

# Does perceptual chunking facilitate predictive processing in spontaneous speech?

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## Abstract

Surprisal theory holds that the processing difficulty of a word is determined by its predictability in context (Hale, 2001; Levy, 2008). However, memory limitations hinder the integration of the full context, as evidenced by dependency locality effects (Gibson 1998). We propose that the local context for predictive processing may be established by cortical tracking of perceptual chunks, which are periodically occurring linguistic units (Giraud & Poeppel, 2012). We identified perceptual chunks in 97 extracts of natural speech using behavioural data. For each word, we derived surprisal values from GPT-2 based on three contexts: the full extract, the current perceptual chunk, and the previous three words. Surprisal conditioned on the chunk context was higher than on the full extract but lower than on the previous three words. This suggests that perceptual chunking may offer an optimal window for predictive processing within working memory capacity.