Contents

All talks will take place in the main Concert Hall.

The poster exhibition will be held in the Recital Room and the publishers' exhibition in the Foyer. Lunch and refreshments will be served in both of the exhibition spaces.

Please wear name badges at all times.

Acknowledgements

We would like to thank Cambridge English Language Assessment for their generous support of this event, and to acknowledge the funding received from the School of the Biological Sciences and the Computer Laboratory, University of Cambridge.

Additional thanks go to Cambridge University Press for hosting the drinks reception at their bookshop, and to John Benjamins for their kind donation.

Conference organized by Jane Walsh, Coordinator for Cambridge Language Sciences.

Session organizers: *Interdisciplinary perspectives on multilingualism* Dr. Henriëtte Hendriks, Dr. Nick Saville; *Beyond our primate inheritance: neurobiological and evolutionary approaches to language* Dr. Matt Davis, Professor Robert Foley, Professor William Marslen-Wilson; *Diversity and universals* Professor Geoffrey Khan, Professor Ian Roberts; *Philosophy of language meets computational linguistics* Professor Ann Copestake, Professor Kasia Jaszczolt

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Welcome

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The past fifty years have witnessed an explosion of research in the language sciences, facilitated in some cases by advances in technology within fields such as neuroscience, computer science and genetics, and in others by research based on "traditional" methods of scholarship and new theoretical approaches.

Anyone seeking to achieve an overall understanding of the field may feel challenged not just by the amount of publishing on the subject, but also by the numerous methodological approaches, the different types of data, the technical equipment used and, importantly, by the jargon and technical language used within a particular research community to report their findings.

This conference promotes dialogue between language scientists of all disciplines by inviting work from very different domains (including neuroscience, biology, anthropology, computer science, engineering, philosophy, psychology, education, languages and linguistics) in order to explore key issues and to share our research in a fruitful and productive way.

On behalf of the Steering Committee of Cambridge Language Sciences, we are delighted to welcome colleagues from the University of Cambridge and beyond, and we hope that this conference will provide not just a glimpse into the research agendas of others, but also a better understanding of the potential for future collaboration.

Henriëtte Hendriks
William Marslen-Wilson
Co-Chairs, Cambridge Language Sciences Strategic Research Initiative

Programme

Thursday 3 October

8.00–9.00	Registration, refreshments
9.00–9.30	Opening of the conference by Dr. Henriëtte Hendriks. Welcome by the Vice-Chancellor, Professor Sir Leszek Borysiewicz.

SESSION 1: INTERDISCIPLINARY PERSPECTIVES ON MULTILINGUALISM

9.30–10.30	**Plenary** *Bilingualism as a tool to investigate the mind and brain* Professor Judith Kroll, Center for Language Science, The Pennsylvania State University
10.30–11.00	*Multilingual planet – multi-language learners: challenges for the language researcher* Dr. Henriëtte Hendriks, Dept. of Theoretical and Applied Linguistics, University of Cambridge
11.00–11.30	Refreshments
11.30–12.00	*Computational approaches to Second Language Acquisition: empirical challenges* Dr. Dora Alexopoulou, Dept. of Theoretical and Applied Linguistics, University of Cambridge
12.00–12.30	*The European Survey on Language Competence: the impact of multilingual language assessment on language policy and educational outcomes* Dr. Neil Jones, Research and Validation, Cambridge English Language Assessment
12.30–13.00	*Q&A and panel discussion* Chaired by Dr. Nick Saville, Research and Validation, Cambridge English Language Assessment
13.00-14.00	Lunch Poster sessions, presentations by early careers researchers

SESSION 2: BEYOND OUR PRIMATE INHERITANCE: NEUROBIOLOGIAL AND EVOLUTIONARY APPROACHES TO LANGUAGE

14.00–15.00	**Plenary** *The evolution of conversations through coupled oscillations* Professor Asif Ghazanfar, Princeton University
15.00–15.30	Refreshments
15.30–16.00	*Intonation: from animal communication to grammatical encoding* Dr. Brechtje Post, Dept. of Theoretical and Applied Linguistics, University of Cambridge
16.00–16.30	*Neural predictions supporting speech comprehension* Dr. Matt Davis, Medical Research Council Cognition and Brain Sciences Unit
16.30–17.00	*Thinking inside the box: constraining models for the evolution of language* Professor Robert Foley and Dr. Marta Mirazón Lahr, Leverhulme Centre for Human Evolutionary Studies, University of Cambridge; Professor William Marslen-Wilson, Dept. of Psychology, University of Cambridge
17.00–17.30	*Q&A and panel discussion* Chaired by Professor Lorraine Tyler, Centre for Speech, Language and the Brain, University of Cambridge
18.00–19.30	Drinks reception at the Cambridge University Press bookshop, 1 Trinity St.
20.00–22.00	Conference dinner at Sidney Sussex College, Sidney St.

Friday 4 October

8.30–9.00	Registration, refreshments
9.00–9.30	Announcements, presentations to winners of the poster competition

SESSION 3: DIVERSITY AND UNIVERSALS

9.30–10.30	**Plenary** *Diachronic alignment typology: explaining split ergativity as the outcome(s) of the motivated evolution of grammar* Professor Spike Gildea, University of Oregon
10.30–11.10	*Dialectal diversity and diachronic change: the case of Modern Aramaic* Professor Geoffrey Khan, Faculty of Asian and Middle Eastern Studies, University of Cambridge
11.10–11.40	Refreshments
11.40–12.20	*Probing a typological gap: cognitive evidence for an accusative bias?* Dr. Michelle Sheehan and Dr. John Williams, Dept. of Theoretical and Applied Linguistics, University of Cambridge
12.20–13.00	*Unity and diversity of Turkic evidentials* Dr. Elisabetta Ragagnin, Faculty of Asian and Middle Eastern Studies, University of Cambridge
13.00-14.00	Lunch Poster sessions, presentations by early careers researchers

SESSION 4: PHILOSOPHY OF LANGUAGE MEETS COMPUTATIONAL LINGUISTICS

14.00-15.00	**Plenary** *Combining data and theory in lexical and compositional semantics* Professor Nicholas Asher, Centre National de la Recherche Scientifique, Toulouse
15.00-15.30	Refreshments
15.30-16.00	*Speaker's commitment and semantic commitment* Professor Richard Holton, Faculty of Philosophy, University of Cambridge
16.00-16.30	*Rethinking compositionality* Professor Kasia M. Jaszczolt, Dept. of Theoretical and Applied Linguistics, University of Cambridge
16.30-17.00	*Is formal semantics sufficient for computational linguistics?* Dr. Stephen Clark, Computer Laboratory, University of Cambridge
17.00-17.30	*Denotation and distributions* Professor Ann Copestake and Dr. Aurélie Herbelot, Computer Laboratory, University of Cambridge
17.30-18.00	Closing remarks by Professor William Marslen-Wilson

Bilingualism as a tool to investigate the mind and brain

Judith F. Kroll

Department of Psychology, Program in Linguistics, Center for Language Science, The Pennsylvania State University

Judith F. Kroll is Distinguished Professor of Psychology, Linguistics, and Women's Studies and Director of the Center for Language Science at Pennsylvania State University. She held faculty positions at Swarthmore College, Rutgers University, and Mount Holyoke College before joining the Penn State faculty in 1994. The research that she and her students conduct concerns the way that bilinguals juggle the presence of two languages in one mind and brain. Their work, supported by grants from the National Science Foundation and the National Institutes of Health, shows that bilingualism provides a tool for revealing the interplay between language and cognition that is otherwise obscure in speakers of one language alone. She is a Fellow of the American Association for the Advancement of Science, the Association for Psychological Science, the American Psychological Society, and the Society of Experimental Psychologists.

Abstract

More people in the world are bilingual than monolingual. Yet historically, the language sciences have focused almost exclusively on monolinguals and largely on English as the universal language. In the past decade there has been a radical shift to acknowledge the consequences of bilingualism for characterizing language, understanding the way that languages are learned, and identifying the cognitive and neural consequences of life in two languages. A critical insight is that bilingualism provides a tool for revealing aspects of cognitive and brain function that are otherwise obscured within monolinguals. From this perspective, bilinguals are model subjects for scientists who wish to identify constraints and plasticity in learning that may be otherwise obscured in studies of individuals who speak only a single language. Appreciation of this possibility has triggered a virtual explosion of research and scholarship on the science of bilingualism.

Multilingual planet – multi-language learners: challenges for the language researcher

Henriëtte Hendriks

Department of Theoretical and Applied Linguistics, University of Cambridge

Henriëtte Hendriks is Reader in Language Acquisition and Cognition in the Department of Theoretical and Applied Linguistics, where she is also Head of Department. Her principal interests are in applied- and psycholinguistics, and specifically in the interaction between language acquisition and cognition and language acquisition and culture for languages including Dutch, German, English, French, Chinese and Polish. Her research questions address the influence of language-specific differences on first- and second-language acquisition, and the effects of cognitive maturity on the acquisition process. She is currently involved in the *Langacross* Project which deals with utterance structure in context from an acquisitional (L1 and L2) and cross-linguistic point of view and is funded by L'Agence nationale de la recherche and the DFG German Research Foundation, in the *VILLA* project which deals specifically with the effects of input on guided and non-guided learners and adults and children, and in the EF Research Unit which deals with English as a second language. Dr. Hendriks has also researched the domain of space in collaboration with Dr. Maya Hickmann in the SALTAC project.

Abstract

In the early days of language acquisition research, it was believed that language learning happened either by children learning their mother tongue in a natural environment (first language acquisition), or by adolescents learning a language at school (guided second language acquisition). It was only in the 1980s that researchers started to acknowledge that many of us are born into a multilingual environment, and therefore acquire (at least) two languages simultaneously from birth; and that humans may also learn languages in a more natural environment through migration to another country (non-guided second language acquisition). In the last 15 years, with the onset of globalization, the types of language acquisition have multiplied: we find Chinese 3-year-olds learning English in private schools, and Polish 5-year-olds learning English in England; a German businessman learning English through Rosetta Stone, and a Spanish grandmother learning English in the US from her Spanish grandchildren.

The different circumstances in which people learn languages bring with them different factors (age, input, motivation, and so on) which may all influence the rate and success of language learning. How to control for these factors, and how to take them into account properly, however, is a puzzle not yet entirely solved by the researcher, hence the title of this talk.

In this paper, by discussing some of my own and others' research, I will show how little we know about the most frequently studied group of language learners, i.e., child first language learners; what we know about the impact of the various factors to date; what we should do to control for the multiple factors; and how, more generally, the ever changing landscape of language learning remains a challenge for the researcher.

Computational approaches to Second Language Acquisition: empirical challenges

Authors: Theodora Alexopoulou, Anna Korhonen and Jeroen Geertzen

Department of Theoretical and Applied Linguistics, University of Cambridge

Dora Alexopoulou is a Senior Research Associate at the Department of Theoretical and Applied Linguistics (DTAL). She leads the Education First Unit at the University of Cambridge, launched in February 2010 to promote research in second language learning of English and innovation in language teaching through a systematic cross-fertilisation between linguistic research and teaching techniques.

After a BA in Greek philology at the University of Athens, she went to Edinburgh to obtain an MSc in Natural Language and Speech Processing and then a PhD in Linguistics. Before coming to Cambridge she worked at the Universities of Edinburgh and York, and held an Intra-European Marie Curie Fellowship at the University of Lille III.

Her research interests are in second language learning and theoretical and experimental syntax. She has published articles in *Language, Cognition, Journal of Linguistics, Natural Language and Linguistic Theory*, and *Lingua*, as well as volumes and conference proceedings.

Abstract

Second Language Acquisition (SLA) is a complex domain of human cognition due to the enormous individual and contextual variation in learning. At the same time, SLA allows us to investigate language acquisition abstracting away from its challenging interactions with the development of theory of mind and world knowledge of young children and the maturation of their general cognitive capacities. SLA (adult) learners have mature cognitive mechanisms, rich world knowledge, a developed theory of mind, semantic and discourse representations of the meanings they wish to communicate. Intuitively, they know *what* they wish to say, they need to learn *how* to say it.

Large corpora of language productions of second language learners are vital for SLA research and are increasingly becoming available. Exploiting the potential of such data resources necessitates computational technology that enables empirical evaluation of competing theoretical hypotheses and modelling longitudinal SLA development.

In this talk, we focus on the central question of mother tongue (L1) effects; the ways in which one's native language shapes SLA at early stages of acquisition and how SLA learners recover from native language effects as their knowledge of L2 progresses. We show the relevance of computational approaches to address empirical challenges in investigating L1 effects in corpus data. Our results have consequences for competing theoretical hypotheses regarding the availability of L1 structures at the initial state of SLA. Our research is based on EFCamDat, an L2 database recently built at the Department of Theoretical and Applied Linguistics in collaboration with EF Education First (available at corpus.mml.cam.ac.uk/efcamdat).

The European Survey on Language Competences: the impact of multilingual language assessment on language policy and educational outcomes

Neil Jones

Research and Validation, Cambridge English Language Assessment

Neil Jones holds a PhD in Applied Linguistics from the University of Edinburgh on applying item response theory. After teaching English in countries including Poland and Japan, where he set up and directed programmes at university level, he joined Cambridge English in 1992. He has led innovative developments including item-banking and computer-adaptive testing, and worked on the construction and use of multilingual proficiency frameworks, including the Common European Framework of Reference. He directed research for Asset Languages, a 25-language assessment system developed for the UK government's national languages strategy, and most recently directed the first European Survey on Language Competences, coordinated by Cambridge English Language Assessment for the European Commission. His current interest is Learning Oriented Assessment, an approach which integrates all levels of assessment to produce the most positive learning outcomes.

