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CENTRE FOR
LANGUAGE SCIENCES



Harvard-Australia Workshop on: Language, Learning and Logic

Program, Information and Abstracts

**22nd – 26th August 2011
Macquarie Graduate School of Management
Macquarie University, Sydney**

**The Harvard-Australia Workshop on:
Language, Learning and Logic**

Organising Committee:

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The Harvard-Australia Workshop on Language, Learning and Logic

Welcome to the Harvard-Australia Workshop on Language, Learning and Logic, sponsored by Macquarie University's Centre for Language Sciences (CLaS) and ARC Centre of Excellence in Cognition and its Disorders (CCD), and the Harvard University Australian Studies Committee. The workshop takes place from the 22nd-26th August, 2011, in the Caltex Lecture Theatre in Macquarie University's Graduate School of Management.

The workshop's topic is the relationship between language, learning and logic. The workshop addresses basic scientific questions about the acquisition of language and meaning, such as:

- how do children learn language; specifically, how do they learn to associate meanings with words, phrases and sentences?
- do children learning different languages associate sentences with meanings in the same or in different ways?
- can a computer learn a language by following the same steps that children use to learn a language?

While this workshop focuses on basic science, the kinds of research presented at this workshop may ultimately help us to devise better ways of treating a variety of language disorders, and lead to improvements in human-computer interaction, such as computers that can understand and use human language in a more natural way.

The workshop addresses the topic of Language, Learning and Logic from a very interdisciplinary perspective. Our speakers include linguists, philosophers, computer scientists, psychologists and cognitive scientists from around the world. Besides researchers from Harvard, we also have invited speakers from a number of the top North American, European and Australasian universities.

This workshop is a wonderful opportunity for our Ph.D. students, who will be able to take advantage of the presence of leading researchers to learn about cutting edge developments in the field. As well as attending the workshop talks, we encourage you all to visit the poster sessions that will be taking place after the lunch breaks to get an idea of the breadth and the depth of research on Language, Learning and Logic that students and Early Career Researchers from Macquarie University and elsewhere are conducting.

It's appropriate that Macquarie University should host this workshop on "Language, Learning and Logic", as Language and Learning are major research themes across Faculties here at Macquarie University. We have a whole-head magnetoencephalography (MEG) system for studying cognitive processing in children (the first in the world, which the invited speakers will be visiting on Wednesday), and we're building a new "Hearing Hub" building to house the Macquarie researchers in the CCD, including many members of CLaS.

We'd like to thank all of the people that helped make this workshop a success, including the office of the Macquarie University Deputy Vice-Chancellor for Research for their financial support. We'd like to especially thank our colleagues from Harvard that were involved in the organisation of this workshop specifically Professor Gennaro Chierchia and Professor C.-T. James Huang -- for their intellectual and administrative support, and the Harvard University Australian Studies Committee for their generous financial support. Finally, we'd like to thank all of the participants, especially those from overseas, for travelling to Macquarie University and sharing their ideas and expertise.

Mark Johnson, Stephen Crain, Drew Khlentzos, Local Organising Committee

Program

Day 1 – Monday, 22nd August

	0900-1000	Registration Tea/Coffee on Arrival	
Session 1 <i>Chair:</i> <i>Rosalind Thornton</i>	1000-1030	Welcome, Introduction and Acknowledgement of Country Opening Address	Mark Johnson Macquarie University Jim Piper Deputy Vice-Chancellor (Research)
	1030-1130	<i>All languages are not the same</i>	Stephen Crain Macquarie University
	1130-1200	Morning Tea	
Session 2 <i>Chair:</i> <i>Rosalind Thornton</i>	1200-1300	<i>On the meaning of free relative clauses and plural definite descriptions: Evidence from acquisition</i>	Ivano Caponigro University of California, San Diego
	1300-1400	Lunch	
Session 3 <i>Chair:</i> <i>Ed Stabler</i>	1400-1500	<i>Variations in passivization: analyses and consequences</i>	James Huang Harvard University
	1500-1600	<i>Relative clauses in first language acquisition and in children with dyslexia</i>	Teresa Guasti University of Milan-Bicocca
	1600-1630	Afternoon Tea	
Session 4 <i>Chair:</i> <i>Ed Stabler</i>	1630-1730	<i>Cognizing Language: I-Meanings and Semantic Competence</i>	Terje Lohndal University of Maryland
	1730	Close	

