

Organized Session — Workshop on Bilingualism
LSA Annual Meeting in Portland, OR (January 2012)

Moderators: LSA SIG on Bilingualism coordinators

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The goal of bilingualism is to explore theories of language that are biologically plausible as part of an effort to explain how the faculty of language arises both ontogenetically (over the course of an individual's lifetime) and phylogenetically (on an evolutionary timescale). The LSA Special Interest Group on Bilingualism, founded in 2009, seeks to explore these questions as well as to help the field of bilingualism define itself by, as stated in the SIG description, "helping to identify what makes bilingualism 'bio' (and 'linguistic'), initiate discussions on how it differs from previous models of generative grammar (and how it doesn't), debate whether generative grammar is actually a prerequisite [...] and so on."

This session is thematically arranged into three blocks concerning questions that have emerged at the forefront of current bilingual research: (1) How do linguistic operations relate to other cognitive abilities? (2) More specifically, where does the syntactic operation Merge come from? And (3) how can archaeology and other inquiries into the past inform our knowledge of language evolution? The presenters selected to address these questions include both linguists and biologists from across North America and Europe; some are young researchers, while others are already established as recognized leaders in the field.

'Language faculty': The first two talks address question (1), how the language faculty relates to other cognitive abilities, in particular in light of Hauser, Chomsky & Fitch's (2002) distinction of a language faculty in the broad sense (FLB) and a language faculty in the narrow sense (FLN). They will discuss matters such as whether linguistic categorization can be considered an exaptation of an FLB property and how the process of language acquisition can be framed from a bilingual perspective.

'Merge & more': Moving on to FLN, two talks will address further properties. One examines the relation between language and arithmetic from a bilingual perspective on the basis of complex numerals, which are assembled and interpreted through Merge and the recursive procedure of FLN. The other deals with the minimal properties of Merge within FLN in an attempt to reach conclusions about the possible evolutionary steps necessary to arrive at the complexities of human language.

'Past, present, and future': The final presentation on (prehistoric) geometric engravings draws on research from paleoanthropology and archaeology in order to further specify the properties of the computational system, with particular reference to language. The bilingual core underlying all five presentations will be debated further at a concluding roundtable discussion involving the moderators, the speakers, and the participating audience.

Participants: Alexander Clark
Rose-Marie Déchaine & Mireille Tremblay
Anna Maria Di Sciullo
Bradley Larson
V́ctor Longa

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Each half-hour slot is to include 20 minutes presentation plus 10 minutes discussion.
three-hour session: 5 half-hour slots + 1 half-hour roundtable discussion

Session 1: THE LANGUAGE FACULTY

Alexander Clark

'Distributional learning as a biologically plausible theory of language acquisition'

Rose-Marie Déchaine & Mireille Tremblay

'Categorization, cognition and biolinguistics'

Session 2: MERGE AND MORE

Anna Maria Di Sciullo

'Arithmetic and language as biologically grounded in FLN'

Bradley Larson

'A vestigial operation'

Session 3: PAST, PRESENT, AND FUTURE

Víctor Longa

'Prehistoric geometric engravings and language: A computational approach'

ALL PARTICIPANTS, MODERATED BY THE ORGANIZERS

Roundtable Discussion

SHORT ABSTRACTS

Alexander Clark

'Distributional learning as a biologically plausible theory of language acquisition'

A rich and complex UG is evolutionarily implausible: Biolinguistics, as a result, stresses the importance of minimizing UG perhaps to just a general mechanism for constructing hierarchical representations of certain types (*Merge*). This still leaves language acquisition — the fundamental empirical problem — unexplained. One plausible assumption is that language is optimal for language acquisition: It has the properties that it allow it to be acquired easily by simple general purpose learning mechanisms. We claim that studying general principles of efficient computation (so-called third factor principles), when applied to language acquisition under these assumptions leads inexorably to a “neo-empiricist” model based on distributional learning. Rapid progress in this field in recent years makes sophisticated versions of distributional learning a biologically and linguistically plausible model of language acquisition.

Rose-Marie Déchaine & Mireille Tremblay

'Categorization, cognition and biolinguistics'

Categorization is a general-purpose cognitive ability and part of faculty of language in the broad sense (FLB). We argue that *linguistic categorization* is an exaptation of this FLB property. The mechanism that makes this possible is recursive *Merge*, a property of faculty of language in the narrow sense (FLN). If categorization is a general cognitive process, then categorical distinctions should be fluid, emergent, and dynamic. This captures the insights of emergentist analyses within the larger purview of language as a dynamic biological system. We review the predictions that the “categorization is cognition” hypothesis makes for the ontology, ontogeny, phylogeny, neurology, diachrony, and typology of categorization, as well as for the production and perception of categories. For each domains, we show that (i) linguistic categories are not fixed and static; (ii) there is a difference between FLB- and FLN-categorization, with the latter constrained by recursive *Merge* (which forces exhaustive class partition).

Anna Maria Di Sciullo

'Arithmetic and language as biologically grounded in FLN'

We explore the properties of complex numerals in different languages, and the relation between language and arithmetic from a biolinguistic perspective. We raise the following questions: What is the computational procedure that derives complex numerals? How is this procedure biologically implemented? We argue that simplex numerals (NUM) are related by functional projections with valued features (ADD, MULT) and unvalued features (uNUM). The elimination of valued features triggers *Merge*, while valued features are legible by the neuronal system that processes

arithmetic expressions, even when they are not pronounced. Brain-imaging results reported in Friedrich & Friederici (2009, work in process), indicate that the brain interprets mathematic and syntactic expressions differently, as evidenced by differences in the strength of fronto-parietal activations. These results bring support to our claim that complex numerals and syntactic expressions are derived by Merge and the recursive procedure of FLN, while their interpretation activates the neuronal network differently.

Bradley Larson

'A vestigial operation'

There is a tension in syntactic theory between descriptive and explanatory adequacy. With grammar conceived of as a psychologically reality, proposed formal accounts must not only capture the empirical landscape but also plausibly explain the acquirability and evolvability of that entity. With respect to evolvability, syntactic theory should be judged successful when the grammar proposed could have appeared in an evolutionarily plausible way. That is, more complex theoretical operations should in some instances be decomposable into simpler ones. Currently, the minimal structure-building operation in generative syntax is 'Merge', defined as grouping (two) grammatical objects together and selecting one of them as the label for that grouping. It is possible to conceive of merge as a composite operation made up of a grouping operation and a labeling one. If Merge is decomposable, its evolvability is less problematic. Further, there exists evidence of the independent exploitation of its component parts.

Víctor Longa

'Prehistoric geometric engravings and language: A computational approach'

A usual assumption in paleoanthropology and archaeology is that symbolic behaviors imply language. Therefore, archaeological remains that seem to indicate symbolic practices are taken to imply complex language. However, an alternative approach exists which fully agrees with the computational nature of language: to analyze archaeological remains according to the computational capabilities required for their production. From this view, Uriagereka and associates have argued that evidence of knots in the archaeological record is computationally equivalent to complex language: Knot-tying shows context-sensitivity, a key property of language. I will further extend that approach, by discussing intentional engravings from (1) the African Middle Stone Age (AMH) and (2) Eurasian Lower and Middle Palaeolithic (Neanderthals and Heidelbergensis). The discussion aims to discover (1) whether context-sensitivity may be traced in those engravings and accordingly (2) whether the computational capabilities revealed by those engravings are language-like. This could help clarify what hominid species possessed complex language.