

INTEGRATION OR DISINTEGRATION?

KOJI FUJITA, HARUKA FUJITA

*Graduate School of Human and Environmental Studies,
Kyoto University, Kyoto, Japan
fujita.koji.3x@kyoto-u.ac.jp, muchtoo79@yahoo.co.jp*

An evolutionary novelty often results from combining preexisting old traits. The non-monolithic, modular architecture of human language, which consists at least of the Conceptual Intentional (CI) system for internalization, the Sensory Motor (SM) system for externalization, and the recursive combinatorial system (syntax) for connecting them (Hauser et al., 2002; see also Berwick & Chomsky, 2016) can be understood as a reflection of its evolution taking place in a similar integrating fashion.

The *Integration Hypothesis* (IH) of human language evolution put forward by Miyagawa and his colleagues (Miyagawa et al., 2014, 2015, Nóbrega & Miyagawa, 2015) is an interesting proposal which is in perfect harmony with the aforementioned general picture of evolution. The IH maintains that human language arose from a combination of two separate systems, each being found in nonhuman animals, the E(xpressive) system of birdsong and the L(exical) system of primate calls. It is also interesting because it immediately raises some important questions, among which are: (i) Do other animals really have E and L systems? (ii) If yes, are these nonhuman versions exactly the same as the human counterparts? (iii) How did these two systems get combined only in the human lineage? In this paper, we challenge the IH by carefully considering and answering these questions. In particular, our answers to the questions (i) and (ii) will be in the negative. As an alternative, we propose the *Disintegration Hypothesis* (DH): animal communication systems do not have a clear distinction between E and L systems, and they become separated only in human language.

N&M (2015) defend the proposed distinction of the two systems by linking them to category-defining functional categories and roots ($\sqrt{}$) with no categorial specification (e.g. $n + \sqrt{\text{CAT}} \rightarrow \text{cat}$), respectively, as defined in the theory of Distributed Morphology (Marantz, 1997, et seq.). Exactly what kind of

information these roots contain (only concepts or also syntactic and phonological features) is a matter of hot dispute, but there is no evidence that animal L systems (to the extent that they exist) are equal to the human L system either qualitatively or quantitatively. Human concepts, for example, are abstract (with no direct reference to the external world) and hierarchically organized, built from atomic components and giving rise to a multitude of derived concepts. Also, animal communication systems do not have human-like lexical categories like nouns and verbs, which suggests at least that E system does not exist there. Animal communications do not distinguish between cognitive, instructional and affective elements. Honeybee dances express information about the found nectar, an instruction to collect it, and a concomitant emotional charge all at the same time, as if everything comes as an inseparable whole. The *separation of affect* (Bronowski, 1977) takes place in human language alone.

Given that questions (i) and (ii) cannot be answered positively, the IH now loses much of its force. Furthermore, Miyagawa et al. (2013) once proposed to derive the nonfinite hierarchical structure of human language from the combination of the two finite systems, but to make this combination possible N&M (2015) now resort to the unbounded Merge operation (an answer to question (iii)). An inconsistent redundancy is obvious; Merge alone should be enough, and the combination of E and L systems is just one example of this general operation, which is found only in human language. Our DH solves these problems by maintaining that the separation of these two systems takes place only in human language, as a reverse effect of Merge (Demerge), which is also an important ingredient of human language that seems to apply, for example, in the mapping from the computational system to the SM interface.

The IH also holds that direct combination of two L layers are impossible. Given that Merge is a free, unconstrained operation (Boeckx, 2015), this restriction should be removed. We examine compounding phenomena and show that in fact L layers can combine with each other (root compounding, such as n [$\sqrt{\text{BIRD}}$ $\sqrt{\text{BRAIN}}$] \rightarrow *birdbrain*). The nature of exocentric compounding (such as *birdbrain* with a metonymic interpretation, together with its implication for language evolution (Jackendoff, 2009, Progovac, 2015) will also be examined. We suggest that a rudimentary form of exocentric compounding may be found in animal communication but is fundamentally different from its human counterpart.

We also argue that Merge is the only new function which is necessary for human language to evolve from preexisting capacities, and that Merge itself evolved from sequential and hierarchical object manipulation typically involved in human and animal tool use.

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