Early neuroelectric signatures of spoken-word recognition

Implications for studies of the phonology-grammar interface

Söderström, Pelle

3.5 The effects of sensory uncertainty on motor learning when both feedforward and feedback control processes are engaged

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A large body of literature shows that sensory uncertainty inversely scales the degree of error-driven corrections made to feedforward motor plans from one trial to the next. However, by limiting sensory feedback to the endpoint of the movement, these studies prevent corrections from taking place during the movement itself. Here, we show that when online feedback corrections are promoted, sensory uncertainty punctuates between-trial updating of motor plans with abrupt changes that closely track the degree of sensory uncertainty but are insensitive to the magnitude and direction of movement error. This represents a significant departure from the existing literature which consistently reports that sensory uncertainty inversely scales an error-dependent response. These results prompt important questions for current models of motor learning under uncertainty and open up new paths for future exploration.

4 Poster session II

4.1 Early neuroelectric signatures of spoken-word recognition: implications for studies of the phonology-grammar interface

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Spoken language is a continuous signal, from which we must extract individual words to ultimately understand our interlocutor. In this process, lexical candidates compete for recognition within 200 milliseconds of the onset of a word. The neuroelectric correlates of this process have not been widely studied. In a recent electroencephalographic study on word recognition in English (Söderström & Cutler, under review), we replicated results from Swedish, where an early event-related potential starting at 150 milliseconds from word onset has been suggested to reflect the probabilistically driven activation of possible word forms and early lexical match, as well as the pre-activation of linguistic material based on phonological cues (Söderström et al., passim). These findings have implications for models of spoken-word recognition and – more generally – linguistic predictions, especially in the phonology-grammar interface, providing promising testing grounds for lexical processing in less-studied languages.