

The duration of word-final /s/ across morphological categories in English: Evidence from pseudowords

Previous research suggests that homophonous affixes show systematic differences in their phonetic realization ([1], [6], [8], [7]). Such findings pose a challenge for theories of speech production ([5], [4]) as it is unclear how morphological information would come to influence articulation.

One prominent example is word-final /s/ in English. Previous research found durational differences between clitics, suffixes, and non-morphemic final /s/. However, while experimental studies ([10], [8]) found suffix /s/ to be longest, corpus studies ([11], [6], [9]) found that non-morphemic /s/ is longer than suffix and clitic /s/, and suffix /s/ being longer than clitic /s/.

The interpretation of these contradictory findings is difficult. The results of the corpus studies rely on unbalanced data sets, while experimental results depend on rather small data sets. In all cases, previous results were subject to potentially confounding effects of lexical and contextual properties of the items under investigation, e.g. storage effects ([3]).

To address these concerns, the present study uses pseudowords to investigate potential durational differences between non-morphemic, plural, and *has-* and *is-*clitic /s/. A sentence production task was carried out in which speakers produced almost 1200 pertinent forms.

Linear mixed effects regression analyses show a significant effect of type of /s/ on /s/ duration (see Figure 1). The differences between the different types of /s/ pattern as in the corpus studies.

The present study shows that durational differences between different types of /s/ are of a robust nature rather than a by-product of confounding factors. This leads to the conclusion that morphological information may influence speech production in such a way that systematic subphonemic differences arise. This calls for revisions of current models of speech processing in which morphology does not play a role in later stages of production.

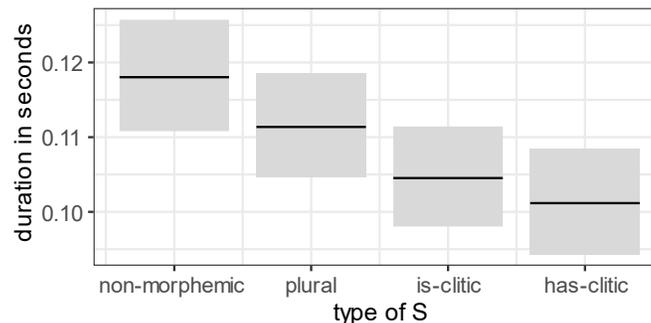


Figure 1. *Partial effect of type of /s/ on /s/ duration in the final linear mixed regression model.*

References

- [1] BEN HEDIA, S. & I. PLAG. 2017. Gemination and degemination in English prefixation: Phonetic evidence for morphological organization. *Journal of Phonetics* 62, 34–49. doi: 10.1016/j.wocn.2017.02.002
- [2] CASELLI, N. K., M. K. CASELLI, & A. M. COHEN-GOLDBERG. 2016. Inflected words in production: Evidence for a morphologically rich lexicon. *Quarterly Journal of Experimental Psychology* 69 (3), 432-454. doi: 10.1080/17470218.2015.1054847
- [3] LEVELT, W. J. M., A. ROELOFS, & A. S. MEYER. 1999. A theory of lexical access in speech production. *Behavioral and Brain Science* 22 (1), 1-75. doi: 10.1017/s0140525x99001776
- [4] LEVELT, W. J. M., & L. R. WHEELDON. 1994. Do speakers have access to a mental syllabary? *Cognition* 50.1, 239–269. doi: 10.1016/0010-0277(94)90030-2
- [5] PLAG, I., J. HOMANN & G. KUNTER. 2017. Homophony and morphology: The acoustics of word-final S in English. *Journal of Linguistics* 53 (1), 181–216. doi: 10.1017/S0022226715000183
- [6] PLAG, I., LOHMANN, A., BEN HEDIA, S., & ZIMMERMANN, J. 2019. An <s> is an <s'>, or is it? Plural and genitive-plural are not homophonous. To appear in Körtvélyessy, L. & Stekauer, P. (Eds.) *Complex Words*. Cambridge: Cambridge University Press.
- [7] SEYFARTH, S., M. GARALLEK, G. GILLINGHAM, F. ACKERMANN, & R. MALOUF. 2017. Acoustic differences in morphologically-distinct homophones. *Language, Cognition and Neuroscience*, 1-18. doi: 10.1080/23273798.2017.1359634
- [8] TOMASCHEK, F., I. PLAG, R. H. BAAYEN & M. ERNESTUS. 2019. Phonetic effects of morphology and context: Modeling the duration of word-final S in English with naïve discriminative learning. *Journal of Linguistics*, 1–39. doi: 10.1017/S0022226719000203
- [9] WALSH, T., & F. PARKER. 1983. The duration of morphemic and non-morphemic /s/ in English. *Journal of Phonetics*. 11 (2), 201-206. doi: 10.1016/S0095-4470(19)30816-2
- [10] ZIMMERMANN, J. 2016. Morphological status and acoustic realization: Findings from NZE. In Carignan, Christopher and Michael D. Tyler (eds.), *Proceedings of the Sixteenth Australasian International Conference on Speech Science and Technology (SST-2016), Parramatta, Australia, 6–9 December 2016*. Canberra: ASSTA, 201-204.