Abstract

The European Survey on Language Competences (ESLC) is a major study coordinated by Cambridge English for the European Commission. Completed in 2012, it demonstrated that language learning outcomes in Europe vary greatly from country to country. This presentation of the survey and its findings will focus on the substantive psychometric and technical issues involved in aligning five different languages to a common measurement scale, on the contextual factors found to be associated with success in languages, and on the implications for language policy makers to be drawn from the complex picture which emerges. The ESLC is the latest in a series of initiatives by Cambridge English to use language assessment expertise to impact positively on language education outcomes. Cambridge English is increasingly engaging at national and institutional level, specifically in relation to the teaching and learning of English, but also in helping to develop policy in relation to languages in education more widely. The presentation will illustrate the range of language sciences drawn on in developing Cambridge English language assessments, and make the case that work in this area is of great potential significance, both for language sciences in the University, as for its practical impact on language education worldwide.

The evolution of conversations through coupled oscillations

Asif A. Ghazanfar

Princeton University

Asif A. Ghazanfar is an Associate Professor at Princeton University in the Neuroscience Institute and the Departments of Psychology and Ecology & Evolutionary Biology. He completed his undergraduate degree in Philosophy at the University of Idaho and his doctoral degree in Neurobiology at Duke University. After postdoctoral work studying primate communication at Harvard University and neurophysiology at the Max Planck Institute for Biological Cybernetics in Germany, he joined the faculty at Princeton in 2005. His lab operates at the interface of neuroscience, developmental biology, morphology and evolution. His interests are primarily in how social communication *emerges* through the dynamic interactions between neural systems, the body, pre- and post-natal experience and socioecological context.

Abstract

Cooperation is central to human communication. The quality of any verbal interaction requires more than just cues that signal meanings—they require precise timing that is managed locally by the interlocutors. That is, foundational to all semantic verbal communicative acts is a more general one: taking turns to speak. Conversations proceed smoothly because of turn-taking. Given its central importance in everyday human social interactions, it is natural to ask how conversational (or *vocal*) turn-taking evolved. It's been argued that human cooperative vocal communication is unique and evolved via manual gestures produced by ape-like ancestors. The transition from primarily gestural to primarily vocal forms of cooperative communication remains somewhat mysterious. We used common marmoset monkeys to test whether this species exhibits cooperative vocal communication in the form of turn-taking. Marmosets don't produce manual gestures but share with humans a cooperative breeding strategy and volubility. These cooperative care behaviors scaffold prosocial motivational and cognitive processes not typically seen in other primate species. We capitalized on the fact that marmosets are not only prosocial but are highly vocal and readily exchange vocalizations with conspecifics. By measuring the natural statistics of vocal behavior of marmosets, we observed that they take turns in extended sequences of call exchanges, and show that this vocal turn-taking has its foundation in a mechanism that takes the form of coupled oscillators. As marmoset monkeys are on a different branch of the evolutionary tree that led to humans, our data demonstrate convergent evolution of vocal cooperation. Moreover, our data offer a plausible alternative scenario for how human cooperative vocal communication could have evolved.

Intonation: from animal communication to grammatical encoding

Authors: Brechtje Post[1], Emmanuel Stamatakis[2], Iwo Bohr[1], Francis Nolan[1], Chris Cummins[1]

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[2]Division of Anaesthesia, University of Cambridge

Brechtje Post is Reader in Experimental Phonology at the Department of Theoretical and Applied Linguistics, University of Cambridge. Her research focuses primarily on prosody and intonation, investigating how linguistic systems exploit speech sound to encode different types of meaning. She approaches this theme from different angles: phonetics, phonology, language acquisition, language psychology, and cognitive neuroscience.

She has just completed a major research project on the neural processing of intonational information (ESRC), as well as an international project on prosodic development *APriL* (British Academy & Batista i Roca). Current research includes the *EF Cambridge learner corpus* project (Newton Trust & Education First), the *English Profile Pronunciation Project* (Cambridge ESOL), *The acquisition of consonant timing* (British Academy & Leverhulme), *Empirical foundations of linguistics* (Agence Nationale de la Recherche), and the *Interactive Atlas of Romance Prosody* (Fundação para a Ciência e a Tecnologia).

She has published in *Cognition, Linguistics, Journal of Phonetics, Language and Speech, Neuropsychologia, Speech Communication*, and *Langue Française*.

Abstract

Intonation, or the melody of speech, plays a central role in human communication, since it can provide immediate cues to the start of new words or phrases in the speech stream, and to the meaning of utterances. Consequently, wrong intonation often leads to communication breakdown.

However, intonation is difficult to analyse, because it signals multiple functions simultaneously. For instance, while some of the intonational information in the signal is interpreted categorically (e.g. a rising pitch contour signals a question instead of a statement), it can also be more gradient (e.g. a higher rise can sound increasingly excited). The latter type of intonational information has been argued to be a direct product of our primate inheritance, reflecting biologically driven codes which are exploited to express attitudes and emotions universally across the languages of the world, such as higher pitch expressing excitement. This use of intonation is distinct from the former, linguistically codified use of intonation, which is language-specific, and in which the relation between form and function is often arbitrary. However, the question of how the relationship between form and meaning is best formalized in a theoretical model has been a topic of debate for decades, and the empirical evidence has been inconclusive.

In this study, we show for the first time that intonation engages distinct, but overlapping neural systems depending on function (i.e. the categorical vs. gradient information mentioned above), reflecting the processing of other types of linguistic information in the speech signal. The findings confirm our hypothesis that hierarchically organized neural processing is a universal characteristic of speech processing, which encompasses both segmental and

suprasegmental properties, and whereby dissociations in lower-level auditory and higher-level linguistic subprocesses reflect distinctions made in current intonational theory. That is, the observed dissociations provide the first neurobiological evidence for the key theoretical construct of the theoretical framework for intonation analysis (the "Autosegmental-Metrical approach") that is predominant in the field, and on which virtually all current research in intonation hinges. As outlined above, according to this construct categorical, linguistically used information in intonation is crucially distinguished from gradiently varying information in the language system.

The implication is that intonation has a dual function which is supported by distinct cognitive and neural mechanisms; the one being encoded in the linguistic system, and the other reflecting biological imperatives much more directly.

This research was funded by ESRC First Grant RES-061-25-0347(PI Post, CI Stamatakis).

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Neural predictions supporting speech comprehension

Matthew H. Davis

Medical Research Council, Cognition and Brain Sciences Unit, Cambridge, UK

Matt Davis is a Programme Leader in Hearing and Language at the Medical Research Council Cognition and Brain Sciences Unit in Cambridge. He completed his undergraduate degree in Experimental Psychology at Oxford University, and a PhD in Psycholinguistics at Birkbeck College, London. He joined the Language group at the Cognition and Brain Sciences Unit as a post-doctoral scientist and was made a Programme Leader in 2012. During his time in Cambridge he has focused on understanding the computational and neural mechanisms supporting adaptive processing of spoken language. These mechanisms are evident when we make sense of degraded speech sounds, adapt to a novel accent, resolve transient ambiguities in connected speech or learn new words and meanings. His research group uses a variety of methods from psycholinguistics, cognitive science and neuroscience, including behavioural studies, computational modelling and digital speech manipulation, fMRI and EEG/MEG.

Abstract

Humans perceive speech sounds using an auditory system that is largely conserved across a range of mammalian species, yet can communicate complex ideas that far exceed the capacities of our closest ancestors. In this talk, I will present a range of evidence that auditory processes in the superior temporal gyrus contribute to successful perception and comprehension of spoken language by receiving top-down predictions from higher-level processes. These predictions allow the auditory system to use expectations (priors) for upcoming syllables, words or meanings to inform immediate perception. Accurate and erroneous predictions further cue learning and adaptation processes that enhance comprehension of future utterances. While these computational mechanisms – a form of predictive coding – are conserved across a range of species, the complexity of spoken language allows for sophisticated prediction using lexical and semantic information that is unique to humans. This perspective will be illustrated using functional brain imaging (fMRI and M/EEG) studies of speech perception and comprehension of novel, degraded or ambiguous speech signals.

Thinking inside the box: constraining models for the evolution of language

Robert Foley[1], Marta Mirazón Lahr[1], William Marslen-Wilson[2]

[1]Leverhulme Centre for Human Evolutionary Studies, University of Cambridge
[2]Department of Psychology, University of Cambridge

Robert Foley is Leverhulme Professor of Human Evolution at the University of Cambridge. With Marta Mirazón Lahr he co-founded the Leverhulme Centre for Human Evolutionary Studies (LCHES), a research centre devoted to multi-disciplinary approaches to human evolution. He has worked on a range of topics, from the early hominins and bipedalism to the evolution of human social behaviour, to the origins of modern humans and historical linguistics and human diversity. His particular interests lie in the ecological foundations of human behavior and cognition, and how the principles of evolutionary ecology can be used to explore human uniqueness.

Marta Mirazón Lahr is Reader in Human Evolutionary Biology and Director of the Duckworth Collection at the University of Cambridge, and a co-founder (with Robert Foley) of the Leverhulme Centre for Human Evolutionary Studies. Her work has focused mainly on the evolution and diversity of modern humans, Homo sapiens. This research has involved a range of disciplines, including human palaeontology, evolutionary genetics, behavioural ecology, linguistics and archaeology. She currently has field projects in Libya (prehistory), India (anthropology and genetics) and Kenya (palaeoanthropology). The diversity of humans is a central research topic, particularly the role of behavioural, reproductive and cultural factors (including language) in shaping how humans moved from a small population in Africa to a diverse, global one.

William Marslen-Wilson is Honorary Professor of Language and Cognition in the Department of Psychology, University of Cambridge, where he leads an interdisciplinary research team studying the neuro-cognitive foundations of the human language function (www.neurolex.psychol.cam.ac.uk). His current research brings together behavioural, neuropsychological and neuroimaging data from contrasting languages (such as Arabic, Chinese, Polish, and English) to determine the underlying general properties of human language as a neuro-cognitive system. Professor Marslen-Wilson was formerly Director of the Medical Research Council Cognition and Brain Sciences Unit in Cambridge.

Abstract

The evolution of language is a subject notoriously difficult to pin down. Approaches from animal behaviour use a phylogenetically remote comparison; palaeontological approaches have only limited access to relevant anatomical structures; archaeological evidence is by necessity strongly inferential; language history does not preserve an old enough signal; and approaches based on extant human brain structures, language production and psychology are limited to the end product, not the process of evolution and earlier historical states. Genetics has yet to combine functional historical evidence for more than a handful of genes, and depends on a host of other approaches.

Despite these difficulties, we argue here that the way forward derives from combining the constraints from multi-disciplinary approaches. Each discipline does not allow an infinite range of possibilities, in terms of the timing and context for language evolution. Archaeology, for example, may not prove the presence of language at a particular moment, but it does limit the possibilities to a finite set. So do other disciplines; for example, the universality of human language abilities precludes an origin later than the genetic and geographical divergence of human populations. Neurobiology provides important clues to potential evolutionary pathways from nonhuman primate systems, separating more general communicative capacities to potentially human-specific language-related capacities.

In this paper we attempt to triangulate the "space" in which language is likely to have evolved. Within this chronological, functional and linguistic context we explore a hypothesis that language evolution is a multi-step process, involving both bihemispheric and left hemisphere processes, generating cumulative change linked to shifts in behaviour, and occurring over a period of less than 1 million years.

Diachronic alignment typology

Explaining split ergativity as the outcome(s) of the motivated evolution of grammar

Spike Gildea

Department of Linguistics, University of Oregon

Spike Gildea is Professor of Linguistics at the University of Oregon and Series Co-Editor of *Typological Studies in Language*, with interests in descriptive and documentary linguistics, comparative linguistics, the typology of alignment systems, and the reconstruction of morphosyntax. He has conducted fieldwork in South America since 1988, collecting primary data from 15 languages in Venezuela, Brazil, and Guyana, and supervising descriptive dissertations by eight students. His historical and comparative work is primarily in the reconstruction of morphology and syntax in the Cariban language family; in collaboration with colleagues, he has also reconstructed elements of main clause morphosyntax for two other language families and two isolates in South America. He is currently working on writing up a series of recent reconstructions of hierarchical alignments (in both North and South America) and ergative alignments (mostly in South America), all of which should contribute to a diachronic typology of alignment types.

Abstract

Cross-linguistically, main clause grammatical patterns can be quite different from the traditional subject and objects of European languages. One pattern, called ergative-absolutive alignment, splits the subject into two categories: the transitive subject (A) receives a unique marking, called ERGATIVE, whereas the intransitive subject (S) aligns with the object (P) to form the ABSOLUTIVE category. For example, in Makushi (Cariban; Brazil), the transitive subject (A) bears an ergative case suffix and follows the verb phrase while the intransitive subject (S) and transitive object (P) are in the unmarked absolutive case and precede the verb inside the VP.

	[	P		V	]	A
(1)	*tî-*	*nmu-**Ø***	*eporî-'pî*	*warayo'-**ya***		
	3.REFL-son	-ABS	find	-PAST	man	-ERG
	'The man$_i$ found his$_i$ son.'					

			[	S		V]
(2)	*tî-*	*nmî -rî -ya*		*warayo-**Ø***	*wîtî-'pî*	
	3REFL-field-PSD-LOC		man	-ABS	go	-PAST
	'The man$_i$ went to his$_i$ field.'					

When a language has ergative alignment, it is usually found in only a subset of grammatical contexts, creating what has been called "split ergativity." In one supposedly universal pattern, called tense-aspect-based split ergativity, the ergative alignment occurs only in past tense or perfective aspect clauses, with some other alignment (usually the familiar nominative-accusative) occurring in nonpast and imperfective clauses. Theoreticians have tried to explain these splits as a grammatical expression of abstract notions like viewpoint, transitivity, inherent agentivity, and ontological salience.