Day 2 – Tuesday, 23rd August

	0900-0930	Tea/Coffee on Arrival	
Session 1 Chair: <i>Drew Khlentzos</i>	0930-1030	<i>Most Counterfactuals are False</i>	Alan Hájek The Australian National University
	1030-1130	<i>Semantics and Ontology</i>	Max Cresswell Victoria University of Wellington
	1130-1200	Morning Tea	
Session 2 Chair: <i>Drew Khlentzos</i>	1200-1300	<i>Epistemic Comparativism: A Contextualist Semantics for Knowledge Ascriptions</i>	Jonathan Schaffer The Australian National University
	1300-1400	Lunch	
Session 3 Chair: <i>Mark Steedman</i>	1400-1500	<i>Are There Different Kinds of Uncertainty?</i>	Mike Smithson The Australian National University
	1500-1600	Poster Session 1 and Afternoon Tea	
Session 4 Chair: <i>Mark Steedman</i>	1600-1700	<i>Thought Experiments</i>	Frank Jackson Princeton University and The Australian National University
	1700	Close	

Day 3 – Wednesday, 24th August

	1000-1200	MEG Tour (Invited Speakers)	
	1200	Free Time	

Day 4 – Thursday, 25th August

	0900-0930	Tea/Coffee on Arrival	
Session 1 Chair: Katherine Demuth	0930-1030	<i>Guessing Rule 1: towards a 'Modest UG'</i>	Avery Andrews The Australian National University
	1030-1130	<i>Acquiring Sentential Negation in Child English</i>	Rosalind Thornton Macquarie University
	1130-1200	Morning Tea	
Session 2 Chair: Katherine Demuth	1200-1300	<i>Cascading water, implicit naming and scalar implicature: experimental pragmatics in the post-modular era</i>	Jesse Snedeker Harvard University
	1300-1400	Lunch	
Session 3 Chair: Avery Andrews	1400-1500	<i>Phonological Constraints on the Acquisition of Grammatical Morphemes</i>	Katherine Demuth Macquarie University
	1500-1600	Poster Session 2 and Afternoon Tea	
Session 4 Chair: Avery Andrews	1600-1700	<i>Synergies in Language Acquisition</i>	Mark Johnson Macquarie University
	1700	Close	

Day 5 – Friday, 26th August

	0900-0930	Tea/Coffee on Arrival	
Session 1 Chair: Michael Frank	0930-1030	<i>Integrated, predictive language models</i>	Edward Stabler University of California, Los Angeles
	1030-1130	<i>What's so great about compositionality?</i>	Stuart Shieber Harvard University
	1130-1200	Morning Tea	
Session 2 Chair: Michael Frank	1200-1300	<i>Language acquisition, representation, and use: What can we learn from computational and experimental evidence?</i>	Amy Perfors University of Adelaide
	1300-1400	Lunch	
Session 3 Chair: Amy Perfors	1400-1500	<i>Early word learning through communicative inference</i>	Michael Frank Stanford University
	1500-1600	<i>The Statistical Problem of Language Acquisition</i>	Mark Steedman University of Edinburgh
	1600-1630	Afternoon Tea	
Session 4 Chair: Amy Perfors	1630-1730	<i>Semantic Satisficing and the Core Semantic Properties of Conditionals</i>	Drew Khlentzos University of New England
	1730	Close	

Invited Speaker Abstracts (In order of presentation)

All languages are not the same

Stephen Crain
Macquarie University

Across languages negation assumes different scope relations when it combines with words for disjunction and when it combines with words for conjunction. Pursuing a suggestion by Szabolcsi (2002), and extending a proposal by Goro (2007), this cross-linguistic variation is attributed to two scope parameters.

One is the Conjunction Parameter. In some languages conjunction is a positive polarity item (PPI) and takes scope over negation at the level of logical form (AND = +PPI). In Japanese and Mandarin, conjunction has the value AND = +PPI, so negated conjunctions are interpreted as meaning 'both not' (*neither*). Conversely, English takes the AND = -PPI value of the parameter, so negated conjunctions generate a 'not both' reading.

Second is the Disjunction Parameter. In some languages disjunction is a positive polarity item (PPI) and takes scope over negation (OR = +PPI). In other languages, including Korean and English, negation has scope over disjunction (OR = -PPI). In languages that favour the value OR = -PPI, negated disjunctions generate a conjunctive entailment, as in one of de Morgan's laws: $\sim(A \vee B) \Rightarrow \sim A \wedge \sim B$. In languages that assign the OR = +PPI value, such as Japanese and Mandarin, negated disjunctions do not generate a conjunctive entailment.

