Queue Left, Stack-sort Right: Syntactic Structure without Merge

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“[H]ow can a system such as human language arise in the mind/brain, or for that matter, in the organic world, in which one seems not to find anything like the basic properties of human language? That problem has sometimes been posed as a crisis for the cognitive sciences. The concerns are appropriate, but their locus is misplaced; they are primarily a problem for biology and the brain sciences, which, as currently understood, do not provide any basis for what appear to be fairly well-established conclusions about language.” (Chomsky 1995: 1-2)

"A discontinuity theory is not the same as a special creation theory. No biological phenomenon is without antecedents." (Lenneberg 1967: 234)

Merge seems conceptually indispensable in describing syntactic structures. Merge realizes the ancient intuition that sentences have parts; as an observation about sentences, that seems hard to deny. But Merge also crystallizes a hypothesis about cognition, claiming that syntactic brackets are “in” the relevant mental representations: left and right brackets delimit the boundaries of the nested units we implicitly analyze sentences into. This view brings with it the inherent problem of how headedness is to be realized: it is empirically evident that bracketings are associated with particular elements (the heads of the phrases they bound), but connecting phrases and their heads formally has proven notoriously problematic.

I propose a different understanding of syntactic brackets, rooted in real-time processing: a left bracket marks the recognition of the category of an item and its storage in temporary memory, while a right bracket marks the retrieval of that item and its integration into a rigidly ordered thematic compositional structure. This identification, applied to the universal parsing process I describe, recovers almost exactly identical tree structures to current Merge-based accounts. This is surprising: what we had described with nested containment relations comes for free from algorithmic transduction of one sequence (of morphemes in surface word order) to another (a universal order of composition of those morphemes).

However, the structures generated by these dynamics of parsing are not quite identical to Merge trees. For example, limitations on word order (213-avoidance in thematic domains; Superiority among A-bar fillers) that require extra stipulations in the standard formulation fall out at once from this architecture. The theory also dispenses with the most problematic aspects of Merge-based theory, including linearization, labeling, and derivational ambiguity of non-ambiguous structures – not to mention the “special creation” cognitive operation Merge itself.