

## **Subphonemic differences between different types of /s/ in English: Evidence from pseudowords**

Recent research suggests homophonous affixes show systematic differences in their phonetic realization (e.g. Ben Hedia & Plag 2017, Seyfarth et al. 2017). Such findings pose a challenge for theories of speech production (e.g. Levelt et al. 1999) because it is unclear how morphological information would come to influence articulation.

A prominent case is English word-final {s}, which can express a number of morphological categories and clitics. Previous research on durational differences between these types of {s} found differences between clitics, suffixes, and non-morphemic /s/. However, there is no agreement on the nature of these differences. Experimental studies, e.g. Seyfarth et al. (2017) for North American English, found non-morphemic realizations to be shorter than suffix /s/. In contrast, corpus studies on New Zealand English (Zimmermann 2016) and North American English (Plag et al. 2017) find results of the opposite direction: the duration of /s/ is longest in non-morphemic contexts, shorter with suffixes, and shortest in clitics.

The interpretation of these contradictory findings is difficult. The results of the corpus studies rely on unbalanced data sets due to the nature of corpora, while experimental results depended on rather small data sets. In all cases, results were subject to potentially confounding effects of lexical and contextual properties of the items under investigation, e.g. storage effects (e.g. Caselli et al. 2016).

To address these concerns, the present study uses pseudowords to test whether there are durational differences between non-morphemic, plural, and the *has-* and *is-*clitic /s/. A production study with forty native speakers of Southern British English was carried out, adopting Berko-Gleason's (1958) pseudoword paradigm. Speakers produced almost 1200 pertinent forms in a sentence production task with carefully controlled stimuli consisting of 48 monosyllabic pseudowords.

Linear mixed effects regression analyses show a significant effect of type of /s/ on /s/ duration. The differences between the types of /s/ pattern as in the corpus studies: the duration of /s/ is longest in non-morphemic contexts, shorter with suffixes, and shortest in clitics.

The findings can be interpreted as follows. Durational differences between different types of /s/ are not caused by unbalanced distributions in corpus data as similar results are found in controlled experimental data. Additionally, such differences cannot be a result of lexical properties affecting the realization of the /s/ since we tested pseudowords, for which no lexical representation was available. Hence, the realization of /s/ in pseudowords appears to be subject to the same paradigmatic and contextual effects that have been discerned by Tomaschek et al. (2019) for real words.

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. Thus, differences in /s/ durations are due to the processing of the morphological information encoded in the pertinent type of /s/. Hence, 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.

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