A link between phonology and the lexicon: Morphophonological exceptionality and decomposition in English stress shift

Introduction: When phonological rules apply across the boundary between a stem and an affix, there is some variation in whether or not the affix will follow the same pattern as the stem. Some affixes pattern with the stem, following the same phonological restrictions, while other affixes have a tendency to demonstrate phonologically exceptional behavior (Elkins, 2020). These exceptional affixes are usually analyzed as being detached from the stem, and are typically placed in separate phonological domains. Additionally, the exceptionality associated with affixes is often unsystematic, with some affixes cohering to the stem phonologically, while others do not. This leaves open questions about what leads an affix to behave exceptionally. Namely, when can we expect an affix to cohere or not cohere to the stem, and which factors are correlated with each of these possibilities? This study seeks to answer these questions by proposing a connection between phonologically exceptional affixes and morphological decomposition in the lexicon. The results of a corpus study on English suffixes show that phonological exceptionality is correlated with lexical factors like decomposability, suggesting a relationship between morphological decomposition in the lexicon and phonological exceptionality.

Background: A link has been proposed between linguistic behaviors of individual affixes, and how likely those affixes are to be decomposed from their stems in the lexicon. Though decomposition is an abstract process, several studies have shown that particular variables such as frequency, are able to predict differences in morphological behavior that coincide with decomposability. Hay (2001), and Hay & Baayen (2002, 2003) show that a comparison between the frequency of a complex word and the frequency of its stem (known as relative frequency) makes strong predictions about whether a complex word will be decomposed into its composite morphemes. Specifically, when a stem is more frequent than the derived form, it is more likely to be decomposed (e.g. *movement* is likely to be decomposed because the stem *move* is more frequent than the derived form *movement*). When the derived form is more frequent than the stem, the complex word is likely to be accessed as a whole, without decomposition (*judgment* is more frequent than its stem *judge*, so it would be accessed whole, without decomposition).

Hay and Baayen (2003) also find that decomposability is highly correlated with particular phonotactic probabilities, demonstrating a connection between decomposability and the phonological grammar. They show that affixes which result in the creation of low-probability phonotactic sequences between stems and affixes are more likely to be decomposed during lexical access. They posit that the reason for this is that low-probability sequences are interpreted as word boundaries in speech perception, which leads to a higher likelihood that the stem and affix will be decomposed in lexical access.

Corpus study: Given that phonological information like phonotactics can be used to interpret locations of word boundaries, I ask whether phonological alternations have the same effect on decomposability. To answer this question, a corpus study (Sánchez-Gutiérrez et al., 2018) was performed to investigate whether higher rates of morphological decomposition are linked to phonologically exceptional affixes. This was investigated using the process of English stress shift (Kaisse, 2005). In this pattern, main stress is placed on the rightmost stressed syllable which has another syllable after it (e.g. díalèct, rígìd). When suffixes attach to these words, the rightmost stressed syllable will no longer be the initial syllable, resulting in primary stress shifting to the last syllable of the root word (e.g. dìaléct-al). Stress shifting proceeds normally for some suffixes (cohering suffixes), but there are some that do not trigger stress shift (non-cohering suffixes, e.g. díalèct-hood, not dìaléct-hood). If phonological exceptionality and

morphological decomposition are indeed linked, we should find that an affix which patterns separately from the stem phonologically is also more likely to be decomposed from the stem in the lexicon.

Results: Results show that decomposition indicators like relative frequency are able to predict whether an English suffix will pattern with the stem (cohering), or not pattern with the stem (non-cohering/exceptional). As predicted by the hypothesis, when a suffix's tendency to decompose is higher, there is also a higher likelihood that the suffix will be non-cohering, not patterning with the stem phonologically ($\breve{\beta}$ = 1.67, SE = 0.60, z = 2.77, p = 0.006).

