

Modulation of the following segment effect on coronal stop deletion

When coronal stops in consonant clusters are eligible for deletion (CSD), the segment at the beginning of the next word influences the deletion rate, with increased retention before vowels. Although this effect is large and well-replicated (Labov et al. 1968, Guy 1980, Patrick 1991, Santa Ana 1992, Tagliamonte & Temple 2005, *inter alia*), there is no clear consensus on how or why it arises. Different models of the mental representation of variation make different predictions about how such cross-word conditioning effects should interact with other aspects of language structure and use. In this paper we ask whether the following segment effect interacts with three other factors: word frequency, speech rate, and intervention of a clause boundary.

Given the **exemplar theoretic** prediction that allophonic biases should accumulate over time in high-frequency words, as spelled out in Pierrehumbert 2002, the magnitude of the following segment effect should increase as frequency increases. If CSD is primarily a fast-speech reduction process resulting from **gestural overlap**, as suggested in Ernestus 2014, increased speech rate should exaggerate the effect of the pre-consonant context by forcing greater amounts of overlap. Models emphasizing **production planning**, such as that proposed by Wagner 2012, predict that phonological following segment effects should be weakened across stronger syntactic boundaries (such as clauses) because in those cases the triggering segment may not always have been planned early enough to affect the variable.

The data were coded auditorily from 122 interviews with white working class speakers in the Philadelphia Neighborhood Corpus (Labov & Rosenfelder 2011). In order to simplify the analysis by controlling other relevant factors, we extracted from the larger dataset 1,289 monomorphemic, monosyllabic CSD tokens followed by a vowel or an obstruent. With reference to the transcript text, we coded whether a clause (CP) boundary intervened between the CSD token and the following word. Word frequencies were taken from SUBTLEX (Brysbaert & New 2009) and speech rate was calculated as vowels per second in the 7-word window surrounding the target word. We fit a logistic regression with, in addition to speaker gender and preceding segment, interaction terms for following segment by each of: log word frequency, log speech rate, and intervening clause. The regression results indicate that of these three factors, only speech rate shows a significant interaction with following segment ($\beta=0.88$, $z=-2.8$, $p=0.005$). The direction of the interaction is that as speech rate increases, the distinction between the pre-vowel and pre-obstruent contexts decreases.

Our results are not consistent with any of the predictions we outlined above from various models of CSD. The interactions we predicted based on exemplar theoretic and production planning approaches to variation were not significant, and while there is a significant interaction between speech rate and following segment it is not in the predicted direction. Rather, we suggest that these results may point to CSD as a phonological process with a grammatically-specified following context sensitivity that is only able to be fully realized in slower speech.

References

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