



# WORD-SPECIFIC CONVERGENCE AND EFFECTS OF REPEATED EXPOSURE

CHELSEA SANKER SANKER@STANFORD.EDU  
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## Introduction

Can phonetic convergence be word-specific, suggesting word-specific phonetic details in the representation?

- Some studies find more convergence in lower frequency words (e.g. Goldinger 1998)
- But this is indirect evidence, and several studies fail to replicate it (e.g. Pardo et al. 2013)

Some apparent word-specific effects may be due to repetition rather than characteristics of the exposure stimuli (cf. Sanker 2021)

### This study:

- How Voice Onset Time (VOT) is impacted by repeated exposure and the word-specific VOT of exposure items
- *VOT shortening in words with shortened VOT exposure, no change in words with lengthened VOT exposure*
- *Suggests a role both of word-specific exemplars as well as reduction due to recent exposure*

## Methodology

### Participants

24 native speakers of American English

### Task

#### • Initial reading

Each word read individually in randomized order  
24 target words for analysis

#### • Exposure phase

Vowel duration categorization task. Listeners heard 8 words, each appearing 9 times (3 vowel durations; same VOT each time). Three exposure conditions (balanced for each word across participants):

- lengthened VOT (mean 137 ms), 4 items
- shortened VOT (mean 51 ms), 4 items
- no auditory exposure, 16 items

Half high-frequency words (e.g. *town, pet, could*), half low frequency (e.g. *tomb, peep, cull*)

#### • Post-task reading

Listeners read the same words again, individually in randomized order

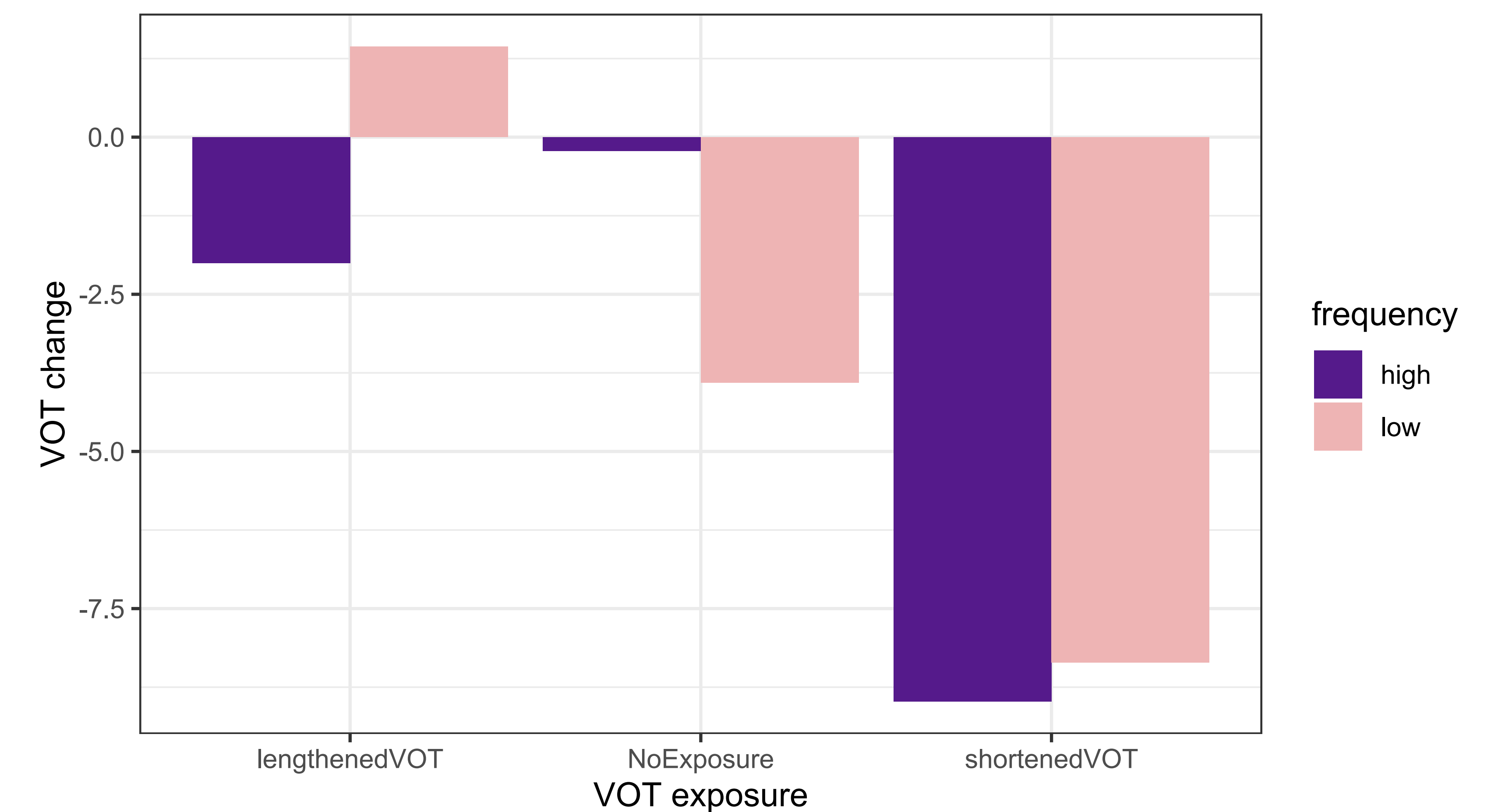
## Regression model

	Estimate	SE	t value	p value
(Intercept)	-0.216	2.07	-0.104	0.917
VOTmanip Long	-1.82	3.43	-0.532	0.595
VOTmanip Short	-8.72	3.43	-2.54	0.0112*
LexFrequency Low	-3.69	2.1	-1.76	0.0797
VOTmanip Long * LexFrequency Low	7.21	5.0	1.44	0.15
VOTmanip Short * LexFrequencyLow	4.23	5.0	0.847	0.397

**Table 1:** Linear model for change in VOT. *Reference Levels: VOTmanip = NoExposure, LexFrequency = High.* Random intercepts for participant and word.

Significant VOT shortening in words heard with shortened VOT (relative to no auditory exposure)  
No significant effect for words heard with lengthened VOT

## Effects of exposure condition (and frequency)



**Figure 1:** VOT change by exposure condition and lexical frequency

Shortening in words with shortened VOT exposure

No significant effects of lexical frequency, but a trend towards different effects for words in the lengthened VOT exposure condition

## Conclusions

### Word-specific phonetics

- Evidence for word-specific convergence
- Exemplar model, with phonological-level and lexical-level groupings (Pierrehumbert 2002)
  - Word-specific shifts are possible, but require sufficient consistently distinct exposure to a small number of words (cf. Rochet-Capellan & Ostry 2011 with altered auditory feedback)
  - Not all phonetic variation across words depends on word-specific phonetic details in the representation

### Amount of exposure

- Previous work with consistent VOT across words (e.g. Nielsen 2011) finds convergence to lengthened VOT in aspirated stops. Why no lengthening here?
- Two competing effects:
  - Long VOT in exposure stimuli, lengthening VOT
  - Recent exposure allows rapid retrieval, shortening VOT

## References

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