

Morpho-phonetic detail influences listeners' comprehension

Recent research has shown that seemingly homophonous elements show unexpected effects of morphological structure. For example, word-final /s/ in English is longest in non-morphemic contexts, shorter with suffixes, and shortest in clitics (e.g. Plag et al., 2017; Schmitz et al., 2021). Such findings raise the question whether listeners are sensitive to subphonemic detail, and if so, whether such subsegmental information may influence lexical access.

Previous research (Kemps et al., 2005a, 2005b; Blazej & Cohen-Goldberg, 2015) showed that listeners are sensitive to the acoustic correlates indicating whether a stem is part of a suffixed word or not. The present paper tests whether listeners are sensitive to the durational differences of plural vs. *is*- and *has*-clitic /s/ in English, that is, whether they make use of the subtle morphological information that is part of the signal.

We used a number-decision task in a mouse-tracking setup comparable to that of Blazej & Cohen-Goldberg (2015). To rule out potentially confounding effects of lexical properties (e.g. Caselli et al., 2016; Gahl, 2008) or contextual effects (e.g. Klatt, 1976; Wightman et al., 1992), all target words were pseudowords identical to those used in the production study of Schmitz et al. (2021). Two types of stimuli were used in the experiment: matched and mismatched. Matched stimuli consisted of stems and endings from one category (e.g. a plural stem glued to a plural /s/). Mismatched stimuli combined a substring from one category (e.g. a plural stem) with the ending from another category (e.g. an *is*-clitic /s/). All items were embedded in carrier sentences. The verb following the target word disambiguated between non-clitic (i.e. plural /s/), and *is*- and *has*-clitic /s/ (e.g. plural: “the pruks ate”; *is*-clitic: “the pruk’s eating”; *has*-clitic: “the pruk’s eaten”). The expectation was that, if subphonemic detail influences processing, the mouse-tracks of the mismatched items should be different from those of the matched items already before the following verb form disambiguates.

The x and y coordinates of the mouse-tracks were analysed using smooth additive quantile regression models (Fasiolo et al., 2021). The analysis shows that the type of stimuli, i.e. matched vs. mismatched, indeed significantly affected the comprehension of word-final /s/, leading to a detour of the mouse-tracks for mismatched stimuli.

The present results demonstrate that listeners are influenced by the subtle acoustic differences in the stimuli. As all items were pseudowords, our results cannot be explained by potentially confounding lexical effects or contextual effects. That is, listeners can perceive subphonemic morpho-phonetic detail and make use of such information in comprehension. This result has important theoretical implications. Models of language production and comprehension do not account for morphological detail in the acoustic signal (e.g. Booij, 1983; Kiparsky, 1982; Roelofs & Ferreira, 2019; Turk & Shattuck-Hufnagel, 2020). This paper adds to the literature that calls for more adequate models.

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