These cross-linguistic differences lead to specific predictions about the course of language development. Adopting the Semantic Subset Principle, we predict that children will initially favor the value of a scope parameter that makes sentences true in the narrowest range of circumstances. This ensures that children will have access to positive evidence if the local language favours the alternative value, one that makes sentences true in a broader range of circumstances. The subset value for negated conjunctions is AND = +PPI, so children acquiring English are predicted to interpret negated conjunctions as in Japanese and Mandarin. Just the opposite pattern is expected for negated disjunctions. In this case the subset value is OR = -PPI, so children acquiring Japanese and Mandarin are predicted to interpret negated disjunctions as in English.

We have studied children's understanding of negated conjunctions and negated disjunctions in English, Japanese and in Mandarin. As predicted, children initially favour the subset parameter values of logical connectives, even when these values conflict with the values assigned by adult speakers of the local language. For example English-speaking children initially favour the AND = +PPI value of the Conjunction Parameter, as in Japanese and Mandarin. And Japanese- and Mandarin-speaking children initially favour the OR = -PPI value of the Disjunction Parameter, as in English and Korean. The findings confirm the predictions of the Semantic Subset Principle and support the Continuity Hypothesis, which maintains that child language can differ from the local adult language just in ways that adult languages can differ from each other. The findings pose a challenge for usage-based account of language development, since child language differs from that of adults in systematic ways, rather than being less refined.

On the meaning of free relative clauses and plural definite descriptions:

Evidence from acquisition

Ivano Caponigro
University of California, San Diego

Plural definite descriptions (e.g., "the things on the plate") and free relative clauses (e.g., "what is on the plate") have been argued to share the same semantic properties (i.e., they both refer to the maximal element of a given set), despite their syntactic differences. We provide experimental support for this semantic analysis with the first reported simultaneous investigation of children's interpretation of both constructions (with a Truth-Value Judgment task, an Act-Out task, and a corpus study) and highlight how experimental methods can inform semantic theory.

Variations in passivization: analyses and consequences

C.-T. James Huang
Harvard University

Cross-linguistically, there are two major strategies to produce passive sentences. One produces passives by an operation that de-transitivizes (rather, unaccusativizes) the main verb, and the other does so by superimposing a de-causativized causative verb on a clause that may itself be active. The first, 'canonical' strategy is exemplified by the English *be* passive, and the second, 'non-canonical' strategy is exemplified by the Mandarin *bei* passive. The English *get*-passive involves a combination of both strategies, with a de-causativized *get* superimposed on a passivized verb. My talk will address three somewhat related aspects of the non-canonical passives, concerning their syntactic analyses and questions of variation, acquisition, and change.

I shall revisit the question of whether *get*- and *bei*-passives should be analyzed in terms of control or raising, concluding that both strategies are available. Using examples from Chinese I show that verbs differ in the 'bandwidths' along the spectrum of meaning from the causative to the pure unaccusative, both internally and cross-linguistically, giving rise to the possibility of dual (control or raising) analyses with some verbs in one language/dialect or another. Finally I discuss a new form of non-canonical *bei* passive that has emerged in Mainland China, particularly in satirical writings on the web, exemplified by *bei lüyou*, *bei shizong* literally 'be traveled, be disappeared'. I address questions of acquisition and change that arise from the analyses entertained.

Relative clauses in first language acquisition and in children with dyslexia

Maria Teresa Guasti
University of Milan-Bicocca

In collaboration with
(Carlo Cecchetto, Caterina Donati, Fabrizio Arosio, Chiara Branchini
and Mirta Vernice)

The acquisition of restrictive relative clauses (RCs) has been investigated at least since the seventies, with periods of renewal of interest and of shifting of focus on various aspects of the structure (see Guasti, 2002 for review). A very influential work by Hamburger & Crain (1982) established that 4-year-old American-speaking children can produce RCs when the experimental setting is pragmatically appropriate. Since then, it was shown that children speaking a varieties of languages produce a range of RCs spontaneously (Diessel & Tomasello, 2000 for German) or through elicitation (Crain, McKee & Emiliani, 1990 for Italian; Diessel & Tomasello, 2005 for German; Guasti & Cardinaletti, 2003 for Italian and French; Labelle, 1990; McKee, MacDaniel & Snedeker, 1998, for English, a.o.).