However, in recent research, we have discovered that multiple languages from the Cariban and Jê families (spoken in northern and central South America) present the opposite pattern, in which ergative alignment occurs only in nonpast and imperfective clauses. This talk presents several cases of counter-universal ergative splits, leaving no doubt about the basic facts. Trivially, such facts contradict the putative universal about split ergativity; less trivially, they call into question the proposed explanations for that universal. But in this talk, I will go farther to argue that they suggest an

entirely different conceptualization of split ergativity, in which explanation does not lie in abstract correlations, but rather in the concrete details of the historical processes that create the individual clause types with their distinct alignments. This sort of explanation is an example of the larger theoretical perspective of diachronic typology.

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Dialectal diversity and diachronic change: the case of Modern Aramaic

Geoffrey Khan

Faculty of Middle Eastern Studies, University of Cambridge

Geoffrey Khan is Regius Professor of Hebrew at the Faculty of Asian and Middle Eastern Studies, University of Cambridge. He received his BA degree and PhD in Semitic languages at the School of Oriental and African Studies. His research interests include the history of the Hebrew language and the Modern Aramaic dialects. He has carried out extensive fieldwork on Modern Aramaic in the Middle East, the Caucasus, Central Asia, Europe, North America, Australia and New Zealand. In the field of Hebrew he has recently edited the *The Encyclopedia of Hebrew Language and Linguistics* (4 vols., Brill, 2013). He is Fellow of the British Academy and Honorary Fellow of the Academy of Hebrew Language (Jerusalem).

Abstract

The Modern Aramaic dialects exhibit considerable diversity in the way they have developed historically from earlier forms of the language. This applies particularly to the sub-group known as North-Eastern Neo-Aramaic (NENA), which comprises over one hundred different dialects in the border areas of Turkey, Iraq and Iran. This paper will illustrate this by a study of the varying manifestations of morphological ergativity that are attested in the dialects. Historically, Aramaic (Semitic) is nominative-accusative, and ergativity developed through contact with ergative Iranian languages, especially Kurdish, which is also spoken in the region. Ergativity developed in the perfective aspect only, and is marked by verb-agreement rather than case. NENA dialects can be divided into three types according to their degree of ergativity, reflected by differences in the distribution of the ergative marking of intransitive verbs. In dialects exhibiting the highest degree of ergativity, which is termed Split-S, the ergative marker is restricted to transitive and unergative verbs, and is not found with unaccusative verbs. In a second type of dialect, which is termed Dynamic-Stative, the ergative marker is also optionally found with unaccusative verbs. Dialects exhibiting the lowest degree of ergativity, Extended-Ergative, mark all intransitive subjects as ergative. This is surprising from the perspective of theories of ergativity, since it contradicts Marantz's Generalization, and suggests that ergative case is not inherent but structural. The possible diachronic development of these various ergative systems are discussed. It is argued that the Extended Ergative system did not develop historically from the other systems but is rather the result of only partial convergence with ergative systems in languages in contact.

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Probing a typological gap: cognitive evidence for an accusative bias?

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Michelle Sheehan specializes in Romance linguistics, theoretical syntax and formal generative typology. She is particularly interested in null arguments, case/agreement alignment, word order, the syntax-semantics interface and the architecture of grammar as well as in experimental methods and the philosophy of language. She is co-author of the Cambridge University Press volume *Parametric Variation: Null Subjects in Minimalist Theory* (2010) and the forthcoming *The Philosophy of Universal Grammar* (2013), and co-editor of the forthcoming *Theoretical Approaches to Disharmonic Word Orders* (2013) and has published papers on clausal-nominal parallels, word order (including extraposition and "free" inversion), linearization, island effects, labeling, diachronic change and language contact. She is currently a Research Associate on the ERC-funded project Rethinking Comparative Syntax led by Ian Roberts.

John Williams is Reader in Psycholinguistics in the Department of Theoretical and Applied Linguistics. He specializes in the cognitive mechanisms of second language learning and second language lexical and syntactic processing. His work draws on theoretical concepts and experimental methodologies from cognitive psychology and applies these to second language processing and learning using laboratory-based methods. His recent research focuses on implicit learning of form-meaning connections (recently funded by the ESRC, http://www.esrc.ac.uk/my-esrc/grants/RES-000-22-3030/read), and incidental learning of word order regularities. He has published numerous articles on these topics in journals such as *Language Learning, Studies in Second Language Acquisition*, and *Applied Psycholinguistics* and is area editor of the *Cognitive Approaches to Second Language Acquisition* section of the *Encyclopedia of Applied Linguistics* (Wiley Blackwell).

Abstract

Extensive typological and generative work on case/agreement alignment in unrelated languages has revealed an intriguing asymmetry in this domain: whereas there are many languages with ergative case morphology on nominals and accusative verbal agreement, the inverse pattern is virtually unattested (Anderson 1977, Moravcsik 1978, Corbett 2006, Woolford 2006, Bobaljik 2008). There are various grammatical explanations for this asymmetry, all of which converge on the idea there is a basic "accusative bias" in natural languages, so that ergative agreement patterns are marked in some way. In the approach to alignment in Sheehan (2013), this results from the fact that accusative alignment is the default option, resulting from the absence of ergativity (formally the absence of a class of little 'v's assigning a theta-related case).

Given the inherent biases in the dataset of documented natural languages, however, typological asymmetries/gaps of this kind cannot be taken as certain evidence of a cognitive/grammatical bias. This is because such gaps may result from any number of contingent factors (including historical accident, language contact, ultimate shared ancestory). As such, the current study tests this asymmetry experimentally through an artificial language learning experiment.

The languages consist of English lexemes and invented morphological case/agreement markers which are manipulated in two distinct groups: Language C – the unattested ergative agreement/accusative case combination and Language D – the attested ergative case/ergative agreement pattern. All participants were monolingual English speakers, who are therefore familiar only with a weakly accusative system. The results from two experiments show that whilst both languages are ultimately equally learnable (or equally unlearnable) as assessed by measures of explicit knowledge, measures of implicit knowledge (such as changes in recall performance during learning) show a bias against language C, suggesting that this configuration is indeed harder to assimilate. Possible cognitive explanations of the results are considered and compared to a generative account.

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Unity and diversity of Turkic evidentials

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Elisabetta Ragagnin joins the Faculty of Asian and Middle Eastern Studies, University of Cambridge, from the Department of Turkology and Central Asian Studies, University of Göttingen, where she was Assistant Professor. She received her MA (*laurea*) degree in Persian, Arabic, Turkic and Altaic studies at the University of Venice and her PhD in Turkology at the University of Mainz. She has conducted intensive fieldwork across the Turkic-speaking world from Mongolia to Eastern Anatolia. She is author of *Dukhan, a Turkic variety of northern Mongolia, description and analysis* (Harrassowitz 2011). Her research interests include Turko-Mongolic and Turko-Iranian language contacts, Old and Middle Turkic, Azeri linguistics and Turkic phonological systems.

Abstract

Evidentiality is a morphologically marked category in Turkic languages. It can be realized both by inflectional markers and copula particles. Two examples are quoted below from the earliest Old Turkic sources (8th century AD).

Tabγač-garu	*qunï seŋün-üg*	*ïd-mis.*
China-DIR	Quni Seŋün-ACC	send-EVD

'He had evidently/apparently sent Quni Seŋün to China.'

Qaγan-ï	*alp*	*er-mis.*
khan-POSS3	brave	be-EVD

'His khan is/was apparently brave.'

Generally, terms expressively marked for evidentiality stand in paradigmatic contrast to non-evidentials. However, the types of evidentiality systems and their organization vary considerably across the Turkic languages both synchronically and diachronically.

Western Turkic languages tend to display two-term systems, where an indirective marker competes with a non-indirective one. On the other hand, Turkic languages of Central Asia display more comprehensive three-term systems, where an indirective past, a postterminal item, displaying perfect-like meanings with occasional indirective readings, and a direct past marker (unmarked for evidentiality) compete. Finally, more eastern Turkic languages display four-term systems, where evidential forms contrast with postterminals, non-evidentials and confirmatives. This paper will illustrate the semantic unity of Turkic evidentiality markers, the diversity of the language specific evidential systems, the way they have developed historically from earlier forms and their present-day distribution, drawing examples from various modern and older Turkic languages. The role of Turkic evidentiality in language contact situations will also be highlighted.

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Combining data and theory in lexical and compositional semantics

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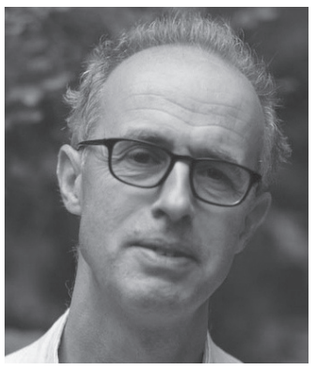
Abstract

In recent years, there have been impressive advances in the automatic acquisition of lexical content for individual words using distributional methods. Distributional methods hearken back to an older paradigm in linguistics – that of Bloomfield. However, it is difficult to interpret exactly what sort of content distributional methods provide, and even more difficult to say what sort of content issues from methods that have been developed to compose distributional meanings.

On the other hand, model theoretic or proof theoretic semantics (viz. type theoretic semantics) are very clear as to what sort of content they attempt to model and on compositional methods. In this paper, I look at some possible syntheses of the virtues of the worlds, reflecting on an old Kantian dictum reformulated for a more modern time – data without concepts are blind and concepts without data are empty.

Speaker's commitment and semantic commitment



Richard Holton

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Richard Holton takes up a professorship at Cambridge in Michaelmas 2013. Before that he was at MIT. He graduated from University College, Oxford in 1984, having read Philosophy, Politics and Economics. He was a graduate student at Nuffield College, Oxford (1984-5), and the École Normale Supérieure, Paris (1985-6), before starting a PhD in philosophy at Princeton (1986-1991). Although in recent years he has worked mainly on action theory and moral psychology, his doctoral dissertation was in the philosophy of language, and he continues to work in that area, more recently on factives.

Abstract

I want to think a little about how the ontological commitments of a semantic theory of a language reflect the semantic commitments of the speakers of that language. For Quine things were straightforward: the semantic commitments of the canonical formulation of the speaker's sentences were the commitments of the speaker. But as semantic theories have become more complicated, and have helped themselves to more resources, this approach looks less plausible, and the question of whether independent psychological evidence should be used becomes more pressing. I discuss with reference to some recent work on propositional attitude ascriptions.

Rethinking compositionality

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Kasia M. Jaszczolt is Professor of Linguistics and Philosophy of Language at the University of Cambridge and Professorial Fellow of Newnham College, Cambridge. She has published extensively on various topics in semantics, pragmatics and philosophy of language, including propositional attitude ascription, representation of time, semantics/pragmatics interface, her theory of Default Semantics, and ambiguity and underspecification. One of her current project concerns attitudes *de se* and first-person reference; the other is a theory of *Interactive Semantics* (in progress, OUP). Her authored books include *Representing Time* (2009, OUP), *Default Semantics* (2005, OUP), *Semantics and Pragmatics* (2002, Longman) and *Discourse, Beliefs and Intentions* (1999, Elsevier). She is General Editor of a book series *Oxford Studies of Time in Language and Thought* and serves on numerous editorial boards. She has written over 80 research articles and edited 11 volumes including *The Cambridge Handbook of Pragmatics* (2012, CUP). In 2012 she was elected member of Academia Europaea.

Abstract

The principle of compositionality, attributed to Frege, has created insurmountable problems such as (i) that of an adequate semantics of intensional constructions or (ii) accounting for the discrepancy between sentence meaning and the intended proposition. We present a radical contextualist proposal in which compositionality is predicated of the level of the merger of information that comes from different (linguistic and non-linguistic) sources. We illustrate the benefits of this "interactive compositionality" by applying it to the case of conditional constructions, demonstrating, with the help of examples from a corpus study, how the difficulties with delimiting the semantic category of conditionals can be overcome.

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Is formal semantics sufficient for computational linguistics?

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Stephen Clark is Reader in Natural Language Processing at the University of Cambridge Computer Laboratory. He has a PhD in Computer Science and Artificial Intelligence from the University of Sussex, and a Philosophy degree from Cambridge. Previously he was a University Lecturer in Computer Science at Oxford University. He works on a wide range of topics in Natural Language Processing, but his main research interest is syntactic and semantic analysis, with a focus on type-driven approaches (in particular Categorial Grammar) and the combination of symbolic and data-driven methods.

Abstract

Formal semantics has been an influential framework in philosophy and linguistics, but has fallen out of favour in computational linguistics (despite a recent move in the field back in the general direction of semantics). One of the shortcomings of formal semantics is that it does not naturally model semantic similarity, which is at the heart of many problems in computational linguistics. A relatively new and influential branch of computational semantics – commonly known as distributional semantics – naturally handles similarity, but fails in other areas, notably compositionality. In this talk I will describe some recent attempts to bring these two branches of semantics together, in which vector-based distributional models of word meanings have been given a compositional treatment, leading to vector-based representations at the phrase and sentence level.

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Denotations and distributions

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Ann Copestake is Professor of Computational Linguistics at the Computer Laboratory. Her research is in Computational Linguistics/Natural Language Processing - developing computer models of human languages (or, more precisely, models of some aspects of human languages). In conjunction with DELPH-IN, an informal international consortium, she has developed software which has been used to develop formal computational accounts of the syntax and compositional semantics of many different languages. Her current research mainly concerns the development of models of compositional and lexical semantics which are compatible with broad-coverage computational processing (parsing and generation). Since March 2013 she has been involved in the COST (European Cooperation in Science and Technology Framework) Action Project IC1207, *Parsing and multi-word expressions. Towards linguistic precision and computational efficiency in natural language processing (PARSEME)*. She has worked on a variety of application areas including scientific text processing, information extraction, augmentative and alternative communication (AAC), machine translation, Natural Language Interfaces, lexical acquisition and on tools for lexicographers.

