

# Early readers' knowledge of phoneme-to-grapheme correspondences affects individual speech sound processing

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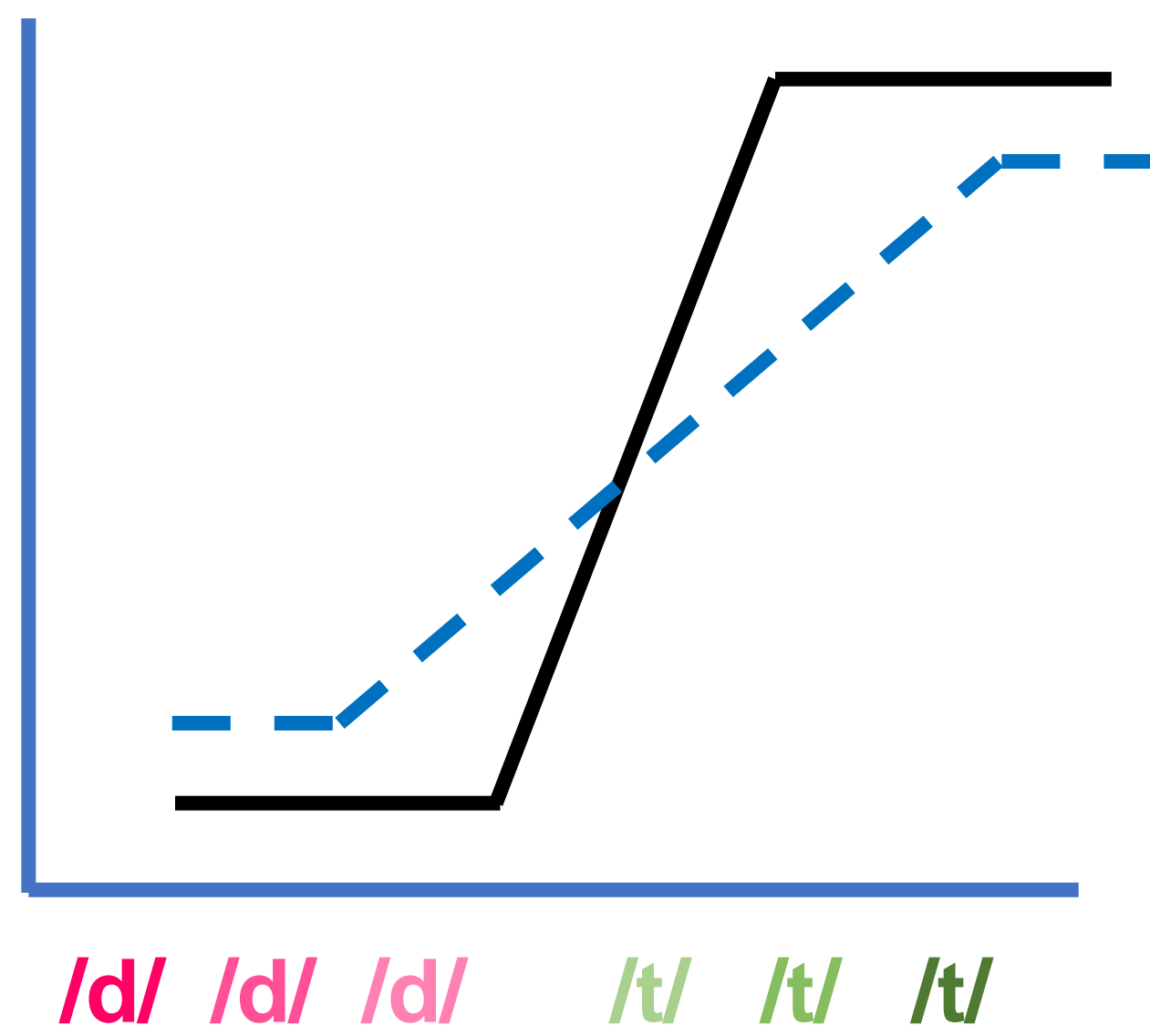
## Reading Acquisition (RA) affects...