While it is certainly true that children produce RCs from early on, it is not the case that they master all aspects of relativization. Recently, a shift of attention has generated the result that, across a wide variety of languages, children are more accurate on subject than on object RCs both in comprehension and in production (Adani, 2009; Adani, van der Lely, Forgiarini & Guasti, 2010; Arosio, Adani & Guasti, 2009; Arosio, Guasti & Stucchi, 2010; Belletti & Contemori, 2010; for Italian; Arnon, 2005; Friedmann & Novogodsky, 2004; Friedemann, Belletti & Rizzi, 2009 for Hebrew; Costa & Friedemann, 2010 for European Portuguese; Arosio, Yatsushiro, Guasti, 2011 for German; Guasti, Stavrakaki, Arosio, 2008 for Greek). However, this asymmetry does not hold true for all types of object RCs. Friedemann, Belletti & Rizzi (2010) show that it holds when object RCs include a nominal head and full DP subject, but not when the head is a *wh*-element or the subject is null. Friedemann et al.'s proposal for this pattern is an elaboration of Grillo (2009) and builds on insights from linguistic theory and psycholinguistic theorizing. Under a raising analysis of relative clauses (Kayne, 1994), both subject and object RCs feature a *A'*-dependency between two positions: the position hosting the relative head, the antecedent, and the position from where this head come from, the gap. They differ in that in object, but not in subject relatives, there is an intervening element between the antecedent and the gap (the embedded subject). Intervention of an element in an *A'*-dependency may disrupt children's performance, depending on its featural content with respect to the relative head. In this approach, intervention is disrupting children's comprehension and production whenever the antecedent and the intervener are featurally similar, i.e., they are both lexically restricted or have a nominal part, as this yields a RM violation.

While we retain the fundamental idea that intervention is at stake in children's production and comprehension of object RCs, we propose a different approach, which is based on Cecchetto and Donati's (2010) theory of

relative clauses, which is a version of the raising analysis theory. The essential idea of this approach is that the external D in a RC triggers selection of the relative N head via selection, as illustrated in (1) and yields the result in (2). Thus, movement of the head of the RC is a selection driven movement.

- (1) { the_N, ... }
 [that [_{DP} the boy] read the [_Nbook]]
 (2) [the_N [_N book that [_{DP} the boy] read e bəʊk]]

No minimality arises in (2) because what moves is a N and the potential intervener is a DP and the N part is too deeply embedded. This is why object RC are possible in adult language. Children, however, have problems with determiners and may opt for analyzing the article as a specifier of NP rather than the head of a separate projection. Therefore, (3) features an intervention effect because the article does not embed the N in subject position. Being a specifier, the label of the subject category is N, so the subject category N is closer to the external determiner than the object category N.

- (3) *Il bambino che la mamma bacia e bambino
 N [_{NP} D N] N

We will show how this analysis accounts for various modulation of the minimality effects and we will discuss evidence for language problems in dyslexia in the light of this theory.

Cognizing Language: I-Meanings and Semantic Competence

Terje Lohndal
University of Maryland

This talk will discuss what constitutes the semantic competence of a speaker of a human language. Starting out by framing language as a mental object of study, the talk will explore the nature of semantic competence from a mentalist perspective. It will contrast two views, one in which a speaker is endowed with a type-driven computation, and another more minimal one where a speaker is endowed with the ability to conjoin concepts. I will especially focus on the nature of the semantic operations from the minimalist perspective, and discuss whether they are language-specific or more related to logic. The talk will also argue that our mentalistic semantic competence is not based on truth, but rather that truth is an interaction effect.

Most Counterfactuals are False

Alan Hájek
The Australian National University

My title gives away my punch line: I argue that *most counterfactuals are false*. I focus on two strategies for showing a counterfactual of the form ‘if X were the case, then Y *would* be the case’ to be false: appealing to *indeterminism*—in particular, chanciness; and to *indeterminacy*—in particular, imprecision.

There is no particular way that a chancy process *would* turn out, however skewed the chances are. I argue for this in a number of ways, including by analogy to the untenability of Cournot’s Principle (“an event with low probability will not happen”) and by consideration of counterfactuals about lotteries. We apparently live in an indeterministic world, and most of the counterfactuals that we utter involve chancy processes, however skewed the chances may be. Similarly, there is no particular way that an indeterminacy *would* be resolved. Yet even if the world turns out to be deterministic, still most of the counterfactuals that we utter involve some indeterminacy. Either way, ‘might’ counterfactuals of the form ‘if X were the case, then Y *might not* be the case’ turn out to be true, and they are incompatible with the corresponding ‘would’ counterfactuals.