Aurélie Herbelot studied literature and linguistics in France, completing a second undergraduate degree in Computer Science with the Open University in 2005. She followed this up with an MPhil and PhD in computational linguistics at the University of Cambridge. From 2011 to 2013, she was in receipt of an Alexander von Humboldt Fellowship at the University of Potsdam, Germany. Her work relates to both formal and lexical semantics. Her current research is an investigation of how traditional representations of quantifiers can be ported to a distributional semantics setting. She is generally interested in the philosophical and linguistic assumptions of distributionalism.

Abstract

There have recently been several attempts to relate distributional representations to model-theoretic semantics, which have various strengths and weaknesses. It is clear that standard distributional models do not model extension, and thus fail to provide an account of a range of phenomena standardly treated by formal semantics, such as quantification. Furthermore, distributional approaches do not fully model some standard concepts from lexical semantics, including antonymy. We argue that the distributional motto "Meaning comes from usage" cannot provide a full semantic representation without further qualification. We propose that distributional models should include a representation of the entities which are denoted by an utterance. We further argue that exposure to language use must be supplemented by a number of generalisation mechanisms in a process that leads to the formation of a speaker's linguistic competence. We will show that taking these aspects into consideration leads to distributional representations which are fully translatable into set-theoretic models, thereby reconciling "classical" formal semantics and distributional methods.

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Poster abstracts

1. What is the source of the multilingual's advantage in deriving pragmatic implicatures?

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: informativeness, scalar implicatures, executive control, bilingualism

Experimental evidence suggests that bilingualism has a beneficial effect for children's pragmatic and executive control development (e.g. Siegal et al. 2009). We aimed to investigate whether multilingualism confers an advantage

(1) in children's ability to use the maxim of informativeness to derive scalar implicatures (SIs)

(2) in children's working memory (WM) and task-switching abilities, and

(3) whether the former is mediated by the latter.

We tested 107 Chinese multilinguals (mean age 10.2) and 90 English monolinguals (mean age 9.6) aged between 8-12 years old. Multilinguals were bilectals in Mandarin Chinese and another Chinese dialect, also learning English as an additional language. The following tests were administered:

(1) Scalar Implicatures task: in critical items children heard a description (e.g. there are stars on some of the cards for a visual display where all of the cards have a star) which should be rejected if they interpret *some* to imply *not all*. In non-critical items children heard true-and-informative or patently false statements.

(2) the Corsi Blocks task for short-term and working memory (WM)

(3) the Colour-Shape task for task-switching

(4) the TROG (Test for Reception of Grammar) for grammatical knowledge. Multilinguals received the SI task and TROG in both Mandarin Chinese and English.

Monolinguals had a higher score in the English TROG (r(two-tailed)=.596, $p<.001$) and the non-critical items of the English SIs test (r(two-tailed)=.680, $p<.001$). Multilinguals, however, were significantly older than monolinguals (r(two-tailed)=-.210, $p<.05$). ANOVAs (Analysis of Variance) with age, TROG (Mandarin or English) and score in non-critical items of SI test (Mandarin or English) as covariates showed that multilinguals outperformed monolinguals

(1) in deriving SIs (in both Mandarin ($F(1, 148)=15.221$, $p<.005$) and English $F(1, 152)=6.347$))

(2) in WM ($F(1, 111)=12.201$, $p<.005$).

Regression analyses within the multilingual group revealed no significant correlations between age of onset, degree of use, or years of exposure to dialect or English and performance in the SIs (English or Mandarin) and the working memory tests. Furthermore, no significant correlations between working memory or task-switching and children's performance in the SI test (English or Mandarin) were established.

Overall, multilingual children were more advanced than monolinguals in deriving SIs (in both languages tested) and in their working memory abilities. However, none of these advantages were related to aspects of their experience of a second dialect or language. We discuss whether these advantages might be due to cultural factors.

2. The effect of bilectalism on children's vocabulary and executive control skills

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: bilingualism, bilectalism, executive control, vocabulary

Experimental evidence suggests that, while bilingualism has a negative effect on some aspects of children's linguistic performance (e.g. vocabulary), it has a beneficial effect for their executive control (EC) abilities (Bialystok 2009). In this study we aimed to investigate whether bilectalism has a similar effect

on children's language and EC skills. We use the term bilectalism to describe the linguistic situation in Cyprus where children typically grow up speaking two different varieties of the same language: Cypriot-Greek (CG) and Standard Modern Greek (SMG).

62 bilectals in CG and SMG (ages 5-12, mean age 7.7), 46 multilinguals (ages 5-12, mean age 7.8) in CG, SMG and another language, and 25 monolinguals, speakers of SMG (ages 6-9, mean age 7.4) were administered the following Executive Control tasks:

(1) the Backward Digit Span and the Corsi blocks tasks for working memory

(2) the Simon and a Stop-Signal task for inhibitory control

(3) the Colour-Shape task for task-switching

(4) an IQ test

(5) a vocabulary test.

First, we focused on the comparison between bilectal and multilingual children: multilinguals possessed a smaller vocabulary than bilectals (r(one-tailed)=-.552, $p<0.001$) and multilinguals were of a higher socio-economic status than bilectals (r (two-tailed) =.412, $p=0.001$). ANOVAs with vocabulary and socio-economic status as covariates showed that the two groups did not differ for any of the measures from the Executive Control tests. Second, we directly compared the performance of the three groups: the three groups were matched for age, however, they differed for vocabulary and socio-economic status ($F(2, 89) =35.531$, $p<0.001$ and $F(2, 89)=8.542$, $p<.001$ respectively). Post-hoc tests with Bonferroni correction showed that multilinguals had a lower vocabulary than bilectals and bilectals had a lower vocabulary than monolinguals (both $ps>.005$). ANOVAS with vocabulary and socio-economic status as covariates showed that the three groups differed only for a measure from the Color-Shape task ($F(2, 87)=4.081$, $p<.05$). Post hoc tests with Bonferroni correction showed that bilectals had a significantly smaller switching cost than monolinguals ($p<.005$). Multilinguals, on the other hand were only marginally better than monolinguals ($p=.108$). Multilinguals and bilectals did not differ from each other.

Overall, we found no significant differences between multilinguals and bilectals for any of the Executive Control measures used. Bilectals (and multilinguals, but only marginally so) were significantly better than monolinguals in a measure of task-switching. Bilectals also showed the typical deficit in their vocabulary skills when compared to monolinguals.

3. Exploring academic literacy: preliminary insights from the Cambridge Corpus of Academic English

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: academic literacy, corpora, EAP

Being literate in English is often the expectation in academia today. In many countries, education at all levels is delivered partially or totally through the medium of English, with an increasing proportion of academic outcomes being produced in English. Our research focus is to explore what *academic literacy* means for native and non-native users of English and their instructors, in order to identify how success in academia interacts with an individual's language background, their general level of language proficiency and their understanding and use of core and field-specific academic conventions. Developing a robust construct of academic literacy will help all of those involved in English language education and higher education to develop a better understanding of the language skills required to operate successfully through the medium of English in academia.

Two departments of Cambridge University, Cambridge English Language Assessment and Cambridge University Press, have recently completed the pilot phase of this study, in which we designed the Cambridge Corpus of Academic English (CAMCAE) and undertook the preliminary analysis of this collection of academic writing gathered from various academic levels, disciplines and first language backgrounds. The written data collected includes a wide range of text types from essays and reports through to research theses and journal articles.

The corpus currently contains around 2 million words from different institutions that have a stake in academia, including sixth forms and various universities. The analysis of this data through corpus linguistic techniques will enable us to identify specific features of academic English across these parameters, facilitating the development of better teaching materials and assessment tools, and broadening our understanding of how English is used across a range of academic levels and settings.

One of the research objectives underlying our study of academic literacy – and this corpus development – is to define what academics and other stakeholders in education – sixth form and university students, their teachers, admissions tutors and so on – understand by the term "academic literacy", so that better teaching towards this goal and assessment of education outcomes relating to academic literacy can result.

In this poster we will present an overview of how CAMCAE is being collected, the analytical techniques used to-date and preliminary insights relevant to learning and assessment, situated within our developing concept of academic literacy.

4. Semantic transparency and the internal semantic structure of compounds

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Theme: Philosophy of language meets computational linguistics

Keywords: compound, semantic transparency

A concern of the philosophy of language is the extent to which meaning arises from the internal structure of linguistic expressions, or is determined contextually. For compound nouns, this involves the meaning relation between the constituent words, which is not overtly expressed. It is unclear, for example, whether there is a finite set of possible relations, or a single underspecified relation, and what contribution, if any, the relation makes to the degree of semantic transparency of a compound. We address this question by presenting models of compound transparency showing that both the distributions of the constituent words and the internal semantic structure of a compound contribute to its overall transparency.

We use the publicly available dataset of Reddy et al. (2011). For a set of 90 English compound nouns, these authors obtained human ratings of literality for the compound and each constituent within it. We coded the same dataset for the semantic relation between the constituents and whether either constituent or the compound as a whole had been metaphorically shifted. We also added various frequency measures from the British National Corpus. The frequency and semantic variables were used as predictors in ordinary least squares regression analyses with literality of the compound or its constituents as the dependent variables.

Both frequency-based and semantic variables are found to be statistically significant predictors of compound literality. Literality increases as either constituent becomes more predictable and falls with increasing lexicalisation. Literality is also lower when either constituent, or the whole compound, is metaphorical. Most significantly, certain semantic relations (FOR and IN) are associated with greater literality. On the assumption that literality is a measure of semantic transparency, this is the first evidence that the relation between constituents, as well as the semantics of the constituents themselves, contributes to transparency. However, further investigation reveals that the FOR relation (e.g. *swimming pool*) is associated with transparency of the second constituent, while the locative IN relation (e.g. *ground floor*) is associated with transparency of the first constituent. These results, taken together, suggest that the interpretation of the semantic relation in compounds arises at least partly from the lexical semantics of the constituents and their patterns of distribution in the lexicon.

5. What's universal about Universal Grammar? Deeper layers of variation

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Theme: Diversity and universals

Keywords: variation, linguistics genotype, language disorders, externalization

Current psycholinguistic, neurobiological and genetic research revealed a greater degree of variation regarding language than was previously thought (Kos et al. 2012; Le Floch et al. 2012). In particular, it seems to cast doubt on the purportedly homogeneous nature of the language faculty. For instance, at the brain level the boundaries of the "language areas" are rather changeable among individuals, but also across development. Moreover, the many genes contributing to the emergence of the language capacity are highly polymorphic, with some variants giving rise to pathological conditions, but with others being present as well within the unaffected population. This seems to challenge the longstanding assumption that the *linguistic genotype* is going to be uniform across the species in the absence of a fairly severe and specific pathology (Anderson & Lightfoot 1999).

In this presentation we discuss whether (and to what extent) this genetic diversity can actually be reconciled with the widespread view of the faculty of language as "one component of the human mind" — in essence, as an idiosyncratic cognitive capacity/entity/ability, which is qualitatively equal in all human beings. To address this challenge, we explore the implications of some recent hypotheses posited by evolutionary developmental biology. In particular, we argue that developmental dynamics (and hence, an assorted set of regulatory factors) strongly canalizes variation, to the extent that the same phenotype can robustly emerge at the term of growth from diverse genotypes. We also argue that language disorders can be construed as conditions for which canalization has been unable to achieve particular degrees of development. We stress that breakdowns do not occur randomly, because adaptability is always constrained, and advance the hypothesis that certain cognitive processes are more vulnerable than others to damage or to developmental disturbances. We highlight the need to apply tools used in comparative linguistics to identify the loci of biolinguistic variation, and conclude that such layers may be confined to externalization process.

6. Zipf's law and the grammar of languages: synthetic and analytic encoding strategies across languages of the world

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Theme: Philosophy of language meets computational linguistics

Keywords: Zipf's law, language syntheticity, quantitative typology, language change, language evolution

Zipf's law denotes one of the most well-known quantitative relationships in language. It describes the ranking of words according to their frequencies of occurrence. However, it is widely held to be linguistically "shallow" and is ignored by historical and typological linguists. This poster will present evidence that Zipf distributions for parallel texts differ systematically. The variation seems to be due to differing grammatical encoding strategies of the respective languages. This observation could help to rate languages on a quantitative scale.

To assess whether Zipf distributions can be used for cross-linguistic comparisons, we compared the shapes of distributions for parallel texts of the Universal Declaration of Human Rights (UDHR). Overall, we have calculated empirical rank-frequency profiles (ranking the words of a text according to their frequency of occurrence) for 369 languages (rank-frequency profiles can only be calculated for languages which delimit words by white-spaces, which rules out some writing systems).

Analytic languages tend to have more high frequent items than synthetic languages. This is because analytic languages have a higher rate of repetition of the same words than synthetic languages (e.g. *the* in English versus *der*, *die*, *das*, *dem*, *den* in German). If this holds, then higher analyticity should be reflected in the shape of Zipf distributions for specific languages (everything else being equal). Indeed, this effect can be shown for the languages of the Universal Declaration of Human Rights.

Overall, the research on Zipf distributions so far suggests that, indeed, they are by no means "linguistically shallow", but rather reflect the state of syntheticity of languages. It needs to be assessed in future research whether this is a stable effect across languages of the world.

7. How the human brain exchanges information across sensory modalities to recognize other people

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: voice recognition, cross-modal person recognition, functional magnetic resonance imaging

Recognizing the identity of other individuals across different sensory modalities is critical for successful social interaction of many species [1-5]. For example, monkeys, horses, crows, and human infants preferentially look at the correct face identity when they hear the voice of a familiar conspecific [2, 3, 5, 6]. How is this so-called cross-modal individual recognition implemented in the brain?

There are separate areas for recognition of faces and

voices in the monkey and human brain [7-10] and these areas are structurally connected [11-13]. Two mechanisms for face recognition have been proposed: identification of the entire face (holistic recognition) and identification of local physical properties, like the shape of eyes (part-based recognition) [14]. Here, we test what kind of information about the face is derived from the voice during cross-modal recognition: a) holistic information only or b) part-based information, in addition to holistic information. We used functional magnetic resonance imaging in humans and a voice-face priming design in which familiar voices were followed by morphed faces that matched or mismatched with respect to identity or physical properties.

