
How learning morpho-phonological relations affects phonetic encoding: Modeling the duration of morphemic and non-morphemic S

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Just recently, Plag, Homann, and Kunter (2017) showed that the duration of phonologically homophonous word final [s] in American English differs systematically between its morphological functions. The current paper further investigates the source of these durational differences. Specifically, we investigated [s] durations in the Buckeye Corpus and how they relate to the morphological function of word final [s] (e.g. non-morphemic, clitics (has, is), genitive singular, plural noun, third person singular, etc.). A Naive Discriminative Learning Model (cf. Arnold, Tomaschek, Sering, Ramscar, & Baayen, 2017) was trained to discriminate morphological functions by means of word and diphone cues and calculated activations and activation diversities for each morpheme. Our analysis shows that the more word final [s] supports a morphological function the longer it is articulated ($\beta = 0.76$, $t = 5.05$). At the same time, the larger the uncertainty about the morphological function, the shorter [s] is articulated ($\beta = -1.13$, $t = -20.39$). These results indicate that fine phonetic detail is affected by how strongly the phonetic signal is learned to be associated with a certain morphological function.

References: • Arnold, D., Tomaschek, F., Sering, K., Ramscar, M., & Baayen, R. H. (2017). Words from spontaneous conversational speech can be recognized with human-like accuracy by an error-driven learning algorithm that discriminates between meanings straight from smart acoustic features, bypassing the phoneme as recognition unit. PLOS ONE. • Plag, I., Homann, J., & Kunter, G. (2017). Homophony and morphology: The acoustics of word-final S in English. *Journal of Linguistics*, 53(1), 181–216.

