Theme: Cognitive Neuroscience

Neural Responses to Affixation and Reduplication in Artificial Language Acquisition

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Abstract:
(The following abstract corresponds to an experiment that is still in its the initial stages in the laboratory.)
Acquiring language involves learning multiple overlapping regularities governing linguistic units such as words, phrases, and sentences. These regularities may pertain to identity, position, or relationships within linguistic structures. While infants become fluent in their native languages despite these complexities, our understanding of how learners extract and generalize grammatical regularities—especially when multiple regularities are encountered simultaneously—remains incomplete.

This study will examine how native Portuguese-speaking adults acquire morphological regularities in an artificial language, focusing on affixation and reduplication. Portuguese, characterized as a strongly suffixing language with minimal productive reduplication, provides a new context to explore these patterns. This study will evaluate whether electroencephalography (EEG) signals differ between affixation and reduplication conditions, and between onset and offset manipulations.

Using a within-subjects design, participants are exposed to 96 root pseudowords paired with images during familiarization, followed by test phases involving affixation or reduplication (depending on the condition) and foils. Pseudowords were constructed with a trigram-based algorithm to ensure naturalistic phonotactics. EEG is recorded during the learning and testing phases to analyse event-related potentials (ERPs), with a focus on components such as N400 and ELAN to capture neural responses to morphological manipulations.

We hypothesize that affixation, particularly suffixes, will be easier to learn than reduplication due to typological and cognitive factors. Similarly, sequence offsets are expected to be more salient and easier to process than onsets. These findings aim to illuminate the cognitive mechanisms underpinning artificial language learning and grammar acquisition.

Keywords: Rule-learning, Artificial Language Acquisition, ERP