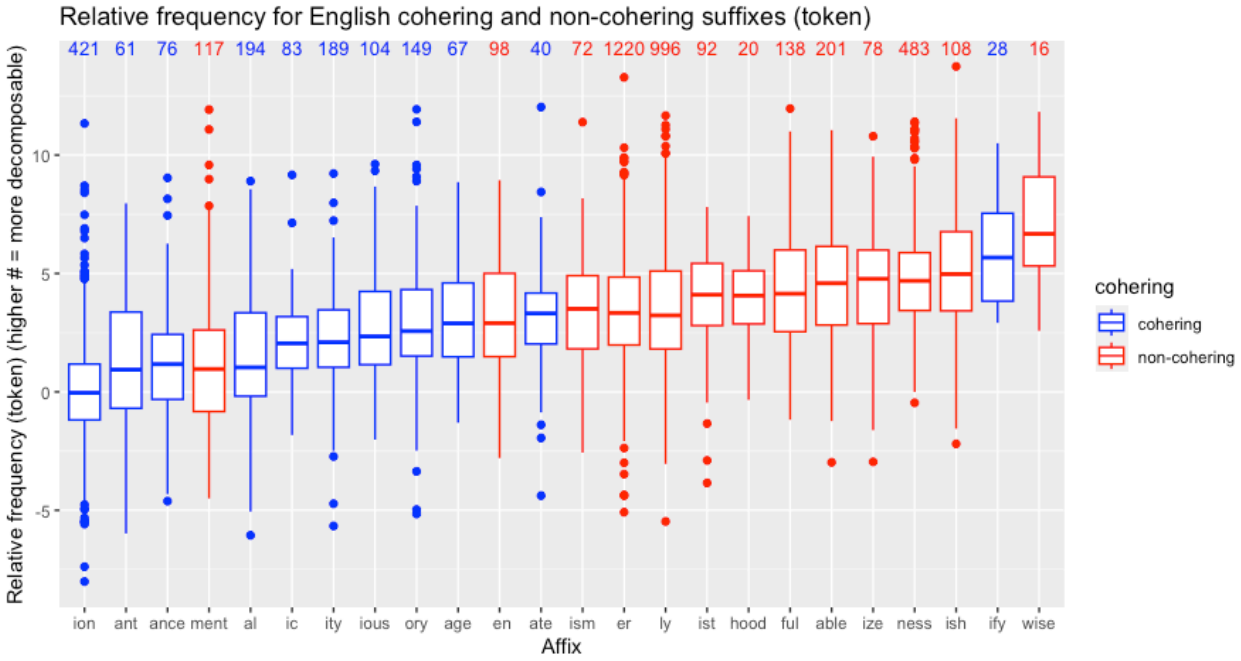

Figure 1: A plot of average decomposability for cohering and non-cohering English suffixes, indicated by token relative frequency (a comparison between frequency of the stem and affixed forms of a given word). Blue boxplots show average decomposability for words with cohering suffixes, while red boxplots show decomposability for words with non-cohering suffixes. The numbers above the boxplots indicate the number of data points that each calculation is based on from the corpus.

Discussion: This finding sheds light on why some, but not all affixes, behave as if they are in separate phonological domains from the stem, and supports a strong link between the phonological grammar and the way in which words are represented in the lexicon. Furthermore, it extends Hay and Baayen's (2003) findings, showing that like phonotactics, exceptions in phonological alternations also inform speakers about the locations of potential boundaries between words and affixes, which is reflected in their storage in the lexicon. Additional analyses of a pattern involving English prefixes, and a preliminary analysis on Malay prefixes suggests that this pattern may represent a broader cross-linguistic relationship between lexical storage and phonological exceptionality.

Selected references: Elkins, N. E. (2020). Prefix independence: typology and theory. Master's thesis, University of California Los Angeles; Hay, J. (2001). Lexical frequency in morphology: is everything relative? *Linguistics* 39–6 (2001), 1041–1070; Hay, J., & Baayen, H. (2002). Parsing and productivity. *Yearbook of morphology 2001*, 203-235; Hay, J., & Baayen, H. (2003). Phonotactics, parsing and productivity. *Rivista di Linguistica*, 15.1 (2003), p. 99-130