

### Introduction

- *Convergence*, increased similarity to an interlocutor, is one source of evidence for phonetic details in phonological representations
- Can phonetic convergence be lexically specific, or is there only evidence for convergence at a phonological level?
- Some indirect evidence for lexically-specific convergence: lower frequency words exhibit more convergence in some studies (e.g. Goldinger 1998), though not others (e.g. Pardo et al. 2013)
- When a shifted characteristic is consistent across stimuli, a shift is extended to the same sound in new words and even to other sounds with shared characteristics (e.g. Nielsen 2011)
- In two studies, I examine the possibility of lexically-specific convergence
  - Can apparent frequency-conditioned convergence be obtained purely as a result of repetition effects interacting with lexical frequency? *Yes!*
  - Can word-specific convergence be obtained when different words are manipulated in opposing directions? *No evidence for it.*

### Methodology

**Study 1:** Testing whether repetition-based shifts can produce the appearance of frequency-based lexically-specific convergence when comparing speakers

- 24 female native speakers of English
- Read a set of 120 English words twice in randomized order
- *Not exposed to any other speaker*
- Each participant's two productions were compared to the second production of every other participant (24 iterations, one with each participant as the reference speaker)
- Speakers were measured as 'converging' when their second production of a word was more similar to the reference speaker's

**Study 2:** Testing whether lexically-specific convergence can be elicited when manipulation differs by word; this provides a direct test of lexically-specific convergence

- 24 female native speakers of English
- Read a set of monosyllabic words in randomized order before and after the task
- In the shadowing task, they repeated after 36 acoustically manipulated target words in randomized order, each of which was presented three times
- An equal number of words with each manipulation (vowel duration, F2 in /u/); the manipulation was always the same for the three repetitions of the same lexical item, e.g. *boot, brute, hoot, moose, shoes, zoo* with raised F2, and *boost, coed, choose, do, fruit, hoop* with lowered F2

### Selected References

- Goldinger, S. (1998) Echoes of echoes? An episodic theory of lexical access. *Psychological Review*, 105, 251-279.
- Nielsen, K. (2011). Specificity and abstractness of VOT imitation. *Journal of Phonetics*, 39, 132-142.
- Pardo, J., Jordan, K., Mallari, R., Scanlon, C., & Lewandowski, E. (2013). Phonetic convergence in shadowed speech: The relation between acoustic and perceptual measures. *Journal of Memory and Language*, 69, 183-195.
- Shriberg, E. (2001). To 'err' is human: Ecology and acoustics of speech disfluencies. *Journal of the International Phonetic Association*, 31(1), 153-169.

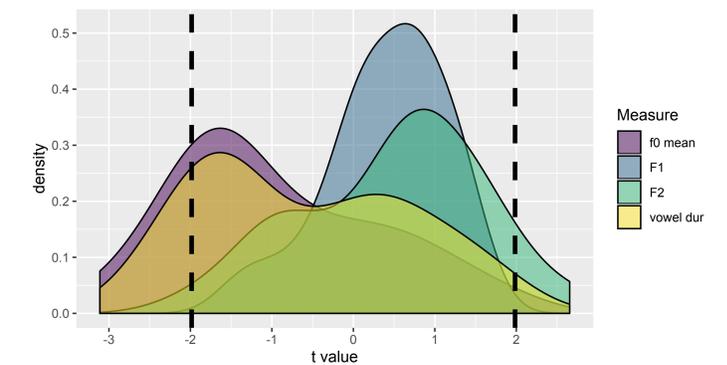
### Study 1: Frequency effects from repetition

Repetition produced the appearance of lexically conditioned convergence, though participants had not heard any other speaker

8/96 models found significantly more convergence with lower frequency words (lexical frequency as a negative predictor), while only 1/96 models found the opposite

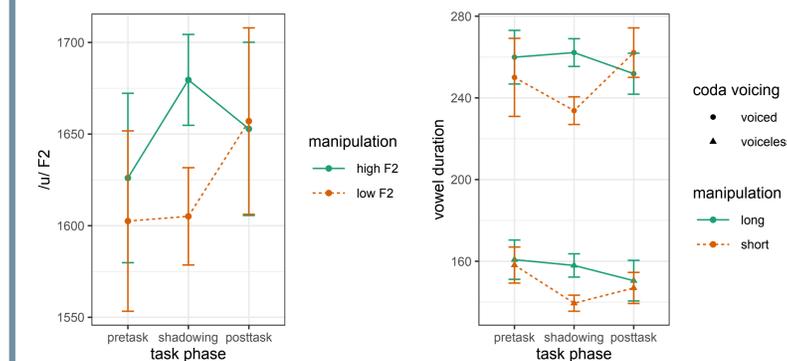
These models tested log lexical frequency as a factor predicting 'convergence'

Negative values were common for vowel duration and F0, while F1 and F2 were closer to being centered at zero



**Figure 1:** T-values for lexical frequency as a predictor of change in distance from the reference speaker. Dashed lines indicate the significance threshold.

### Study 2: Lexically-specific manipulations



**Figure 2:** Means and 95% CI by task phase, characteristic measured, and manipulation: (a) /u/ F2, (b) vowel duration.

No pre-task difference between words in each condition

The manipulation did influence productions during immediate shadowing:

- Higher F2 in /u/ when repeating a word with raised F2 than one with lowered F2
- Longer vowel duration when repeating words with long vowels than short vowels, both with a voiced coda and voiceless coda

In contrast, *there was no effect of either manipulation on post-task productions.*

### Conclusions

**Unreliable baseline productions result in frequency-based artefacts:**

- Study 1 demonstrates that apparent frequency-conditioned convergence can be found as an artefact of frequency-conditioned repetition effects in production
- Low frequency words have lower fluency than other words in initial productions, and subsequent more fluent productions will be more similar to other speakers' productions
- The characteristics that seem prone to this artifact – duration and F0 – are also strongly influenced by hesitations and other disfluencies (e.g. Shriberg 2001)

**No evidence for lexically specific convergence:**

- Study 2 provides no evidence for lexically-specific convergence; when listeners are exposed to stimuli with lexically-specific manipulations, they don't learn which words are manipulated in which direction
- Moreover, the results in Study 1 provide a possible explanation for previous results finding apparent lexically-specific convergence