Aspiration and the gradient structure of English prefixed words

Kie Zuraw
University of California, Los Angeles

Sharon Peperkamp
Laboratoire de Sciences Cognitives et Psycholinguistique
(DEC-ENS, EHESS, CNRS, PSL Research University)

English voiceless stops

Aspirated
• beginning of stressed syll.: po[tʰ]á.to
• beginning of word: [pʰ]otá.to

Otherwise unaspirated

Previous research on prefixed words
• [2, 5]: 8 prefixed words (mistimes, distrusts) vs. 8 pseudoprefixed (mistakes, displayed)
• Phonetic differences suggest morpheme boundary forces syllable boundary
• mis.[rʰ]times vs. mi.s[t]akes

Our goal: use larger set of words, so that we can...
• include words with intermediate morphological status
• test for frequency effects

Methods
• 16 native speakers of English
• 110 targets beginning with mis- or dis-
• 330 fillers beginning with pre-, re-, i[n,m,l,r]-, or co[n,m,l,r]-
• Target and filler words range from prefixed to pseudoprefixed
• Participant reads aloud a two-word phrase shown on computer screen
  • target trial: she disperses
  • filler trial: a commandment
• 440 trials per participant
• Two dependent variables, two regression models
  • continuous: Voice Onset Time (VOT) measured from waveform
  • binary: English-speaking author judged aspiration (yes/no)

Results

• Binary model: Most words were consistent across participants

![Graph showing the number of target words never aspirated (dis[pʰ]osed, mis[t]akes) vs. the proportion of codable tokens aspirated.]

but many words varied (dis[pʰ]osed, dis[kʰ]aimers, dis[pʰ]osition)

• Aspiration was common even when first syllable of stem unstressed:
  suggests stem-initial consonant is treated as prosodic-word-initial

• Both models: Frequency conjecture of [5] upheld

![Graph showing the effect of word frequency on VOT.]

Frequent word → less aspiration

Details of plots above
• COBUILD frequencies from [1]
• plots show frequency factors that were significant in generalized linear mixed-effects models of both binary judgments and continuous VOT (stem’s lemma freq. had smaller, negative effect, in VOT model only)
• partial-effects plots from a VOT model with fixed effects only

Conclusions and further directions

• Many items varied across participants, suggesting intermediate degrees of prefixed-ood
  → Is there also variation within speakers?
• More prefixed behavior (aspirated) if stem is more frequent, and more whole-word behavior (unaspirated) if whole word is more frequent, supporting [5]'s conjecture: competition between whole-word treatment and prefixed treatment
  → Is this competition a real-time race in production?
• Priming study underway to address both questions

References