What’s, uhh, coming next? Effects of speech disfluency on event-related potentials during sentence processing

Speakers are more likely to produce disfluencies such as filled pauses (“uh”, “um”) before unpredictable words, making disfluency a potentially useful pragmatic cue during sentence processing. This event-related potential study investigates how filled pauses modulate the N400 – an index of lexico-semantic processing -- by crossing expectancy with disfluency. In addition, we ask whether and how listeners can adjust their use of disfluencies during processing, given only implicit information about the distributional characteristics of speech disfluencies over the course of an experiment. To do this, we manipulated the proportion of filler trials in which disfluencies preceded unpredictable versus predictable words between two participant groups. In one group of participants (reliable condition, n=24), disfluencies preceded unpredictable words (and predictable words were produced fluently) on 75% of all trials. In the other group (unreliable condition, n=24), disfluencies were equally likely to precede unpredictable and predictable words. Crucially, critical items were identical across both groups; the overall frequency of disfluency also did not differ between groups. Results showed that critical words following disfluencies elicited a larger-amplitude N400 than critical words in fluent sentences, regardless of expectancy. This suggests that disfluencies orient listeners' attention to upcoming speech, leading to deeper semantic processing of both expected and unexpected words. This effect was stronger in the reliable group (when disfluencies preceded unexpected words relatively often). This finding suggests that listeners are able to use the distributional characteristics of a speaker’s disfluencies to implicitly adjust how they use speech disfluency to influence semantic processing of incoming words.