were used considerably more than verbs in the plural (clinicians 80%, children 65%). 3. Unlike the clinicians who used most verbs in the 2nd person (over 30%), the children used most verbs in the 3rd person (over 30%); 4. The clinicians used most verbs in the feminine (60%) whereas the children used most verbs in the masculine (60%); 5. Most of the clinicians' and the children's verbs were in the present tense (clinicians 37%, children 48% of the total respective verb-tokens); 6. Of the present tense verbs, the most frequently used form was the 3rd person singular masculine form (clinicians: N = 569, 23%; children: N= 278, 30%); 7. Most occurrences of this verb form were with *roce/a* 'want', *ose/a* 'make/do' and *yoda'at* 'know-fem'; 8. The clinicians used 'make/do' most frequently with *ma X osa?* 'what's X doing?' and the children with 'X does Y'. A similar invariant pattern was found for the uses of 'want' and 'know'.

In sum, the clinicians and the children show little diversity in the use of verb-morphology and in the choice of lexical verbs and verbal constructions during intervention despite the variety of elicitation activities. These findings emphasize the importance of critical on-going assessment of intervention strategies using computerized quantitative methods (e.g., CHILDES).

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Promoting narrative competence among low-income preschool children

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Young children's narrative skills are increasingly recognized as an important component of the early acquisition of literacy and later school success. For example, preschoolers' storytelling abilities predict their later reading abilities (Dickinson & Tabors, 2001; Griffin, Hemphill, Camp, & Wolf, 2004; Wells, 1985). However, research on factors that promote early narrative skills is surprisingly thin. Even research on the benefits of bookreading interactions between preschoolers and their caregivers (or teachers) focuses primarily on promoting children's vocabulary skills and rarely their narrative abilities. Studies on promoting narrative comprehension usually focus on school-age children (e.g., Goldman, Graesser, & van den Broek, 1999; Paris & Paris, 2007). However, promoting early narrative skills is of critical importance; this is especially true for low-income preschoolers, many of whom enter school with weaknesses in narrative and other decontextualized language skills.

This study examined whether we can promote children's narrative abilities in preschool classrooms by utilizing resources already present there: that is, using a regular storytelling and story-acting activity in which children freely compose stories, dictate them to the teacher, and then later act them out, together with peers, for the entire class. Children thus participate in three mutually supportive and interrelated roles--as tellers, actors, and audience.

Method: Four experimental and four control child care classrooms serving low-income children participated, yielding 70 3- to 4-year-olds present during the entire school year. The storytelling and story-acting activity was introduced in the experimental classrooms at the beginning of the year (October) and took place twice per week. Pretests and posttests were given to all the children in September and May, respectively, as well as a second posttest in July, two months after the intervention was completed. A comprehension and production narrative task was included in every testing phase. For this analysis, we focus on the comprehension questions that followed the telling of a story in three different conditions: (1) using no prompt (oral telling); (2) using 4 pictures that create a sequence (picture sequence); and (3) using only one picture with implied action (single picture). Our comprehension questions tapped pure factual memory (character's name) and story components (orientation, problem, resolution, and outcome).

Results and discussion: Overall, results differed among the three tasks. Children displayed the weakest narrative comprehension abilities with the single picture technique, while oral telling and picture sequence results were stronger. Children's abilities improved generally with age and from fall to spring. In accord with our hypothesis, the story comprehension abilities of children in the experimental classrooms improved more than those of children in the control classrooms for all story tasks, though this difference was significant only for the single picture condition. Retesting two months after the intervention was completed indicated a further increase

in comprehension abilities on the oral telling task for experimental but not control children. Overall, these results suggest that preschoolers' narrative abilities can be improved by this simple but powerful classroom activity that effectively combines children's eagerness to tell and listen to stories with their enthusiasm for play, friendship, and group life.

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