We found different activity and connectivity profiles within different face-sensitive areas: (1) The occipital face area received information about both physical properties and identity, (2) the fusiform face area received predominantly identity, and (3) the anterior temporal lobe received exclusively identity information from the voice. These results are congruent with a predictive coding scheme where both holistic and part-based information is used across sensory modalities to accomplish fast and robust recognition of individuals.

8. Characterizing the language-ready brain

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: thalamus, globularization, communicative brain, language-ready brain, evolution

In this presentation I depart from the emphasis on lateralization to characterize the language-ready brain, and stress the importance of another, more sapiens-specific property of the brain to understand our language faculty.

Paleoneurology has established that certain characteristics, such as the globularization of the brain and the enlargement of the parietal lobes can be considered derived features observed uniquely in anatomically modern Homo sapiens. At the same time, comparative psychology has established that humans are particularly good – much better than other species – at unifying and combining units that belong to distinct conceptual modules/core knowledge systems. Evidence suggests that language is critical in achieving these cross-modular conceptual patterns.

Departing from the emphasis on cortical regions in neurolinguistics, I argue, building on work on findings concerning attention and working memory, that the linguistic role of the thalamus is needed to understand this function of language. Although the thalamus has been implicated in the context of many human-specific traits like intelligence of consciousness, its role in language has not been fully exploited. Yet there are several reasons to be optimistic regarding the cognitive relevance of this brain structure. First, at the raw anatomical level, the thalamus acts as a necessary relay center to connect many brain structures that have already been implicated in research on language: the cortical areas with the basal ganglia and with the cerebellum. Second, the literature on the FOXP2 gene and its interactome has often mentioned the thalamus as an important expression site of the genes involved. Third, despite the cortical focus of many imaging studies and the technical difficulties in getting recordings from the thalamus, this brain structure's role has been highlighted in neurolinguistic studies. Finally, outside of language proper, the thalamus has routinely been assigned a key role in controlling attention, regulating oscillations generated in the cortex, etc. – functions that, though not specific to language, must surely also be part of a comprehensive neural characterization of language.

Given its central location and pivotal relay function, the thalamus may have benefited from the sapiens-specific globular brain environment, giving rise to our species' distinct cognitive profile. I back up this possibility by using data from various sources (from linguistics to (paleo)genetics), and conclude by claiming that while globularity lies at the heart of our brain's language-readiness, lateralization may well lie at the heart of our communicative brain (in the sense of Marslen-Wilson).

9. Universals and Universal Grammar: a view from variation

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Theme: Diversity and universals

Keywords: parameters, variation, Universal Grammar

The present work discusses the nature of macroparametric variation and its predicted parametric hierarchies through implementing a novel program-based analysis to 63 DP parameters (identified in Longobardi & Guardiano 2009) in order to pinpoint relations of parameter setting across 23 contemporary and 5 ancient languages. Our findings suggest that what is frequently entertained as Universal Grammar (UG) -encoded, "syntactic" variation, should be instead approached as the by-product of externalization processes. If parametric variation is not part of UG, then the patterns that one observes in the environment (either absolute universals or implicational universals) cannot inform a theory of UG.

One might be able to articulate statistical tendencies, however there are serious issues to be taken into consideration when one attempts to interpret these tendencies as carrying implications for UG. For instance,

(1) how many languages are there on the planet and how are languages defined in relation to dialects and idiolects?

(2) the issue of underdocumentation (de Vries 2005) or even the impossibility of documentation if idiolects enter the equation

(3) observed languages do not reflect the full potential of the human language faculty and UG (de Vries 2005). More importantly, even if indeed the environment reflects UG-specified principles, in the absence of UG-specified parameters, it is theoretically and empirically unmotivated to approach the environmental diversity (and its limits, the absolute universals) in terms of these being UG-specified primitives.

To demonstrate the inadequacy of observed diversity to reflect what is encoded in UG, today there are very few languages which show a positive setting of both the Direction of Agreement parameter and the Case Dependency of Agreement parameter. According to Baker (2010) there is just one (i.e. Kapampangan). If this is really a language that manifests a combination of properties that is not found in any other language, then upon its extinction, a part of "the space of possibilities" would become invisible, and linguists focusing on universals would immediately fail to grasp the full range of possibilities that the human language faculty makes available.

10. The role of the environment in the evolution of the language faculty

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: environment, design characteristics, syntactic protolanguage

In the protolanguage literature, one finds references to musical, gestural, and lexical protolanguage hypotheses (see Fitch 2010 for review), but there is nothing like what, in the present work, we put forth as "syntactic protolanguage". Positing a syntactic protolanguage does not cast any doubt on the other notions of protolanguage that are proposed in the literature: there could be stages in the course of language evolution that would correspond to different kinds of "protolanguage", but we argue that the notion of "syntactic protolanguage" allows us to make sense of well-established findings in the evolution literature. More specifically, if the course of evolution is mapped to a complexity continuum that has some kind of protolanguage on the one end and fully modern language on the other, the emergence of anatomically modern humans circa 150,000 B.P. could correspond to a crucial threshold on the evolutionary continuum. More specifically, it would correspond to the emergence of syntactic protolanguage: a pure Merge-based system without lexical influence.

The next crucial point to be pinpointed in the evolutionary continuum is the subsequent major demographic expansion that the fossil record places within the time range from 80,000 to 60,000 B.P. This expansion coincided with a major increase in the complexity of the socio-cognitive behaviour of modern humans (Mellars 2006), which amounts, in linguistic terms, to the emergence of a fully-fledged modern language, if proposals like that of Wray and Grace (2007) are correct.

We argue that between these two crucial points, an interaction of genetic and environmental factors led to the emergence of certain linguistic principles such as duality of patterning, rule-based morphophonology, complex grammatical markers and surface ("parametric") variation. Prior to this expansion, we claim, the language-ready brain of anatomically modern humans lacks an adequate degree of environmental stimulation for these properties to emerge. Our argument makes predictions that we argue are confirmed in languages like Al-Sayyid Bedouin Sign Language, Riau Indonesian, and Pirahã.

11. Characterizing the nature and timing of syntactic computations in the fronto-temporal language network using representational similarity analysis

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: syntactic processing, sentence processing, multi-voxel pattern analysis, magnetoencephalography (MEG), verb subcategorization

The core human capacity of syntactic analysis involves a left hemisphere network that includes left inferior frontal gyrus (LIFG) and posterior middle temporal gyrus (LMTG) and the anatomical connections between them (Parker et al. 2005; Tyler et al. 2011). This system must accommodate and resolve the temporary syntactic ambiguities that arise in sentence processing as a consequence of the temporal nature of the speech signal. Here we use magnetoencephalography (MEG) to determine the spatio-temporal properties of syntactic computations in this network as participants listened to spoken sentences.

Listeners heard sentences containing syntactically ambiguous phrases, where a verb participle could function either as an adjective (e.g. "... *landing planes* are ...") or a gerund ("... *landing planes* is"). At the offset of the phrase participants heard a disambiguating verb (is/are) and decided whether it was an acceptable/unacceptable continuation of the sentence. We charted the time-course of processing and resolving syntactic ambiguity by measuring MEG responses from the onset of each word in the ambiguous phrase and the disambiguating word. We used representational similarity analysis (RSA) to characterize syntactic information represented in the LIFG and left posterior middle temporal gyrus (LpMTG) over time and to investigate their relationship to each other. Several dissimilarity models coded for the presence of ambiguity in the sentences, and the preferences associated with the possible resolutions of ambiguous phrases. Another model encoded lexico-syntactic information associated with the verb participle, derived from verb subcategorization frame distributions in the VALEX lexicon (Korhonen et al. 2006).

Testing these models against the MEG data, we found early lexico-syntactic responses in the LpMTG and later effects of ambiguity and its resolution in the LIFG, pointing to a clear differentiation in the functional roles of these two regions. Our results suggest that the LpMTG represents and transmits lexical information to the LIFG, which responds to and resolves the ambiguity.

12. A cognitive diagnosis interpretation of the CEFR construct of language competence

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: CEFR, cognitive diagnosis assessment, communicative competence, languages, language ability

The Common European Framework of Reference for Languages (CEFR) construct of language ability is based on language usage, underlined by "communicative competences", i.e. the fact that language competence does not just include language knowledge, but also the "the way this knowledge is stored and its accessibility" (CEFR, p.13).

The aim of this study is to investigate the cognitive interpretation of communicative competence and how this could improve task design in the future. It could also provide some feedback on how competences are not only being successfully marked but also used as an example of cognitive analysis. As an element of a task's demands, task purposes underline cognitive loads of language performance (Weir 2005).

We would like to answer two main questions:

1. Which task designs can provide ground for cognitive analysis? Is it only by following the CEFR that it is possible to measure the competence and knowledge of the test taker?

2. What is the difference between tasks created by following and not following the CEFR construct?

Methodology

The CEFR list of language competence profiles consists of 12 elements; 6 for linguistic competences, 4 for sociolinguistic competences and 2 for pragmatic competences. We took expert advice in order to reduce the number of elements to 6. Q-matrix was developed

with these 6 attributes (A1-lexical competence, A2-grammatical competence, A3-semantic competence, A4-discourse competence, A5 - functional competence and A6 - strategic competences) and 49 language items.

Psychometric model
The study is based on Least Squares Distance Model-Conjunctive (LCDM-C) following the concepts of IRT item modelling (Dimitrov & Atanasov, 2012). As a measure of the level of matching between the theoretical model and the observed item performance we used MAD (mean absolute difference) index for the Item Characteristic Curve and the probability for the correct attribute performance - Attribute Characteristic Curve (ACC).

Results
Except for attribute A5 - functional competence, ACCs increase with the increase of the ability of the logic scale.

In cases where the tasks are not originally designed to fit the CEFR construct they do not provide any functional value of competence, whereas the framework does allow competences such as lexical, grammatical, semantic, discourse and strategic to be estimated within the descriptors. The task can be used for cognitive purposes only if it is based on the CEFR and could be analysed by the same framework.

The functional competence makes a difference. We claim that this difference could be explained in a combination of CEFR construct of language ability and task design. We conclude that a CEFR taxonomy of authentic task purposes could be applied for cognitive diagnosis interpretation of pragmatic competence.

13. Syntax at the interface between a musical performer and instrument

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Theme: Diversity and universals

Keywords: Syntax, embodiment, music, technical interface, motor planning

Music theorists have applied the concept of syntax to musical structure and suggest language and music share syntactical resources (Fedorenko et al., 2009; Koelsch, 2005; Patel, 2003; Slevc et al., 2009). This study explores the use of the term as it might apply to musical instrument design. How does the interface between a performer and an instrument afford the ability to sequence movements appropriately in order to produce music?

Two instances of this interface are explored. The first is the case of the monome, an electronic 8x8 button box (see Dunne 2007 for technical specifications). Each button can be programmed to produce or alter a sound. The monome can be programmed differently for each player, and for each performance. This gives the performer the ability to shape the human-instrument interface, and, in effect, design a technique. When programmed with single sounds corresponding to single buttons, the monome can be seen as a physical artefact of a given performer's desired organization of different elements of music, shaped to fit with the performer's intended sequencing of movements.

The second case is that of the piano. While formal music-theoretical rules may hold between key signatures (like Bb Major or B Major), the ability to follow them technically is not symmetrical because of their different physical key layouts on the keyboard. Some key signatures are less familiar and ergonomically more challenging to pianists (see Parncutt et al., 1997 for a model of keyboard fingering). When playing compositions, performers have time to practice and overcome these differences, but during improvisation, performers must play what is playable at the moment. Key layout thus shapes not only how movements are executed, but also which ones are chosen at all.

These two cases are discussed with respect to musical structure and syntactical ordering of movements.

14. The spatio-temporal brain dynamics of visual word recognition

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: psycholinguistics, electroencephalography (EEG), magnetoencephalography (MEG), reading, time course

Time course information is essential to test models of visual word recognition, e.g. with respect to serial

versus parallel processing or top-down modulation of early word recognition processes. Behavioural methodology and metabolic neuroimaging (e.g. fMRI and PET) provide only indirect evidence for the relative timing of perceptual and cognitive processes. Electro- and magnetoencephalography (EEG/MEG) are to date the only non-invasive neuroimaging tools that allow the on-line monitoring of brain activity. I will present recent EEG/MEG evidence on the spatio-temporal brain dynamics of visual word recognition, and discuss its implications for models of word recognition.

The earliest behavioural responses (such as button presses in a lexical decision task) that are sensitive to lexical and semantic variables occur in the latency range of 300-400 ms [1]. The corresponding brain processes must occur at least 100 ms beforehand. This has been confirmed in ERP and combined EEG/MEG experiments [1,2]. ERP studies that investigated the modulation of brain responses by several psycholinguistic variables showed a sequence of effects for orthographic, lexical and semantic variables within about 200 ms of stimulus presentation [3-5]. Brain activity estimated from combined EEG/MEG data showed a progression from occipital areas around 100 ms to anterior temporal lobe (ATL) around 250 ms, and activity in ATL was modulated by semantic variables.

Recent studies have shown that task demands modulate word processing at earliest stages of processing. For general word processing, differences in brain activity in temporal lobe started around 150 ms [7]. For specific psycholinguistic variables, task effects occurred already around 100 ms for orthographic and around 150 ms for lexical variables.

Taken together, the evidence suggests a fast cascaded processing sequence along the left temporal lobe within 200-250 ms of word presentation. These processes may be subserved by ventral stream areas involved in general object recognition. The sequence culminates in anterior temporal lobe, which – consistent with the presented data – has been assigned the role of a "semantic hub" [8]. Early word recognition processes are already penetrated by task demands, suggesting that word recognition is best described as flexible rather than automatic.