I consider, and reject, a number of rival positions. I concede that some counterfactuals are true in virtue of necessary connections between antecedents and consequents, but they are comparatively rare, and they do little to offset the preponderance of false counterfactuals.

While most of the counterfactuals that we utter are *false*, nonetheless they may be *assertable*, thanks to closely related true counterfactuals—e.g. ones with probabilistic consequents (which we comparatively rarely utter).

Semantics and Ontology

M.J. Cresswell
Victoria University of Wellington

Ontology is that part of metaphysics which is concerned with what there is. How then can we justify an ontology of ordinary everyday things? I suggest that the entry into such an ontology is the truth of ordinary non-philosophical sentences. But such sentences do not wear their ontology on their sleeves. You need to discern quantificational structure, and so I discuss the syntactic and semantic tests for discerning such structure.

In this talk I look particularly at the evidence from the underlying logical structure of modal and temporal discourse that natural language presupposes an ontology of times and possible worlds.

The claim may be expressed in the following argument:

- (1) Temporal operators are quantifiers.
- (2) ‘times’ are whatever temporal operators quantify over.

- (3) Some appropriate temporal sentences are true.
- (4) Modal operators are quantifiers.
- (5) 'worlds' are whatever modal operators quantify over.
- (6) Some appropriate modal sentences are true.

[This research is part of a joint project with A.A. Rini on the world–time parallel, supported by the Marsden Fund Council from Government funding, administered by the Royal Society of New Zealand, and by Visiting Fellowships at the Flemish Academic Centre for Science and the Arts, Royal Flemish academy of Belgium for Science and the Arts. The results will appear in *The World-Time Parallel: Tense and Modality in Logic and Metaphysics*, to be published by Cambridge University Press]

Epistemic Comparativism: A Contextualist Semantics for Knowledge

Ascriptions

Jonathan Schaffer
The Australian National University

Epistemic contextualism is the thesis that knowledge ascriptions are context sensitive. Zoltan Gendler Szabo and I develop and defend a contextualist semantics on which "know" is treated like a modal, denoting a ternary relation between a subject, a proposition p , and a proposition q that disjoins the relevant options. All knowledge is knowledge that: given q , p . We call this a comparativist semantics, since it treats knowledge as involving a comparison between the complement p and a contextually given proposition q .

Are There Different Kinds of Uncertainty?

Michael Smithson
The Australian National University

Is uncertainty a unitary concept, or are there different kinds? This question has long been debated in a normative mode (should a rational agent distinguish among different kinds of uncertainty?) but less extensively in a descriptive mode (do humans or other species think and act as if there are different kinds of uncertainty?). A systematic approach to this question in the descriptive mode is overdue.

This presentation focuses on the issue of establishing and evaluating evidence for and against the claim that uncertainty is not unitary. Five criteria are surveyed:

1. Consequentialist (e.g., Does one kind influence behaviour independently of another kind on the basis of perceived consequences?),
2. Doxastic (e.g., Are different kinds accorded different moral statuses?),
3. Correlational (e.g., Do different variables predict orientations toward different kinds?),

4. Cultural (e.g., Are kinds consistently distinguished from one another when referred to by members of the same linguistic community?), and
5. Neurological (e.g., Are different structures in the brain entrained by different kinds?).

A key concern is whether these criteria may be related to or constrain one another. This paper concludes that in many instances, satisfying one criterion implies little about whether others also have been satisfied. The question of whether uncertainty is unitary is itself not unitary.

Thought Experiments

Frank Jackson

Princeton University and The Australian National University

Thought experiments have played a major role in driving research in the philosophy of mind and cognitive science. Recent work in experimental philosophy raises important methodological questions about the appeal to thought experiments. In this lecture I respond to these questions from a representationalist perspective.

Guessing Rule 1: towards a 'Modest UG'

Avery D Andrews

The Australian National University

Universal Grammar has become a controversial topic, unfortunately rather disconnected from the everyday activities of many descriptive linguists, for which it ought to in principle be useful. In this talk, I will attempt to address this issue by proposing a principle for recognizing 'Noun Phrases', which is proposed as a start on a 'modest' version of the idea of Universal Grammar, intended to be consistent with the 'Simpler Syntax' approach to grammatical theory developed for example in Culicover and Jackendoff (2005), as well as the typical practice of many descriptives.

