Reconsidering pseudowords in morphological research

Pseudowords are important evidence in research on morphology and the mental lexicon at least since Berko-Gleason's wug tests (Berko-Gleason, 1958), and they are used to test the reality of morphological rules or patterns. Pseudowords are popular because they are assumed to have the advantage of removing storage effects and effects of lexical relatedness that might interfere with the productive morphological capacity of speakers.

Along the same lines of reasoning, pseudowords are commonly assumed to be semantically 'empty shells' (e.g. Frisch et al., 2000; Günther, 1983; Turcsan & Herment, 2015). However, results of recent studies suggest that (mono-morphemic) pseudowords may indeed carry some sort of meaning (Chuang et al., 2020; Kawahara et al., 2018). Needle & Pierrehumbert (2018) show that speakers' implicit knowledge on associating words to speaker gender is also generalized to gender associations of complex pseudowords. Such findings suggest that semantic features of pseudowords may be conditioned by their phonological and morphological form. And even below the word level, there is evidence that pseudowords resonate with the words in the established lexicon. For instance, studies on sound symbolism have shown that certain vowel qualities are semantically connected to shapes (e.g. Kawahara et al., 2018; Maurer et al., 2006), and that there are sound-meaning pairings (phonaesthemes, see Plag & Balling, 2020, for an overview) which may contribute to a pseudoword's meaning.

The present study tests the hypothesis that the resonance of morphologically complex and simplex pseudowords with the words in the lexicon influence the processing of these pseudowords. The hypothesized effect in processing is measured by investigating the duration of word-final S, which, in the pseudowords under study, is either non-morphemic or represents plural. The duration of final S in real words has been repeatedly shown to differ between different kinds of S, and these differences can be taken to reflect processing differences. Most recently, Schmitz et al. (2020) replicated such effects with pseudowords. Using that data set, this study tests whether the durational difference between plural S and non-morphemic S found by Schmitz et al. in their pseudowords can be predicted by means of measures derived from the semantics of these pseudowords.

We will adopt the general methodological approach developed by Chuang et al. (2020), who used a Linear Discriminative Learning network (LDL, e.g. Baayen et al., 2019) to investigate mono-morphemic pseudowords. We proceeded as follows. We trained an LDL model on real word data, mapping their phonological forms onto their semantic representations (as taken from distributional semantic models). Using the resulting mapping function we derived vectors representing the semantics of pseudowords based on the phonological similarity of the pseudowords with words in the lexicon. Measures derived from these semantic vectors of pseudowords were then used in a regression model to predict the duration of final S in the pseudowords. These measures turned out to be significant predictors for the difference in the durations of plural vs. non-morphemic word-final S.

Our results mean that the morpho-phonetic properties of pseudowords are dependent on their resonance with the existing lexicon. Contrary to a widely-held belief, pseudowords do not live in their own world, only interacting with 'grammar'. The assumption of semantically empty pseudowords appears to be a fallacy. Pseudowords make contact with the lexicon and carry meaning due to their formal similarity with real words. The existence of semantically non-empty pseudowords leads to three crucial consequences. First, for past studies, there might be a potential influence of pseudoword semantics on the reported results. Second, for future studies, experimental designs and analyses should take potential semantic effects into account. Finally, the very notion of pseudoword and the dichotomy of pseudoword vs. real word needs to be reconsidered.

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