15. Rhythmic entrainment of pulse and accent in spontaneous music-making and conversation

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: interaction, spontaneous, speech and music, rhythmic entrainment

The hypothesis is explored that when interactants improvise music successfully together, they entrain such that spontaneous spoken and musical pulses are mutually supportive: more closely aligned in time than when the music is less successful. Five same-sex pairs of friends, three musician pairs (one female) and two non-musician pairs (one female) were recorded audio-visually (4 cameras, 5 microphones) for 10 minutes while improvising music on unfamiliar instruments, during longer recording sessions which involved no music-making. Talk during music-making was unscripted and intermittent. 47 bouts of music in which there was also talking before, during or after, were extracted and classified by listening in terms of whether the music was successful (27), unsuccessful (15), or breaking down in a disorderly way (5). Successful bouts produced a strong sense of musical pulse maintained by both players; unsuccessful bouts still produced a sense of pulse, but less securely. Mean pulse intervals were similar for successful and unsuccessful musical bouts, but variation within unsuccessful bouts was about twice that within successful bouts, validating subjective classifications. Crucially, f0 maxima/minima ("pikes") in accented syllables occurred significantly closer to musical pulse onsets in successful compared with unsuccessful music: while the majority of pikes were offset from pulse onsets by 20-30% in both successful and unsuccessful conditions, the distribution of pulse-to-pike offsets was skewed towards smaller values in successful music, and more normally distributed in unsuccessful music. These results support the hypothesis that interactants entrain with one another such that spoken pikes and musical pulses are more closely aligned temporally when they make music together successfully compared with when their attempts to play together are unsuccessful. When such temporally aligned speech precedes a successful musical bout, it seems to seed the musical pulse so that players can start to play synchronously at the same tempo without overt negotiation.

16. The illusion of unagreement: a unified structure for DPs, pronouns and "pro"

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Theme: Diversity and universals

Keywords: nominal structure, unagreement, pronouns, null arguments

Unagreement (Hurtado 1985) describes a phenomenon observed in certain null subject languages (e.g. Spanish, Modern Greek, Bulgarian), involving an **apparent agreement mismatch** between a third person plural subject DP and first or second person plural subject agreement on the verb (1), cf. Ackema & Neeleman (in prep.) among others. Certain other null subject languages like Italian and European Portuguese do not allow this construction (2).

(1) I fitites ftiaksame ena oreo keik. (Greek)
the students made.1pl a good cake
"We students baked a good cake."

(2) *Gli studenti abbiamo fatto una torta. (Italian)
the students have.1pl made a cake

In languages with articles, the **definite article is obligatory** in adnominal pronoun constructions (APCs; "we linguists") in langages with unagreement, while non-unagreement languages **proscribe the article** in APCs (3).

(3) a. *Unagreement*

emis i fitites	(Greek)
nosotros los estudiantes	(Spanish)
nie studenti-te	(Bulgarian)
we the students	

b. *No unagreement*

noi (*gli) studenti	(Italian)
nós (*os) estudantes	(European Portuguese)
we students	

Adopting a pronominal determiner analysis for the APCs in (2b) (Postal 1969) and Panagiotidis' (2002) analysis of pronouns as involving a silent noun $e_{N'}$, I suggest that **the cross-linguistic variation in the availability of unagreement results from a difference in the structure of the extended nominal projection** (xnP). Unagreement is available when person and definiteness features are hosted on separate heads in xnP (4). Non-unagreement languages have regular pronominal determiners encoding definiteness and person on a single head (5).

(4) [PersP Pers [DP D [NumP Num NP]]](unagreement)

(5) [D_{pers}P D_{pers} [NumP Num NP]] (no unagreement)

Unagreement results from non-realization of Pers in (4) as illustrated in (6). Non-realization of D_{pers} in (5) would not result in the characteristic definite plural DP subject, but in a bare noun. There seems to be an independent constraint in both kinds of languages that a definite D cannot be silent if there is overt material in NumP (i.e. silent D only in pronouns and "*pro*"). Therefore, the head encoding person and definiteness in (5), D_{pers}, cannot be silent with overt material in NumP, cf. (7). The cross-linguistic variation results from the interaction of the structural difference and the conditions on D-realization. This variation seems to divide Longobardi's (2008) class of strong Person languages. Finally, "radical pro-drop" languages (e.g. Mandarin) are, apparently correctly, predicted to have no APCs due to the lack of syntactically active person features.

(6)

	overt Pers	**silent Pers**
overt NumP	APC	unagreeing DP
silent NumP (e_N)	pronoun	"*pro*"

(7)

	overt D_{pers}	**silent D_{pers}**
overt NumP	APC/ "full" DP	---
silent NumP (e_N)	pronoun	"*pro*"

17. Morphological processing in a minimally inflected language: evidence from Mandarin Chinese

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: morphology, Mandarin Chinese, MEG, compounding, inflection, derivation

Previous research in English and Polish provides evidence that two distinct but partially overlapping networks underlie spoken word processing. Morphological inflections, an assumed hallmark of human language, mainly engage a left-lateralized frontal-temporal network linking inferior frontal and posterior temporal regions; non-inflected simple words and derived words are supported by a more widely distributed bilateral fronto-temporal network (Bozic et al. 2010; Szlachta et al, 2012). The aim of this study is to examine the possible role of these two networks in a minimally inflected language, Mandarin Chinese. Native speakers of Mandarin passively listened to three types of disyllabic Mandarin words, where the second syllable contrasted different types of morphological complexity (simple compound words (hu shi "to breathe"), derived words (jing hua "purify") , and inflected words (chang zhe "singing"), while combined electro- and magneto-encephalography (EMEG) data were recorded. This allows us to track the transient real-time morphological computations underlying the three types of complexity. The alignment point was set to the onset of the second syllable, where information about word type and complexity becomes available. Minimum Norm Estimate (MNE) techniques were used to compute whole-brain source estimates. Early results suggest that derived words elicit more activation than inflected words in the bilateral fronto-temporal network at early time-windows, while inflected words preferentially activate left hemisphere frontal and temporal ROIs at a later time-window. This is preliminary evidence that, despite the reduced role of grammatical morphological combination in Mandarin, a similar functional differentiation can be observed in the underlying neurobiological systems.

18. Evaluating the compositionality of multi-word expressions using nearest neighbours in vector space models

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Theme: Philosophy of language meets computational linguistics

Keywords: Natural Language Processing, distributional semantics, compositionality

We present a novel unsupervized approach to detecting the compositionality of multiword expressions. The work relies on a formalization of an intuitive test for compositionality—namely, that "kick the bucket" is non-compositional because "kick the pan" is semantically anomalous, while "eat the apple" is compositional because "eat the pear" is perfectly fine. This notion is formalized in mathematical models for representing the meaning of lexical items as vectors in a "semantic space", so-called vector space models. Vector space models have the benefit that they can easily be manipulated via linear algebra, allowing us to compute a continuous degree of similarity between vectors. Recent developments allow us to build composed phrase vectors from the individual constituent words, so that we can directly compare the two vectors for "eat apple" and "eat pear", for example.

The compositionality of a phrase is computed through substituting the constituent words with their "neighbours" in a semantic vector space and averaging over the distance between the original phrase and the substituted neighbour phrases. Two methods for obtaining these neighbours are presented: directly from vector space models, or by getting the hyponyms of hypernyms in WordNet and using these siblings as neighbours. The results are compared to existing results and achieve state-of-the-art performance on a verb-object dataset of human compositionality ratings in a direct comparison with supervized methods that require complex feature sets and support vector machines.

19. Neural interfaces between morphology and syntax: evidence from Russian inflectional morphology

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: morphosyntax, Russian, fMRI, syntax, inflection, derivation

Functional and structural separation of the dorsal and ventral language streams has been supported by extensive developmental, neuroimaging and neuropsychological evidence. Processing of hierarchical syntactic structures has been associated with BA 44 and pSTG (dorsal route), and simple unification syntax with BA 45 and aSTG (ventral route) (Friederici et al., 2011). At the word level, LIFG activation (centred around BA 45) has been linked to processing of grammatical inflection (Bozic and Marslen-Wilson 2010). It is unclear, however, whether this is driven by surface form decomposition and subsequent unification of the stem and affix (Hagoort, 2005) or by processing of the syntactic structure expressed through the inflectional suffixes

To address these questions (in an fMRI experiment using sparse imaging methods) we compared the activation patterns for inflected Russian words with those of short phrases that convey the same syntactic information. Complex conditions represented hierarchical syntax – the Russian participle "those who read" is realised either as a phrase "te kto chitaut" or as a verb inflection "chitaushie". These were contrasted with simple conditions that required only linear unification syntax - phrases like "chitat xorosho" to *read well* and inflectional forms like the verb infinitive "chitat" to *read*. We asked whether inflectionally and phrasally coded syntactic structure elicits similar distributions of LIFG activation. To control for morphological complexity we also included simple ("prikaz" *an order*) and complex ("perevozshik" *delivery man*) derived words. Both phrasal and inflectional conditions elicited strong activation in bilateral temporal STG and MTG, and in left BA 47, 45, and 44. No overall differences were found for the simple/complex contrasts, designed to contrast hierarchical and linear syntax, although simple syntax, complex inflection and syntax differed in STG and STS bilaterally. Derivation produced no LIFG activation. Additionally RIFG (BA45) activation not predicted by existing frameworks was observed for complex syntactic items. In summary, these preliminary results do not support a ventral/dorsal distinction for syntactically complex versus simple processing in Russian phrases and inflected forms.

20. Spatiotemporal dynamics of syntactic reanalysis in the frontotemporal network.

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Theme: Philosophy of language meets computational linguistics

Keywords: syntax, syntactic processing, language, reanalysis, MEG

Neuroimaging studies have shown that syntactic analysis is instantiated in a left frontotemporal network consisting of LIFG, LpMTG, and white matter tracts connecting them (Tyler et al., 2011). While comprehending spoken language we construct syntactic representations as the speech is heard (Marslen-Wilson & Tyler 1980). This online syntactic processing sometimes involves resolving ambiguity if the sentence structure contains multiple syntactic readings. The aim of this study was to investigate how syntactic ambiguity is resolved over time and the frequency dynamics underpinning it.

Subjects were presented with spoken sentences containing either a syntactically ambiguous or unambiguous phrase. When ambiguous, a verb participle could be read as an adjective (e.g. "... *landing planes* are ...") or a gerund ("... *landing planes* is..."). This ambiguity can only be resolved after the disambiguating verb (i.e. is/are) is heard. We predicted that for ambiguous sentences, multiple possible interpretations are activated, but subjects will have a higher preference for the most expected continuation, the dominant meaning (DOM), while suppressing other readings. However, if the prediction is wrong, as in subordinate (SUB) continuations, then reanalysis will be initiated where the suppressed reading is re-activated and the sentence structure is recomputed. In this manner, syntactic ambiguity is resolved.

Continuous magnetoencephalography (MEG) data were recorded as subjects passively listened to the sentences. After reconstructing the cortical sources from the MEG signals, we analysed the oscillatory modulations across time and frequency. Regions of interest were functionally defined based on a previous fMRI study using the same paradigm. The study

revealed increased activity in LIFG and LpMTG in SUB-DOM contrast. In order to test for bilateral activity their right hemisphere homologues were also specified. Epochs were set to -200 to 1000 ms period from the onset of the disambiguating verb. Time-frequency representations were computed over the whole epoch and power was averaged within frequency bands.

The SUB-DOM contrast revealed higher alpha, beta and gamma band activity in LIFG in an early time window (115-435 ms) followed by a later theta band effect in LpMTG (440-740 ms). This was followed by a late beta band effect in LIFG (765-925 ms). Further, between the early and late LIFG effects we found higher alpha band activity in RIFG (590-740 ms). These demonstrate that syntactic reanalysis is conducted by recurrent activity across multiple frequency bands, while suggesting a role of RIFG in addition to the fundamental left hemisphere syntax network.

21. The role of YouTube as a motivating factor in the social activity "Developing a documentary in English" in the TOEFL Brazilian context

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: applied linguistics, English teaching in Brazil, YouTube, social activity, documentaries

This work is placed in the field of Applied Linguistics (Moita Lopes 2006; Rajagopalan 2004) and examines social repositioning. We focus on a specific social practice of students from a federal university in Brazil, and take the stance that the individual is legitimized as competent speaker of a language while they interact verbally in a collective practice. In our case, the main goal is to treat the teaching of English as a Foreign Language as a socio-cultural-historical practice (Engeström 2009) through a specific social activity: the production of a documentary in the target language by journalism students for them to participate in a documentary competition, and then to post the production on YouTube (Larré 2012).

We found that the fact of posting the documentaries on YouTube provides a real reason for the students to act in a critical-creative-collaborative environment to perform a social activity, and to be immersed in an expansive transformational process in language proficiency. A posting on YouTube promotes the expansion of learning, providing a platform for the result of the social activity that goes beyond the classroom and the university context, and becomes "life the way it is" (Marx & Engels, 1846/2006). It is an action that leads individuals on to wider objectives, through their engagement with English language learning and language practices.

22. L2 acquisition of English speech rhythm: implications for language teaching and assessment

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: second language acquisition, laboratory research, language teaching, language assessment, English speech rhythm

This presentation aims to demonstrate how results of laboratory research on second language (L2) acquisition can contribute to improvements in language teaching and assessment.

English teachers often report that teaching English pronunciation to L2 learners is difficult, and speech rhythm presents the most difficulties (Barry 2007). Assessing L2 English pronunciation proficiency is equally problematic, which is reflected in the vagueness of, for instance, the current descriptors of the Common European Framework of Reference (e.g. A2 level pronunciation is "generally clear [...] despite a noticeable foreign accent" (CEFR 2001).

