Neural Representation of Minimal Syntactic Units

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Presentation Abstract Summary One prevailing explanandum in linguistics is how human beings can create and understand an infinite number of novel sentences. The answer must hold for all languages and across all constructions in all languages. Despite the apparent complexity of the problem, Generative linguists claim that the answer can be reduced to a single, simply defined and implemented function, Merge. Merge takes two syntactic objects (e.g., words) and joins them together, forming a new, larger syntactic object, called a constituent. Previous work in this domain has focused on nominal constituents (e.g., `the dog'), despite how, theoretically, Merge is active generally. We demonstrate using fMRI and multi-voxel pattern analysis (MVPA) that Merge operates across other lexical categories (e.g., prepositions, `among friends'; verbs, `eat apples'; etc.). We train classifiers on brain scans corresponding to constituent (`the dog') and reversed, non-constituent (`dog the') pairs, and test on brain scans from unseen non-/constituent stimuli (`carry books', `smelly really'). Significant classification accuracy was obtained from a single subject, lending weight to the idea that the modeling of a behavior as complex as language need not be so complex itself.

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