HUMAN LANGUAGE AS A (UNIQUE) COMBINATION OF INHERITED (AND SHARED) DOMAIN-GENERAL COGNITIVE ABILITIES

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In cognitive sciences, human language evolution is classically studied by adopting a strictly human-centered approach: most studies in comparative psychology and comparative neurosciences are aimed at identifying one or several human-language-specific cognitive components (as described in the linguistic literature) or anatomical features (as described in the human anatomy literature) that are either missing to the other animal species, or insufficiently developed to compete with that of humans. These absent or poorly developed properties are proposed as partially responsible for the differences in complexity between human language and other animal communication systems, and are presented as potential "human-unique" features. We will discuss the relevance of human-centered approaches in the understanding of the evolution of human language and non-human communication systems, and propose an alternative that consists in studying inherited domain-general properties that we share with other species.

A current caveat in human-centered comparisons consists in assuming non-explicitly that nonhuman cognitive architectures must *resemble* human cognitive architecture, in parts or as a whole. Such an assumption could hold if: 1) human and nonhuman cognitive architectures had followed similar evolutionary paths and were adapted to comparable environmental, social and biological constraints, and 2) the cognitive architecture of each species was a construction made of independent (non-interacting) cognitive components that are not sensitive to developmental and phylogenic interactive factors. Given that every species has a unique history leading to a unique cognitive architecture, it seems

like a vain enterprise to search for strictly identical components in humans and nonhuman animals. We will illustrate this proposition using syntax.

As an alternative to strictly human-centered approaches, we propose to examine the background of the human language function, namely the inherited domain-general elements of "the machinery required to master human language" (Saffran and Thiessen, 2008), that we share with other species. The underlying hypothesis we uphold here is that complex and phylogenetically recent cognitive functions, including language, are probably the result of intense re-use and re-combination of subsets of inherited anatomical, cognitive, behavioral components (Anderson, 2010). Phylogenetically close species might share with humans a combination of some (but not all) of these components, as a support for communication and/or other cognitive functions. For example, the serial organization and structuration of elements that we find in the processing of syntax might not be language-specific, but could derive from short term memory capacities that might as well be involved in the planning of complex motor sequences in humans (Koechlin and Jubault, 2006), in other primates or even in birds, including sequences of bird's songs (Suzuki, Wheatcroft and Griesser, 2016). More generally, we question the relevance of using human syntax (or other human-centered cognitive, behavioral and anatomical features) as the norm or reference for establishing the level of complexity of non-human communication systems, in particular in species, like cetaceans, whose *Umwelten* and *Umgebung* (von Uexküll, 1956) and, as a consequence, whose cognitive architecture supposedly differ considerably from ours.

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