Phonetic correlates of prefixedness in 8 varieties of English

Sarah Hawkins[1], Jennifer Hay[1], Rachel Smith[3], Jane Stuart-Smith[3]
[1]University of Cambridge, [2]University of Canterbury, [3]University of Glasgow
sh110@cam.ac.uk, jen.hay@canterbury.ac.nz, Rachel.Smith@glasgow.ac.uk, Jane.Stuart-Smith@glasgow.ac.uk

There is increasing evidence that morphological differences in phonemically-identical word parts are reflected in their phonetic realisation (Plag & ben Hedia, 2017). Prefixes are of especially interesting because, if they are identifiable in or close to real time, they could focus attention onto a small cohort of possible words, so facilitating comprehension. Experiments with carefully-controlled SSBE *dis-* and *mis-* stimuli show that this is indeed the case (Smith, Baker & Hawkins, 2012); Hawkins 2011): prefixed words beginning *dis-* or *mis-* are phonetically distinct from matched non-prefixed forms, and listeners are sensitive to this distinction. But we do not know to what extent a distinction is maintained across all words, and the range of contexts typical of conversational speech. Further, questions have been raised as to what extent words are affected by frequency rather than prefix status, and whether all varieties of English make the morphological distinction in the same way.

We examined polysyllabic words beginning with *dis-* and *mis-* (excluding those with primary stress e.g. *discus*) in corpora of 8 varieties of English: standard New Zealand English (NZE) (ONZE/Quakebox); Maori-identified speakers of NZE (MAONZE); vernacular and standard Glasgow (Sounds of the City); Liverpool, Skelmersdale and St Helens (OLIVE); and USA (Buckeye). 1140 words were measured (719 unprefixed); 199 word types from 509 speakers. Measures were: segment durations, ratios of segment durations, F1 and F2 frequencies in vowels, and spectral moments of /s/, word frequency, and length in syllables. Principal Components (PC) Analysis (acoustic measures z-scored within Corpus and Gender), revealed 3 PCs. PC1 is durational; PC2 */s/* spectral properties; PC3 vowel quality (F2-F1). Word frequency did not contribute. LMER models fit to each PC tested for effects of Corpus x Prefixedness, using two types of analysis: a binary code (prefix vs non-prefix), and a gradient measure derived from native-speaker ratings of how 'prefixed' each word sounds. (These ratings showed two distinct categories, each broad enough and with enough intermediate judgments to merit further analyses in terms of both binary and gradient classifications.) The results showed that PC1 (duration), is a robust and stable predictor, consistent across corpora, which reflects the difference between prefixed and non-prefixed categories, as well as gradience within them. The association of PCs 2 (/s/ Spectrum) and 3 (vowel Formants) with prefixedness is more variable across corpora, but both show association with prefixedness in parts of the data, usually in a way that reflects gradient category membership. Analyses within each corpus also reveal sociolinguistic variation. For example, males and females use the acoustic properties differently within several corpora.

This corpus work confirms that Smith *et al.'s* results showing phonetically-distinct prefixed and unprefixed forms generalise well to conversational speech. Each dialect reflects the morphology in its phonetics, but using the available acoustic properties to different degrees. Native intuitions about morphological gradience are also reflected in the phonetics.

Hawkins, S. (2011). In *Proceedings of the 17th International Congress of Phonetic Sciences*. Hong Kong: http://www.icphs2011.hk/ICPHS_CongressProceedings.htm.

Plag, I., and ben Hedia, S. (2018). The phonetics of newly derived words: Testing the effect of morphological segmentability on affix duration. In *Expanding the Lexicon.* Eds. S. Arndt-Lappe, A. Braun, C. Moulin & E. Winter-Froemel. (Berlin, New York: de Gruyter Mouton).

Smith, R., Baker, R., and Hawkins, S. (2012). *J. Phonetics* 40**,** 689-705.