The principle, called here 'guessing rule 1', can be stated in a preliminary way as follows:

If a contiguous sequence of words 'identifies an entity', guess that it is a 'noun phrase'.

A variety of issues need to be addressed in order to develop this principle to a point where it can do useful work, including:

1. What under what circumstances might language-learners (especially children) be able to recognize which sequences or words 'identify entities' if they don't already know what the noun-phrases?

2. What about closed category items such as determiners, adpositions and case-markers on the edges of putative noun-phrases?

3. What happens when the guess is just wrong?

4. What is a 'noun-phrase', anyway, given the typological diversity in for example the number of functional projections that can be motivated over N?

The talk will consider these and other issues in order to develop the principle so as to apply in a plausible way to basic linguistics data.

Acquiring Sentential Negation in Child English

Rosalind Thornton
Macquarie University

Forty years ago, Bellugi (1967) and Klima & Bellugi (1966) observed that English-speaking children initially use *no* or *not* for sentential negation and the negative marker *n't* is absent, in contrast to the adult grammar, where *n't* is the preferred form. Drawing on Zeijlstra's (2004, 2008, in press) minimalist theory of negation and learnability I propose a new explanation of the asymmetry between children and adults and children's transition to the adult grammar. According to Zeijlstra (2004, in press), language learners do not instantiate functional projections without 'doubling' evidence in the positive input. The positive evidence for a NegP projection is negative concord, but this input is not available for children acquiring standard English. Children thus initially default to an adverbial form of negation (*no* or *not*) until they have sufficient evidence for a NegP functional projection to house *n't*. The initial adverbial analysis is supported by utterances such as *It not fits* in children's early repertoire of negative forms. Given that children acquiring standard English cannot access the most informative negative concord data, they struggle to find alternative evidence for *n't* as a syntactic head. Negative auxiliary verbs provide the evidence, but children have difficulty identifying their composition as *Aux + n't*. This explains why many children do not achieve productive use of negative auxiliary verbs until they are about 3 and a half years of age. The account predicts that until children add NegP to their functional hierarchy, they cannot ask negative questions with a negative auxiliary verb raised to C. Furthermore, once they do adopt NegP, children can, in principle, license negative concord, although it may soon be suppressed.

Cascading water, implicit naming and scalar implicature: experimental pragmatics in the post-modular era

Jesse Snedeker
Harvard University

Recent psycholinguistic studies offer a conflicting picture of how scalar implicatures (SI's) are calculated during comprehension. While many studies find that SI's are effortful and slow (see e.g., Huang & Snedeker, 2009), others have found that the enriched meanings of scalar terms are sometimes available as soon as the scalar trigger is spoken (Grodner et al., 2010).

To explain why this happens and what it means, I'll take you on a whirlwind tour of language processing in the post-modular era, emphasizing three points. 1) Language processing is cascaded with interpretation at one level beginning as soon as information begins to accumulate at the level below; 2) Comprehension depends not just on the bottom-up processes triggered by a word but also by the lingering effects of previously processed words and top-down processes initiated by conceptual representations; 3) Perceptual processing is also cascaded and is tightly integrated with linguistic representations. Consequently, visual input should place probabilistic top-down constraints on linguistic analysis. Evidence for this comes from the phenomenon of implicit naming (the verbal encoding of perceptual input in a nonlinguistic task) which emerges during infancy.

I will argue that these observations allow us to reconcile the conflicting findings on SI. When SI occurs through bottom-up processes, it is slow and delayed. But, when the demands of the task strongly constrain verbal encoding, SI appears to be instantaneous and effortless, simply because the relevant processes have occurred before the scalar trigger is ever spoken. Two recent experiments confirm the predictions of this proposal.

Phonological Constraints on the Acquisition of Grammatical Morphemes

Katherine Demuth
Macquarie University

Language acquisition researchers have long observed that children's early use of grammatical morphemes is highly variable. It is generally thought that this is due to incomplete syntactic or semantic representations. However, recent crosslinguistic research has found that the variable production of grammatical morphemes such as articles and verbal inflections is phonologically conditioned. Thus, children are more likely to produce grammatical morphemes in simple phonological contexts than in those that are more complex. This suggests that some of the variability in children's early production (and perception) of grammatical morphemes may be due to phonological context effects, and that some aspects of children's syntactic/semantic representations may be in place earlier than typically assumed. This raises important theoretical and methodological issues for

investigating syntactic knowledge in L1 acquisition, but also in bilinguals, L2 children and adults, and those with language impairment. Implications for understanding the mechanisms underlying language processing, the 'perception-production' gap, and a developmental model of speech planning, are discussed.

