Temporal Dynamics of Semantic and Form preactivation in Lexical Selection: An EEG Study

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Abstract

The theory of language prediction posits a competitive preactivation of semantic (meaning) and form (sound/grapheme) information, aiding in the selection of the most likely lexical candidate. Hypothetically, multiple semantic and form cohorts are preactivated before the actual lexical candidate is activated. This study explores this by examining young adults reading constrained sentences (discretely), with simultaneous electroencephalographic recording. Representational similarity analysis was conducted to assess word-specific, semantic-related, and form-related pair of sentences (focusing on the word preceding the expected word). To examine the temporality, cluster permutation and divergence point analyses were performed. The results indicated a semantic coactivation effect occurring before the phonological one and the recovery of the specific words. However, despite the phonological information being recovered before the word specific information, there were no significant differences in temporality. These findings indicate a semantic coactivation process for meaning selection during prediction, with form coactivation dependent on the expected word's selection.

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