
A Comparative Approach on the Faculty of Syntax: Towards an Operative Definition of Language

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This paper aims at refining an operational definition of the term “language” that could be effectively used in the investigation of the specificity of the faculty of language in humans. Recent studies claim that what determines humans’ ability to produce and understand language is the capacity to process hierarchical, self-embedding (i.e. recursive) structures (Hauser, Chomsky & Fitch, 2002; Fitch & Hauser, 2004). According to this theory, humans are the only species of animals able to process sentences like a1[The malt] a2 [that the rat] a3 [that the cat] b3[killed] b2 [ate] b3 [lay in the house that Jack built.], in which the ab pairs with higher indexes are hierarchically embedded within ab pairs with lower indexes.

In contradiction to this theoretical framework, recent studies claim that baboons and certain species of songbirds possess the ability to process this same kind of structures (Gentner, Fenn, Margoliash, & Nusbaum, 2006; Rey, Perruchet, & Fagot, 2012), therefore putting into question the claim the ability to process recursive patterns is specifically human. In light of these studies - with the aim to clarify the species-specific nature of humans’ ability to process linguistic patterns - I assume that what differentiates human language from other animals’ cognitive systems is the ability to categorize the units of a pattern, going beyond its perceivable characteristics. More specifically, I assume that what makes humans’ ability of language specific is the intrinsic possibility that the connections within the linguistic structure have an external referential value; in fact, as Wittgenstein (1921) has pointed out, in human language the internal logical connections of a sentence, as feelers, tap into existent states of affairs in the external world. Consistent with this theoretical frame, Deacon (1997) observes that in general, nonhuman animals possess the ability to recognize several bilateral associations between one auditory or visual token and a correspondent external object or action (indexical connection). Human interaction with the world differs because it is guided by the perception of the relationships between objects through the logical relationships between the tokens.

Keeping with this philosophical paradigm, I identify the uniquely human faculty of language in the ability to combine semantic units within a network of logical combinatorial relationships, which map into (being retroactively mapped by) connections among external objects. Using this operational definition of “human language”, it shouldn’t be surprising that some nonhuman species have shown the ability to recognize complex “recursive” patterns: all they were doing was applying acquired rules on a merely perceptual level of operant association between units. No basic meaning was present, and consequently, no semantic or logical dependency was involved in the association between the elements. In fact, humans are the only species known to be able to combine semantic units within a network of combinatorial logical relationships that can be linked to the state of affairs in the external world. I see exactly in this ability the core cognitive process underlying a) the capacity to speak (or to reason) in verbal propositions and b) the general human faculty of language expressed, for instance, in the ability to draw visual conceptual maps or to compute mathematical expressions.

In conclusion, a comparative study of language which aims to identify the specificity of humans' faculty of language should first address the ability to associate a combinatorial pattern in a linguistic dimension to a structural combination among external objects or categories of objects. Secondly, this study should explore other animals' ability to a) process simple perceptual patterns with internal dependencies between the elements, b) refer these basic structures to a pattern of external objects. This could allow us to understand what makes a species-typical human linguistic expression out of a pattern of perceptual stimuli. Finally, the outcome of such an investigation would certainly help refine the meaning of "linguistic", when applied to the definition of man as "zoon logikon".

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