Synergies in Language Acquisition

Mark Johnson
Macquarie University

Each human language contains an unbounded number of different sentences. How can something so large and complex possibly be learnt? Over the past decade and a half we've learned how to define probability distributions over grammars and the linguistic structures they generate, making it possible to define statistical models that learn regularities of complex linguistic structures. Bayesian approaches are particularly attractive because they can exploit "prior" (e.g., innate) knowledge as well as learn statistical generalizations from the input.

This talk compares two different Bayesian models of language acquisition. A staged learner learns the components of language independently of each other, while a joint learner learns them simultaneously. A joint learner can take advantages of synergistic dependencies between linguistic components to bootstrap acquisition in ways that a staged learner cannot. We use Bayesian models to show that there are dependencies between word reference, syllable structure and the lexicon that a learner could take advantage of to synergistically improve language acquisition.

Integrated, predictive language models

Edward Stabler
University of California, Los Angeles

Recent results have made it easier to formulate and test linguistically sophisticated language models that analyze semantic, syntactic, morphological and phonological structure simultaneously and incrementally, allowing for more systematic study of interactions among these various aspects of human linguistic abilities. This talk will present particularly simple model which incrementally computes, exactly, the structural relations defined by a standard linguistic perspective. We then assess the challenge to such models posed by the existence of "merely local coherence" effects, cases where it seems that locally plausible but grammatically impossible analyses interfere with the recognition of grammatical analyses.

What's so great about compositionality?

Stuart Shieber
Harvard University

Compositionality is the tenet that the meaning of an expression is determined by the meanings of its immediate parts along with their method of combination. The semantics of artificial languages (such as programming languages or logics) are uniformly given compositionally, so that the notion doesn't even arise in that literature. Linguistic theories, on the other hand, differ as to whether the relationship that they posit between the syntax and semantics of a natural language is structured in a compositional manner. Theories following the tradition of Richard Montague take compositionality to be a Good Thing, whereas theories in the transformational tradition typically eschew it. I will look at what compositionality is and isn't, why it seems desirable, and whether its advantages can't be provided by other means.

Language acquisition, representation, and use: What can we learn from computational and experimental evidence?

Amy Perfors
University of Adelaide

Many of the recurring questions in linguistics centre around the nature of linguistic representations and the domain-specificity of the learning mechanism. In this talk I will discuss recent work that bears on these questions, combining computational models with experiments on humans. I will discuss some of the advantages and disadvantages of this sort of research program, and conclude with my sense of the largest challenges facing the field in the future.

Early word learning through communicative inference

Michael Frank
Stanford University

How do children learn their first words? While they are able to make use of distributional information about the co-occurrence of words and objects, even very young children also seem to take into account information about speakers' communicative intentions. Rather than being thought of as purely statistical or purely social, I argue that much of children's early word learning is best explained as a process of statistical inference about speakers' communicative intentions. First, I'll present eye-tracking data on children's social attention during word learning suggesting that children gradually become more oriented to the social world. Second, I'll show some experimental data on children's inferences about other people's communicative intentions. Finally, I'll show a computational model that

instantiates a simple version of communicative inference and can both learn words accurately from natural corpus data and predict a range of developmental results. In sum, this research suggests that a communicative inference framework can explain a wide variety of developmental results in early word learning.

The Statistical Problem of Language Acquisition

Mark Steedman
University of Edinburgh

The talk will report on recent work with Tom Kwiatkowski, Sharon Goldwater, and Luke Zettlemoyer on semantic parser induction by machine from a number of corpora pairing sentences with logical forms, including a corpus consisting of real child-directed utterance from the CHILDES corpus.

The problem of child language acquisition is often identified as a "logical" problem. The term refers to the fact that children learn language rapidly from exposure to a sample of utterances in the language, and seem to need access to some other source of information than mere positive examples of the sentences of the language.

The most obvious candidate for this other source of information, at least in the earliest stages of language acquisition, is representations of meaning, in the form of logical forms supported by the contextual situation, available in the case of the child on the basis of pre-linguistic sensory-motor cognition (in which we should include certain kinds of social cognition). In the case of machines, there has been some success recently on this task for datasets such as GeoQuery and ATIS, including multi-lingual versions.

