

Word and root representations in the spontaneous production of regularly inflected words

There is an asymmetry in the literature regarding the status of whole-word representations in perception and production. While there is extensive evidence for the involvement of both whole-word and root representations in visual word recognition (see, Amenta & Crepaldi 2012 for a review), far less evidence exists for whole-word representations in spoken production. Indeed, the major theories of spoken production adopt a compositional approach to morphological production (Dell, 1986; Levelt, Roelofs & Meyer, 1999). In this study we examined whether there is evidence for morpheme-based representations, whole-word representations, or both in spontaneous American English speech.

To do so, we capitalized on the finding that in monomorphemic words lexical frequency is correlated with phonetic duration, with higher frequency words tending to have shorter durations (e.g., Gahl, Yao, & Johnson, 2012). We analyzed the Buckeye corpus of spontaneous speech and found that whole-word and root frequency independently predict the duration of words suffixed with *-ing*, *-ed*, and *-s*, even when numerous factors are controlled. Both root and word frequency correlated with shorter duration. This indicates that both root and word representations play a role in the production of inflected English words.

Because frequency effects could arise at several levels of processing, we conducted a second analysis in order to assess the locus of the frequency effects. Research on monomorphemic words has shown that neighborhood density is correlated with phonetic duration, with high-density words tending to have shorter durations than low-density words (Gahl, Yao & Johnson, 2012). For this analysis, we extracted the set of monomorphemic CVC words contained in the Buckeye corpus. For each word, we calculated both monomorphemic neighborhood density and *inflected neighborhood density*—that is, the number of inflected words that differ from the target by one phoneme. We found that both monomorphemic and inflected neighborhood density significantly influenced the duration of monomorphemic CVC words, though the effects went in opposite directions. While greater monomorphemic density led to shorter durations, greater inflected density led to longer durations. These results suggest that whole-word representations exist at same level of processing that leads to neighborhood effects, most likely a pre-phonological lexical level.

Together, these findings indicate that morpheme-based and whole-word representations are stored for inflected words in production and that these representations exist at lexical levels. The evidence is particularly compelling given that we examined inflected English words, which are thought to be *less* likely to have whole-word representations than derived words (e.g., Stanners, Neiser, & Painton, 1979). Finally, we discuss reasons why monomorphemic and inflected neighborhood density may have opposite effects on phonetic duration.

Reference

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