

Impaired speech-motor control in stuttering affects EEG correlates of predictive speech comprehension

Thursday, July 21, 2022 2:50 PM (20 minutes)

In this study we tested the hypothesis suggesting that speech production processes support prediction during speech comprehension by investigating prediction processes in a population with impaired speech-motor control, i.e., adults who stutter (AWS). We reasoned that, if production and prediction are supported by common processes, people with impaired production should also show anomalous prediction. Participants listened to high vs low constraining (HC vs LC) sentence frames that made the final target word either predictable or not. Such paradigm allowed us to tap onto (a) prediction processes in a pre-target silent interval, comparing EEG alpha/beta power modulations in the HC vs LC conditions; and (b) the consequences of prediction, comparing the post-target N400 ERP in the LC vs HC conditions. In addition, participants were involved in a production task in which, after listening to the same HC and LC sentences, they were asked to name the picture corresponding to the target word. Compared to a control group of fluent speakers, AWS showed a different pattern of alpha/beta power modulations in the production task, compatible with their impairment. More interestingly, a difference was also observed in the comprehension task, and it was paired with a less accentuated post-target N400. Overall, the pattern supports the hypothesis that some aspects of speech production play a role in prediction during speech comprehension.

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Session Classification: Speech Processing

Track Classification: Predictive Processes and Statistical Learning