In this study, we attempt to contribute to the development of more detailed pronunciation performance descriptors by investigating the acquisition of a number of properties which are known to contribute to the perception of speech rhythm, such as vowel reduction and accentual lengthening (Prieto et al., 2012). More specifically, we asked (1)

how learners of different L1s acquire the properties which contribute to rhythm, focusing on the role of L1 and universals; and (2) whether learners' development of these properties is reflected in their L2 rhythm acquisition process.

We compared L2 English learners at two proficiency levels (based on standardized placement tests), of two typologically different L1s, Mandarin and German. The learners were asked to read English sentences in which syllable structure was systematically varied. Native speakers of English, Mandarin, and German participated as control groups. The data were analysed acoustically in Praat (http://www.fon.hum.uva.nl/praat/).

We found that learners of typologically different L1s follow similar developmental paths in the acquisition of vowel reduction and accentual lengthening, irrespective of similarities and differences with the L1. This suggests that these properties can be used as descriptors in pronunciation assessment, since they discriminate well between levels, and their development appears to be free from L1 interference. In addition, the development of these properties is indeed reflected in their L2 rhythm acquisition process, as predicted. This suggests that, by focusing on these properties in pronunciation classes, teachers can significantly improve L2 learners' speech rhythm.

23. Enhanced motor abilities as speech exaptations

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: Speech, animal calls, lip-smacking, Instrumental Gesture Calls, gibbon soprano singing

Various theories exist to explain the anatomical and/or neural origins of speech, which include motor and cognitive theories of both perception and vocal learning abilities. This work focuses on motor theories of speech in primates.

Given that certain motor abilities arose in our primate ancestors through the simultaneous use of previously established, independent ones, we argue that this synchronous sharing may have provided the necessary connections that formed the neural sensory-motor basis for a number of "enhanced motor abilities", which can be seen as evolutionary stages of speech.

Lip smacking in macaque monkeys (Ghazanfar et al. 2012): Lip-smacking, almost always directed at another individual – much like speech – is an affiliative facial expression observed in Old World Primates. Lips, tongue and hyoid all move at 4-5 Hz and coordinated in a way that is consistent with the universal rhythm of speech. Moreover, both lip-smacking and speech appear to be dependent on the same (or homologous) cortical circuits.

Instrumental gesture calls (Hardus et al. 2009; Lameira et al. 2011): Wild orangutans are able to lower the maximum frequency of calls while maintaining other parameters similar. This makes them sound as if their body is larger than it actually is. This reinforces the orangutan as potential predator through deception. This ability to produce an acoustic signal irrespective of internal emotional states might be seen as a prerequisite to abilities such as call imitation, innovative and arbitrary/deceptive calls, potentially paving the way for the emergence of a neural basis of speech.

Soprano singing in gibbons (Koda et al. 2012): The acoustic and physiological mechanisms used in gibbon singing are analogous to human soprano singing. Social and ecological pressures influence the development of such technique, which, despite the lack of additional amplification organs, allowed gibbons to produce and propagate pure-tone songs in dense forests with poor visibility. This points at the role of dynamic control of the vocal tract as opposed to anatomical modifications, a very important factor also in the structure of human speech.

A review of cases such as the ones listed points to the idea that the anatomical and neural bases required for speech were already established before language existed (sensu Fitch et al. 2005).

24. An evolutionary perspective on language and complexity

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: complexity, environmentally-driven adaptation, language emergence

It has been commonly argued that all human languages are equally complex/simple and equally capable of expressing the same ideas. The present work approaches the evolution of complexity in the language domain, relying on Deacon's (2006) various levels of emergence. The discussion focuses on grammars of internal languages and how these display traces of cumulative complexity (Deacon's third level) that go beyond the confines of internalism, since they entail development.

We will discuss the evolution of complexity by drawing insights from two domains. The first is the Al-Sayyid Bedouin Sign Language, which came about in the last 70-75 years in a relatively isolated inbred community in Israel, and arose due to the presence of a gene for non-syndromic, genetically recessive, profound pre-lingual neurosensory deafness (Scott et al. 1995). Fieldwork suggests a gradual evolution of certain prosodic and syntactic structures (Sandler et al. 2005, 2011). The second is the song of Bengalese finches, which "partially reflects early ontogenetic conditions", whereas "considering that song syntactic complexity is subject to female preference in the Bengalese finch, it is likely that maternal resource allocation strategies play a role in song evolution" (Soma et al. 2009). It has been argued that long-domesticated Bengalese finches display a more complex courtship song when compared to their wild cousins (Okanoya 2012). It seems that the existence of properties like varying complexity in what gets externalized is not restricted to humans, and that in addition the factors that affect these properties are quite alike across species in that they are environmentally-driven adaptations.

By comparatively reviewing findings in recently emerged sign languages and birdsong, we argue that it is important to take into account the role of socio-cultural factors and how they affect the linguistic phenotype, which is in line with an evolutionary perspective.

25. Croatian Sign Language (HZJ) learning strategies

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: Croatian Sign Language, learning strategies, language learning, HZJ

The aim of this study was to examine the use of learning strategies for Croatian Sign Language (HZJ) by students of the Speech and Language Pathology study program at the Faculty of Education and Rehabilitation Sciences, University of Zagreb (N= 69), and students ("course takers") attending an HZJ course in the Association: "Theatre, Visual Arts and Culture of the Deaf – Dlan", as well as in the Croatian Association of the Deafblind – Dodir (N=129). For 45 faculty students HZJ was an obligatory course, and for 24 of them it was an elective course.

The instrument used was the Strategy Inventory for Language Learning (SILL) (Oxford, 1990).

T-test demonstrated that there was no significant difference between the students and course-takers in the use of language learning strategies, and that both groups used social strategies primarily, such as cooperation with the teacher and other students, which encourage interaction in the learning process. Both groups equally use the following strategies (in order of frequency): compensation, metacognitive, memory and cognitive strategies. Affective strategies are used the least, therefore indicating that the students should be directed to use the strategies for reducing anxiety and fear when learning this complex and challenging language.

26. A corpus-based study on the roles of L1 and proficiency in the L2 development of English grammatical morphemes

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: learner corpus, second language acquisition, English grammatical morphemes, L1 influence

Based on a large-scale longitudinal learner corpus, the study investigates whether the longitudinal second language (L2) developmental trajectories of accuracy vary across English grammatical morphemes (articles, past tense *–ed*, plural *–s*), learners' first language (L1) backgrounds, and their overall proficiency. The study exploits EF-Cambridge Open Language Database (EFCamDat) and targets 140,000 essays written by 46,700 learners of 10 typologically diverse L1 backgrounds (Japanese, Korean, Spanish, Russian, Turkish, German, French, Italian, Mandarin-Chinese, Brazilian-Portuguese) across a wide range of proficiency (A1-C2 in the Common European Framework of References for Languages).

The study employed three analyses. First, it analysed whether any significant association is present between the typical developmental trajectories identified through a cluster analysis and the L1 and proficiency of the learners who follow the patterns. For example, it examined if L1 Japanese learners are more likely to be classified into the group of learners whose accuracy consistently increases compared to the other L1 groups. Second, mixed-effects modelling directly tested whether the developmental trajectories of accuracy vary across morphemes, learners' L1, and their proficiency. To partially complement the mixed-effects models that assumed linear relationships in the longitudinal developmental patterns as well as in the proficiency effect, the third approach, generalized additive modelling, statistically tested the effects of the concerned variables while allowing the nonlinear effects.

The results are as follows: with respect to morphemes, there are certain commonalities but also some differences. A very common pattern observed across the morphemes was flat development (i.e. absence of change in accuracy across the observed period). However, at the same time, the proportion of the learners who follow the pattern depended on morphemes. As to L1 influence on the developmental shape, the results depended on the analysis and I was not able to draw firm conclusions. It, however, showed the importance of triangulation at the level of data analysis. With regard to proficiency, the effect was clearer: it affects the developmental path. Higher proficiency learners tended to show flatter development perhaps due to the ceiling effect. A prominent phenomenon observed throughout the study was large individual variation. The study demonstrated large individual differences in terms of the absolute accuracy, the accuracy difference between morphemes, and the rate of development. Taking all the findings combined, the development of morpheme accuracy is a complex process influenced by a variety of factors.

27. Young learners' use of syntactic and visual cues in the interpretation of English relatives

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: relative clauses, English, child L2 acquisition

Bilingualism offers a privileged window for the understanding of language and cognition as well as their interaction (Bialystok et al. 2009). This poster discusses the acquisition of relative clauses in English as a second language by young speakers of Chinese. Ever since Keenan & Comrie (1977) for typology, and Sheldon (1974) for comprehension in children, studies of relative clauses (typological, syntactic, processing) have observed an accessibility scale, according to which subject relatives (1) are the easiest in production and comprehension, followed by object relatives (2), possessives (3) and, finally, those that relativize a prepositional phrase (4). Easier access is characterized as preference in production, more accurately interpreted in comprehension and faster in processing.

(1) the boy who ~~*the boy*~~ is hitting the lion
(2) the boy who the lion is biting ~~*the boy*~~
(3) the girl whose bicycle is broken
(4) the girl who the lion is running after ~~*the girl*~~

The current study contrasts the comprehension of subject and object relatives, based on a picture selection task, taking into account linguistic and visual cues. The experimental factors include linear order

and semantics. We are examining the role of linguistic information and that of alternative means (semantics, visual cues) in the interpretation of the test items, which are presented aurally and visually.

Both Chinese, the participants' L1, and English display subject-verb-object as the basic sentence order. Chinese relatives, however, precede the noun they are modifying, in contrast to English ones, that follow. Does the order of the noun phrases play a role in their interpretation? All participants are animate and either of them could be the subject or the object, in other words, semantics allows for more than one interpretation.

The test results show no significant differences in the comprehension of subject versus object relatives. Interestingly, we also observe that the performance on single items varies a lot, but this only applies to object relatives. This information suggests that the participants rely on alternative sources of information in the comprehension of different types of relative. This will allow us to elaborate on the interaction between language and cognition.

28. Incorporating structured distributional similarity into a Semantic Textual Similarity task

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Theme: Philosophy of language meets computational linguistics

Keywords: computational linguistics, compositionality, semantic similarity, vector space models, kernel methods

Since the 1970s, vector space models of semantics (VSMs) have been used to model word similarity, and have been shown to successfully predict human similarity judgements. In recent years VSMs have been extended with compositional methods for two-word combination, e.g. adjective-noun, verb-object, and noun-noun combinations, with simple methods such as vector multiplication predicting human judgements with respectable accuracy. The challenge now is to extend such compositional methods to sentence similarity: for example, is the sentence "John said he is considered a witness but not a suspect" similar to the sentence "'He is not a suspect anymore,' John said"? The ability to measure sentence similarity could be of significant value to computational linguistics tasks including paraphrasing, machine translation, and automatic summarization.

To help meet the challenge of scaling similarity models to the sentence level, the Semantic Textual Similarity (STS) shared task was introduced as part of the Joint Conference on Lexical and Computational Semantics in 2012 and 2013. The datasets consist of paired sentences and phrases from a variety of domains including headlines, machine translations, and dictionary glosses, which human annotators have rated for similarity. Systems participating in the task must predict the similarity assigned by human annotators to the sentence pairs.

This poster presents our approach to the 2013 STS shared task. Because text length and grammatical quality vary across the datasets, our submissions to the task aimed to investigate whether models that incorporate syntactic structure in similarity calculation can be consistently applied to diverse and noisy data.

We investigated several methods, but found that the use of a regression algorithm to combine a tree kernel with a lexical kernel produced the best results. The tree kernel representation provides a way to calculate similarity between a pair of sentences by comparing subtrees of the sentences' parse trees. A lexical kernel is a straightforward similarity measure calculated from word overlap between sentences, with determiners and other high-frequency words ignored. Regression is used to provide a weighted sum of the two similarity measures and to adjust this sum to have a closer correspondence to human judgements. Due to the nature of the datasets in this task, we found that the lexical kernel was given a higher weight, but the tree kernel provided additional benefit. Our simple method was rated 53 out of 90 systems, where the winning systems involved many more components and most systems disregarded sentence structure.

29. Concepts, properties and their variations: CSLB property norms bridge conceptual models and computational linguistics

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Theme: Philosophy of language meets computational linguistics

Keywords: features, semantic knowledge, computational models

The representation and processing of concepts in the world is a central topic in many fields of research, including cognitive psychology, neuroscience, linguistics and philosophy. Having quantitative, high-dimensional models of the meaning of concepts is critical to developing and testing theories of conceptual processing. Many cognitive models of conceptual knowledge agree that concepts are composed of semantic features and the nature and distribution of these features within and across concepts can explain known aspects of concept processing, such as the semantic category deficits associated with various neuropsychological conditions. Extensive semantic feature norms that have been collected in a systematic and detailed manner are crucial to continuing theoretical development.

The current most extensive published norms are those collected by McRae et al (2005). Participants are asked to list all the features they associate with a given concept, for example *zebra* – has four legs, has a mane, is found in Africa, lives in zoos, etc. The McRae norms have features for 541 concepts that have been produced by a minimum of 5/30 participants.

We present a new set of 637 norms, designed to be a more flexible tool appealing to a wider range of research disciplines. Our norms build on the strengths of the McRae methodology, while introducing novel elements. First, the norms were collected online and early stages of the feature collation were completed automatically, using a part of speech tagger, parser and morphological decomposition to promote systematicity. Second, the norms include information, such as the syntactic variations (does, is used for, etc.) and synonyms (contain, hold etc.) that have been collapsed into each feature (does contain_hold) and we list all features that have been produced by two or more participants.

The results show good comparability with the McRae norms. There are high correlations in the number of features, number of shared features and number of distinguishing features per concept. There are also some significant improvements, in that our norms have a tighter category structure.

One potential use of these more flexible norms is to enable computer scientists to develop more effective programmes for the automatic extraction of semantic information from large corpora. These norms have great potential to make a contribution to theory development across many different scientific disciplines.

