Temporal Dynamics of Syntactic and Semantic Prediction

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Abstract

This dissertation reports on a study that examined the temporal dynamics and adaptive nature of syntactic and semantic prediction during Japanese sentence comprehension using event-related brain potentials. Two types of sentences, containing informational conflicts either between semantic and morphosyntactic information or between semantic information, were used. The former type involved argument role-reversal, as in *the window closes someone*, in which the subject is semantically plausible as a THEME but syntactic information signals it as an AGENT. The latter type involved an aspectually coerced sentence, such as *For ten minutes the dog jumped*.

The dissertation provides empirical evidence that structural and aspectual expectation develop as a function of time, even when available information does not change. Structural and aspectual mismatches modulate early effects (i.e. approximately 300–500 ms post-onset), such as left anterior negativity and anterior negativity, only when the time available for predictive computation is sufficient. By contrast, late effects, such as P600 and late anterior negativity are insensitive to the temporal predictability of structural and aspectual information, and may reflect later processes, such as structural and aspectual repair or revision processes. Finally, I discuss the adaptive nature of predictive processing on the basis of the finding that the expectation-related early anterior negativity gradually attenuated in syntactically complex sentences, but no in syntactically simpler sentences.