

## Origin of language: a biolinguistic approach.

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### Abstract

The present project consists in the formulation of a model of the evolutionary path for human language, formalizing the relations between different units and cognitive operations that made this ability possible. The model proposed here assumes that language comes from the merge of two communication systems observed in nature (Expressive and Lexical types), also known as the Integration Hypothesis (Miyagawa et al. 2013). The goal of this model is to delineate how these two systems were combined. For this purpose, we use the Applied Evolutionary Epistemology, (henceforth AEE, Gontier, 2017) to verify the logical validity and the coherence of representation of the Integration Hypothesis for language evolution. AEE is a scientific and philosophical methodology used to drive research on evolution, offering a way to define the units, evolutionary mechanisms and levels involved in the emergence of an ability, ensuring the explanatory power of an evolutionary model. After the formulation of the model, it will be confronted with data from the fields involved in linguistic analysis and human evolution (i.e. archeology, neuroscience, pidgins and creoles, language acquisition, cognitive science), to evaluate if the units, levels and mechanisms of the model still hold. The research — in progress — which indicates that ontogeny and phylogeny are related in merge of the two communication systems, lies in a new field called Biolinguistics. Therefore, it is expected that the theoretical model to be developed would, as well, be useful and applicable in related areas.

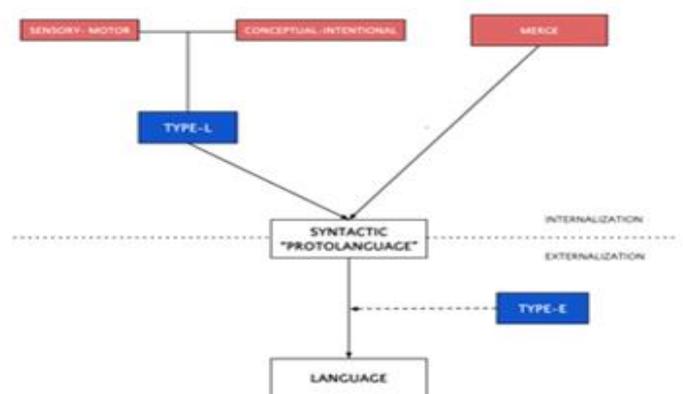
**Key words:** *Biolinguistics, Evolution, Language.*

### Introduction

How did the communicative capacity of *Homo sapiens* arise? Nowadays, there are different approaches which came from AI, biology, philosophy, etc. Mainly, these different views are divided by the nature-nurture debate. Despite this false dichotomy, both sides are important to understanding language and its evolutionary path (e.g. recursiveness, as a phylogenetic characteristic, and the importance of primary data to the acquisition process.). This problem points out the need for a scientific model that can deal with, and organize such issues. By using a well-defined methodology and formalizing relations between different aspects of evolutionary path, this research attempts to formulate a model, which might be applicable in related areas (as AI).

### Results and Discussion

This model of the evolutionary path for language assumes Merge (Berwick & Chomsky, 2011) as the basic mental operation selected by adaptive gains (in terms of organization of thought, hence, internalization as the primary cause) that gave rise to the hierarchical syntactic order of language, which in association with a Lexical Type system (Miyagawa et al., 2013) would generate a "Proto-syntactic language", a more complex communication system that would result in language by a selective pressure for expressive functions (e.g. to mark mating availability), as observed in a Expressive Type system.



**Image 1.** Flowchart of the hypothesis for the evolutionary path.

### Conclusions

The initial results indicates that ontogeny and phylogeny are related in merge of the two communication systems observed in nature, *lexical* and *expressive* type.

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GONTIER, Nathalie. What are the levels and mechanisms/processes of language evolution? *Language Sciences*, v. 63, p. 12–43, 2017.  
FISHER, Simon E. A Molecular Genetic Perspective on Speech and Language. *Neurobiology of Language*, p. 13–24, 2016.  
MIYAGAWA, Shigeru e BERWICK, Robert C. e OKANOYA, Kazuo. The Emergence of Hierarchical Structure in Human Language. *Frontiers in Psychology*, v. 4, 2013.