30. Sub-sentential speech and Default Semantics

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Theme: Philosophy of language meets computational linguistics

Keywords: sub-sentential speech, Default Semantics, contextualism, propositionality.

This research project investigates linguistic incompleteness. Incomplete utterances are very commonly used, as my survey of corpus samples has shown. Utterances such as

(a) "I did too."

and

(b) "Nice dress!"

are both somehow incomplete. However, when uttered in the appropriate context, both are able to communicate complete meanings without sounding problematic to the hearer. Depending on how broadly we define incompleteness, even an utterance such as "it is raining" can be considered incomplete (Recanati 2007). I thus discuss different kinds of incompleteness – metaphysical, syntactic, pragmatic – attempting to see which level of representation is the most appropriate for the completion of meaning (i.e. propositionality) to be assumed.

Moreover, I investigate whether the two cases of incomplete utterances in (a) and (b) are manifestations

of a unified phenomenon, like indexicalism supports (Stanley 2000). Indexicalism bases this view on the claim that all dependency of an utterance on the context can be traced in hidden variables in the logical form. However, there is an important difference between (a) and (b), namely that the meaning of (a) normally becomes complete on the basis of the immediately preceding linguistic discourse; it is a case of what is standardly known as syntactic ellipsis. The meaning of (b), on the other hand, normally becomes complete on the basis of extra-linguistic contextual information, available to the interlocutors during conversation (e.g. a girl walking by wearing a dress); it is what can be called "pragmatic ellipsis", or "sub-sentential speech" (Stainton 2006). Sub-sentential speech is in fact so pervasively context-dependent that a minimalist/indexicalist approach would need to postulate a number of methodologically unjustified hidden variables in the logical form to be able to capture its intuitive meaning.

In this project, thus, I argue that what we need instead is a contextualist approach like Default Semantics (Jaszczolt 2005) which, by taking into consideration all sources of linguistic and extra-linguistic information available to the interlocutors, can give a more plausible account for the completion of meaning of sub-sentential speech. The fact that sub-sentential speech is able to communicate complete meaning is an indication that propositionality is not to be found on the sentential level, but on the level of mental representations, such as the Merger Representations proposed by Default Semantics, where information from different sources of information comes together.

31. How imprecise is precise talk? The case of predicates of geometrical shape

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Theme: Philosophy of language meets computational linguistics

Keywords: shape, vagueness, gradability, imprecision, contextualism

Why do people use precise words to convey imprecise messages? Following Austin's famous example "French is hexagonal" (Austin (1955/62: 143), in the present research I try to answer this question by focusing on geometrical shape predicates (GSP). Such a topic has never received extensive attention in the linguistic and philosophical literature, but can reveal a useful testing ground for the semantic analysis of words whose meaning is apparently very precise, but that are used in conversation with contextually variable degrees of tolerance. In particular, GSPs seem to express lexical meanings that are presumably definitional or equivalent to some kind of "(probably) innate concepts of geometrical perfection" (Carston 2002: 337); however evidence from corpora of English shows that GSPs are regularly used to express potentially true sentences with low standard of precision, in contrast with the presumed definitional nature of the concepts they encode.

Extant theories dealing with analogous predicates (e.g. Carston 2002, Recanati 2010, Kennedy 2007) assume that such a contrast is accountable in terms of *imprecision* ("mere pragmatic looseness of speech" (Lasersohn 1999: 535), and conclude that such words belong to an *ad hoc* category of polysemous predicates (absolute gradable adjectives) that is crucially immune to semantic vagueness. Using standard semantic tests, however, I show that most of GSPs can be proven in fact to be vague, casting doubt on their exact lexical categorization and on the sharp distinction between semantic and pragmatic phenomena of lexical modulation.

My proposal is to refine Lewis's (1979) idea that GSPs are always used with contextually variable standard of precision, and use a contextualist account of vagueness (such as Fara's (2000)) to argue that the relevant standard can be taken as a function of the speakers' interests in a given context.

32. Language interaction in the development of prosody in simultaneous bilinguals

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: language acquisition, bilingualism, prosody,

cognitive development

The increasing awareness of the social and economic impact of bilingualism have given increasing impetus to research on bilingualism. However, the questions of whether bilinguals have one or two language systems and whether the environments in which the languages are acquired are a crucial factor in determining proficiency remain open. One point that seems to be unanimously agreed on is the "fact" that bilingual children are slower in their language development than monolingual children. But is this really the case?

In this paper we report two studies which investigated rhythmic development in Spanish-English bilingual 2-, 4- and 6-year olds living in the UK (UKBL) and Spain (SPBL), and a comparison to a monolingual baseline (ML) in a semi-structured elicitation task in which children described simple everyday actions. We asked whether the children follow the same developmental paths as monolinguals, or whether target-like acquisition of rhythm in one will facilitate the acquisition in the other language. We analysed pre-boundary lengthening and accentuation, which have been shown to correlate with rhythm, together with a set of rhythm metrics which have previously been found to be discriminative for child speech (Varco-V, %V, rPVI-C).

Vocalic rhythm metric scores in Spanish reveal that 4-year-old bilinguals and monolinguals have adult-like proportions of vocalic material in their speech. However, in English the variability of vocalic intervals is significantly lower in the SPBL group, highlighting the importance of ambient language. Unlike ML, who show off-target variability in consonantal variations in both English and Spanish even at 6, all bilinguals have adult-like rPVI-C scores already at the age of 4.

We conclude that in bilinguals the two languages interact, leading to faster acquisition of certain prosodic features. However, bilingual children only appear to have an advantage when the language spoken is structurally more complex. The exposure to more varied structurally motivated distinctions might have led to more stable representations and/or better articulatory motor control. Our consonantal findings, in particular, suggest that bilinguals may be benefitting from more advanced motor control due to the production of a greater variety of structures which allows them to learn to coordinate complex articulatory gestures at an earlier age. Hence, studies of bilingual language acquisition help shed light not only on the acquisition of linguistic structures cross-linguistically, but are also crucial for understanding the relative roles of cognitive development and motor control in the development of child speech.

33. Politeness and off-record indirectness

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Theme: Philosophy of language meets computational linguistics

Keywords: pragmatics, indirect speech, politeness, speech acts

Off-record speech is a unique type of indirectness comprising, amongst other forms, hints and innuendo. Interpretation is reliant on context, such that an utterance like "I'm rubbish at stats", whilst literally a statement of fact, may function as an off-record request for assistance with an assignment, or as an off-record excuse to delay a deadline, when used within an appropriate setting. Off-record utterances may be used to communicate a variety of speech acts, including, but not limited to, requests, suggestions, offers, bribes, and threats. Due to the pragmatic ambiguity inherent in any off-record act, the desired (implicated) speech act meaning may be plausibly denied.

Established accounts (Brown & Levinson 1987) attribute the use of off-record utterances to a speaker's deliberate desire to express his or her act politely, thereby respecting the addressee's face. A speaker's evaluation of the imposition posed by the act in question (R), the hearer's relative social power (P), and the social distance between the interlocutors (D), motivate the speaker to choose off-record options over more direct alternatives.

Pinker and colleagues (2008, 2010) have proposed an alternative motivation. Focusing specifically on high stakes acts (including bribes and threats), they argue that off-record speech affords the strategically-minded speaker the opportunity to effectively balance potential payoffs and costs, articulating the desired speech act (and allowing for the accompanying benefits it entails) while likewise avoiding the legal, financial, and social consequences associated with direct (otherwise

equivalent) speech acts. Politeness, they assert, is inconsequential.

The proposed poster will present qualitative and quantitative data from a recently completed questionnaire examining the use off-record speech for two speech acts – bribes and favours. I will present sample utterances and include statistical analyses revealing the frequency with which participants opted for off-record options, their sensitivity to P, D, & R in choosing whether to do so, and the incorporation of a wide-range of features reflecting both negative and positive politeness. The implications of these findings in relation to both theoretical accounts will be discussed and directions for future research will be proposed.

34. Tagging and compositionality

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Theme: Philosophy of language meets computational linguistics

Keywords: tagging, folksonomy, compositionality

Can words in a simple, unordered set behave compositionally? A recent experiment asking humans to provide descriptive keywords ("tags") for images suggests that two syntactically unlinked keywords can compose their meanings and jointly assign a meaningful label to an image. A total of 219 participants provided tags for 5 art images and on a separate phase, they were asked to describe the same stimuli using coherent text.

On average ⅔ of a user's tags for a picture appear as words in his/her textual description of the image, suggesting that tagging acts as a means of linguistic description without the possibility or the expectation of using syntax. Even in cases where the order of words in a phrase is essentially fixed (e.g. "young girls" found in textual descriptions of images), when tags are elicited, they may be given in either order with equal or similar frequency (e.g. "girls"-"young" 50%; "young"-"girls" 50%). Moreover, some pairs of tags (e.g. "vase"-"flowers" 64%; "flowers"-"vase" 36%) appear in the text with a strong preference of order ("vase"-"flowers" 93%; "flowers"-"vase" 7%) in semantically homogeneous relationships (e.g. "vase of flowers", "vase full of white flowers", "vase with flowers" etc.). This suggests that there is some underlying composition involved. One might claim that tag composition takes place because tags are not as unstructured as they seem and are in an order that reflects some kind of mental syntax (e.g. a user assigning the tags "house" and "trees" one after the other, might be implicitly forming a phrase such as "house surrounded by trees"). An analysis of the entire tag and description datasets revealed that the order between two tags co-occuring in a user's annotation was at least 5 times more flexible than the order of the same pairs appearing as words within a text description (i.e. the difference between the probability of encountering the tag sequence "a"-"b" and the probability of tags "b"-"a" is 5 times smaller than the difference between the probability of words "a"-"b" and the probability of words "b"-"a" in a description).

Pairs of words from a considerably less syntactically ordered set than words from sentences can still behave compositionally. Such an observation points in the direction of a dynamic compositionality that considers more than just the logical form of a phrase.

35. Hemispheric contributions to spoken language comprehension in patients with left hemisphere stroke

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Theme: Beyond our primate inheritance: neurobiological and evolutionary approaches to language

Keywords: comprehension, semantics, syntax, aphasia, reorganization

Understanding the relationship between brain and cognition critically depends on data from brain-damaged patients, since these provide major constraints on identifying the essential components of brain–behaviour systems. Here we relate structural and functional fMRI data with behavioural data in 21 human patients with chronic left hemisphere (LH) lesions and a range of language impairments to investigate the

controversial issue of the role of the hemispheres in different language functions.

We address this issue within a dual neurocognitive model of spoken language comprehension in which core linguistic functions, e.g. syntax, depend critically upon an intact left frontotemporal system, whereas more general communicative abilities, e.g. semantics, are supported by a bilateral frontotemporal system and may recover from LH damage through normal or enhanced activity in the intact right hemisphere. The fMRI study used a word-monitoring task that differentiated syntactic and semantic aspects of sentence comprehension.

We distinguished overlapping interactions between structure, neural activity, and performance using joint independent components analysis, identifying two structural–functional networks, each with a distinct relationship with performance. Syntactic performance correlated with tissue integrity and activity in a left frontotemporal network. Semantic performance correlated with activity in right superior/middle temporal gyri regardless of tissue integrity. Right temporal activity did not differ between patients and controls, suggesting that the semantic network is degenerately organized, with regions in both hemispheres able to perform similar computations.

Our findings support the dual neurocognitive model of spoken language comprehension and emphasize the importance of linguistic specificity in investigations of language recovery in patients.

36. Automated Assessment models, Visual User Interfaces, and Second Language Acquisition research: an interdisciplinary perspective

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Theme: Interdisciplinary perspectives on multilingualism

Keywords: automated text scoring, machine learning, visualization, usability studies, second language acquisition

The field of Automated Assessment (AA) of text focuses on automatically analysing and assessing the quality of writing. A number of AA systems have been developed, usually employing natural language processing and machine learning techniques, where language learners can submit samples of their writing and receive feedback on them.

AA systems assign grades/scores based on textual features, which attempt to balance evidence of writing competence against evidence of performance errors. These textual cues represent the internal "marking criteria" used to automatically evaluate someone's writing and predict their proficiency level. In order to assess the validity of AA systems, it is important we understand those criteria and what drives their predictive power. AA models are not a panacea, and their deployment largely depends on the ability to examine their characteristics, and, more specifically, examine whether their internal "marking criteria" can be interpreted in a meaningful and useful way, whether they measure what is intended to be measured, whether they are accurate and fair, whether any kinds of bias have been introduced, and, in general, whether their development reflects sound pedagogy.

In this paper, we present a Visual User Interface (VUI) which allows interactive investigation and supports interpretation of a set of AA textual linguistic features discriminating between passing and failing First Certificate in English (FCE) ESOL exam scripts (Briscoe et al., 2010). The VUI employs visualization techniques and displays directed graphs to model interactions between features, while supporting exploratory search over FCE learner scripts, instantiating them and allowing statistics, such as the co-occurrence of features or presence of other linguistic properties, to be derived quickly. Our experiments demonstrate that visualization of AA features can support Second Language Acquisition (SLA) research, and, in particular, aid the development of hypotheses about the linguistic abilities that characterize different levels of attainment and, more generally, developmental aspects of learner grammars. Additionally, we illustrate how hypothesis formation through visualization of AA features can inform the development of AA systems and further improve their performance through the identification of new textual predictive cues. In other words, AA features can be interpreted in a meaningful way, and this, in turn, can be used to enhance automated scoring

of text quality.

Finally, we evaluate the effectiveness, efficiency and usability of the VUI through a within-subjects controlled usability study employing head-to-head comparisons (Hearst 2009). Evaluation of visualization systems and, generally, of computer-based interfaces is a key component in ensuring their quality, success, and adoption by the target user population – in our case, SLA researchers, teachers and assessors. Results from our study and participants' feedback during the evaluation gave us several interesting directions for future work.