The paper argues that the problem of language acquisition interpreted in this way is similar to the problem of inducing a grammar and a parsing model from a treebank such as the Penn treebank, except that a) the trees are unordered logical forms, in which the preterminals are not aligned with words in the target language, and b) there may be noise and spurious distracting logical forms supported by the context but irrelevant to the utterance.

The talk shows that this class of problem can be solved if the child or machine initially parses with the entire space of possibilities that universal grammar allows under the assumptions of the Combinatory Categorical theory of grammar (CCG), and learns a generative statistical parsing model for that space using EM algorithm-related methods such as Variational Bayes learning. Because of the "winner takes all" character of Bayesian learning, this system gives the appearance of parameter-setting, without the use of parameters or attendant "triggers", and without requiring adherence to any "subset principle", provided only that the system is presented with a representative sample of reasonably short utterances from the target language.

Semantic Satisficing and the Core Semantic Properties of Conditionals

Drew Khlentzos
University of New England

What are the core semantic properties of indicative conditionals? No one believes these can be discerned in an entirely theory-neutral way. Yet almost every inference rule mediating conditionals or mooted logical equivalence between them has been called into question. Thus counter-examples have been proposed not only to Strengthening, Transitivity and Modus Tollens but also to Modus Ponens. Even basic semantic principles such as that antecedents of conditionals comprise downward-entailing contexts have been subject to challenge. The pessimistic conclusion is that core semantic properties of conditionals are perforce theory-relative and the best theory of conditionals is simply the one that accommodates most of our intuitions. In this talk I argue against this type of semantic satisficing, defending the view that theories of conditionals can and should be assessed as empirically adequate to the extent that they conserve certain core principles and basic entailments.

Poster Presentations

Session 1

Tuesday, 23rd August, 3.00pm – 4.00pm, MGSM Hotel Foyer

Pronoun Reversals in Young Children: The Role of Parental Input

Neha Khetrapal and Katherine Demuth

Department of Linguistics, Centre for Language Sciences (CLaS)

ARC Centre of Excellence in Cognition and its Disorders (CCD)

Macquarie University

Linguistic Constraints in Code-switching

Amanda Miller Amberber

Macquarie Centre for Cognitive Science, Macquarie University

Language, Logic and Code-switching

Amanda Miller Amberber

Macquarie Centre for Cognitive Science, Macquarie University

Children's understanding of the logical words 'not', 'every', and 'or'

Anna Notley (presenting a poster on behalf of Anna Notley, Rosalind Thornton and Stephen Crain)

ARC Centre of Excellence in Cognition and its Disorders

Macquarie University

Disjunction and Conditionals in Child Mandarin

Yi (Esther) Su

Macquarie Centre for Cognitive Science, Macquarie University

Does Accent interact with Utterance-Position?

Ivan Yuen, Katherine Demuth, Felicity Cox

Macquarie University

The basic semantics of conditionals in natural language

Likan Zhan, Stephen Crain, *Macquarie University*

Drew Khlentzos, *University of New England*

Session 2

Thursday, 25th August, 3.00pm – 4.00pm, MGSM Hotel Foyer

The Interpretation of Complement Anaphora in Discourse

Nobuaki Akagi and Francesco-Alessio Ursini,

Macquarie Centre for Cognitive Science, Macquarie University

Desiderata for a Computational Model of Hesitation

Ilya Anisimoff, Robert Dale and Rolf Schwitter

Macquarie University

Grounded Learning as a PCFG Learning Problem

Benjamin Börschinger

Macquarie University

With Bevan Jones (*University of Edinburgh*) and

Mark Johnson (*Macquarie University*)

Causality and Belief Change

Kinzang Chhogyal

Griffith University, Brisbane, Australia

Abhaya Nayak, Rolf Schwitter

Macquarie University, Sydney, Australia

Metalinguistic negation, echoic negation or pretence of descriptive negation?

Francesco Gentile

Department of Philosophy, University of Nottingham

Scope interaction between *wh*-indefinites and negation: Insights from language acquisition

Aijun Huang and Stephen Crain

Macquarie University

The interpretation of plural pronouns in discourse

Francesco-Alessio Ursini and Nobuaki Akagi

Macquarie Centre for Cognitive Science, Macquarie University