PRIMING PROSODY: SPEECH RATE AND BOUNDARY PLACEMENT

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An ongoing question for theories of spoken language production is whether different aspects of prosody, such as intonational boundaries, speech rate, intonation, and pitch accenting are controlled by the same underlying representations. Contrary to this, recent work suggests that some aspects of prosody, like speech rate, can be primed (Jungers & Hupp, 2009) while others, like intonational boundaries, cannot (Tooley, Konopka, & Watson, 2014). This raises two possibilities. Either these two aspects of prosody are planned at different stages of processing and thus are likely controlled by different levels of representation, or this discrepancy reflects differences in experimental contexts.

To evaluate these possibilities, we used a prime-target paradigm to test whether boundary placement and speech rate of prime sentences can influence the production of new target sentences in one study. We orthogonally manipulated prime sentences (via cross-splicing) to either have an intonational phrase boundary or not (e.g. The monkey that stole the hat // refused to give it back) and to be either 10% faster or 10% slower than the natural speech of the original recordings (by resynthesizing them using Praat). Prime and target sentences always had the same syntactic structure.

64 participants listened to 20 prime sentences and repeated them aloud. One target trial followed each prime, where speakers silently read a novel sentence and repeated it aloud (Boundary Condition, Speech Rate, and Prime-target Order were fully counterbalanced). These trials were embedded in a list of filler trials, split evenly (and randomly) between listen-repeat or read-repeat sequences. Participants' boundary productions were assessed in two ways: one coder rated whether a boundary was discernible in the critical region or not, and a second coder measured the duration of the word produced before the boundary location through the onset of the first word following the boundary location. Total speaking time of each sentence was also measured.

The analysis of overall speaking times showed significant main effects of Boundary and Speech Rate, and a significant interaction between Speech Rate and Prime-target Order (all *p*s<.05). Participants tended to speak slower when they heard a boundary, and also spoke faster or slower when primed to do so, but this effect was smaller in the targets than the primes.

The analyses of perceived pauses and word-and-pause durations showed main effects of Boundary and Speech Rate, and interactions between Boundary and Prime-target Order (all *p*s<.05). Participants were more likely to produce a pause after hearing a slow-rate prime. They also paused at the critical region more often when they were primed to do so: this effect was highly reliable in the prime sentences, but only a weak effect persisted into the targets.

The results show that speech rate but not boundary placement can be primed across sentences, which is consistent with both Jungers and Hupp (2009) and Tooley et al. (2014). Thus rather than being an artifact of differences in experimental contexts, different cognitive mechanisms may underlie the planning and production of speech rate and boundary placement.