HOMO SAPIENS IS *HOMO LOQUENS*: THE POWER OF VOCAL LEARNING

JOANA ROSSELLÓ
General Linguistics Department, Universitat de Barcelona, Barcelona, Spain
joana.rossello@ub.edu

Homo sapiens is a species of vocal learners, apparently the only extant one among great apes and terrestrial mammals. This is a fact about human biology. Humans, however, differ hugely from songbirds, the other sophisticated vocal learners known thus far (Arriaga & Jarvis 2013). Only the human ones convey meaning, which to a great extent comes from words. Words, because they are invented, are not the outcome of natural selection (Bickerton 2014); birdsong motives instead conform to it. This notwithstanding, words are built on top of a vocal learning (VL) system which in a way naturalizes them. Words end up residing in and circulating among brains, which must have affected (and affect) the functioning of the latter. This crucial role as a vehicle for words in speech is one of the different aspects which have been grossly underestimated with regard to the contribution of VL to human language and cognition.

By rooting language in a VL system, one gets rid of false dilemmas such as whether what took the lead in the process was communication or cognition, as Tomasello and Chomsky respectively contend. With VL as point of departure the issue dissolves: VL entails *per se* a codependence between social behavior and individual capacity. A second dilemma that fades away is the order of appearance of the computational system (syntax) or phonology (words) in evolution. Yet, if a VL system has a computational system (CS) of its own, the same that combines the words that run on it, the issue ceases to make sense. It has been claimed (Bolhuis, 2014) that the CS underlying birdsong is devoid of the asymmetrical hierarchy present in natural language. This problem is not unsurmountable. As a matter of fact, *merge* alone, the single operation of the CS, yields no asymmetrical structure (*eating apples* is meant to be an instance of

eating and not of apples). A suggestion is that the asymmetry derives from word-related conceptual properties (Boeckx, 2013).

Another eliminative gain is that primate *calls* as such could not have played any role in language evolution, against Miyagawa's integration hypothesis (see Nóbrega & Miyagawa, 2015). Apart from cognitive and behavioral traits – intentionality displayed in the gestures of apes in particular–, there is nothing in great apes' vocalizations that could had been recruited for language: primate *calls* constitute a hurdle in the way to language because of being subcortically controlled and occasionally endowed with a referential power of a mind-independent sort in contrast with that of words, indirect and mind dependent.

The primacy of speech over sign as the default modality must not be elusive anymore (Goldin-Meadow, 2008). Speech is the default option because only speech, by being *auditory-vocal*, fits a VL system, a modality of sensorimotor integration independently available in nature. A gestural protolanguage, however, could not have existed since there is no sensorimotor visuo-gestural other than the signed modality itself (and other human occasional mimicry practices), which emphasizes the crucial role of the sensorimotor integration in language. The essential overlapping of neural correlates for both modalities is also consistent with the idea that sign is modeled after speech.

Highly suggestive of the sufficiency of this bottom-up approach to language evolution is the fact that the brain circuitry in charge of birdsong finds not only a correspondence in the neural pathways that are involved in learned vocal communication in humans but is also essentially coincident with the subcortical network (basal ganglia and thalamus) that is increasingly seen as involved in language (beyond speech) and high cognition as well (Lieberman 2013). *Homo Sapiens* seems to amount to *Homo Loquens.*

References

Arriaga, G. & Jarvis, E. D. (2013). Mouse vocal communication system: Are ultrasounds learned or innate? *Brain & Language*, 124: 96–116.

Bickerton, D. (2014). *A non-selectionist origin for the human mind*. Ms.

Boeckx, C. (2013). Merge: Biolinguistic Considerations. *Eng. Lin.*, *30*(2), 1–21.

Bolhuis, J. J., Tattersall, I., Chomsky, N., & Berwick, R. (2014). How could language have evolved? *PLoS Biology*. Biol 12(8):

Goldin-Meadow, S. (2008) Gesture, Speech and Language. Evolang 7, 427-428.

Lieberman, P. (2013). *The Unpredictable Species. What Makes Humans Unique.*

Nóbrega, V. A., & Miyagawa, S. (2015). The precedence of syntax in the rapid emergence of human language in evolution as defined by the integration hypothesis, *Frontiers in Psychology* 6.