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Memory for Serial Recall explains Center Embedded Structure

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Abstract

A defining characteristic of human language is hierarchical recursion. Recursive loops (i.e. relative clauses) in sentences can either be embedded in a sentence or cross each other. It is still unknown why center-embedded (CE) recursion is ubiquitous among natural languages as in The boy A1 the dog A2 chases B2 falls B1 (A1A2B2B1), whereas crossed-dependent (CD) orderings of recursion hardly ever occur (A1A2B1B2). Our account of the preponderance of CE is based on retrieval mechanisms, especially mechanisms of serial recall. It explains that, under conditions that are characteristic for sentence comprehension, backward retrieval (retrieving dog(A2) first, and boy(A1) next, as required by CE) optimizes memory performance as compared to forward retrieval (boy(A1) first, and dog (A2) next, as required by CD). We test this account with independent serial recall data. Our analysis suggests that CE is better molded to human memory for serial recall than CD.