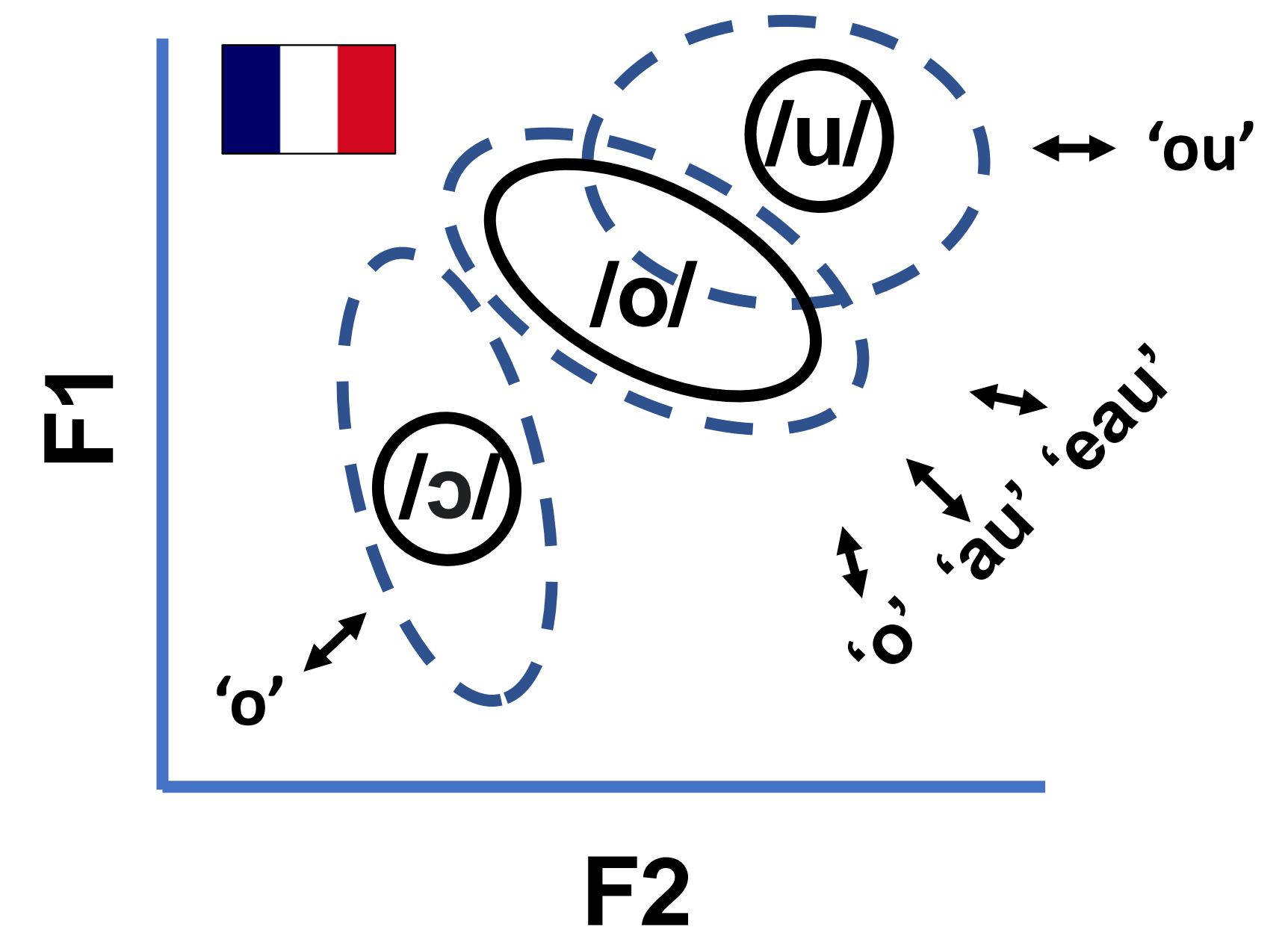
### Speech Perception

... Before RA — After RA

Reading Hypothesis  
(Burnham, 2003)



### Speech Production



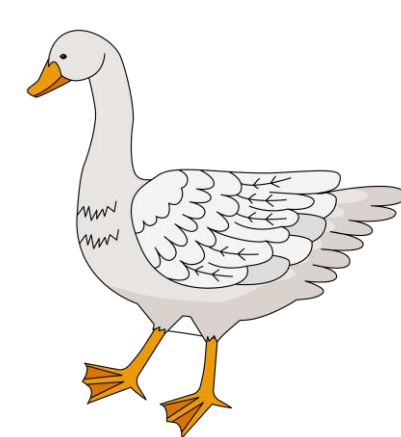
Vocal Tract Growth  
(Ménard et al., 2007)

## Orthographic (In)consistency

Spoken words with consistent spellings recognized faster than those with inconsistent spellings  
(Ziegler & Ferrand, 1998)

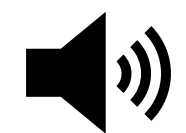


vs.



globe

goose



/əʊb/

/u:s/



<obe>

<oose>

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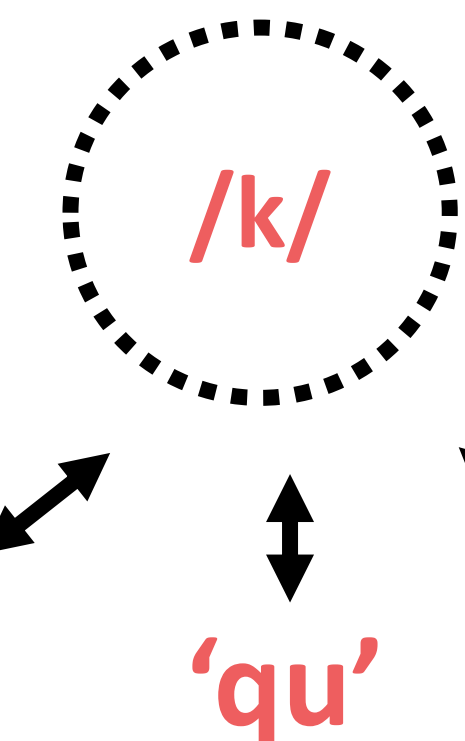
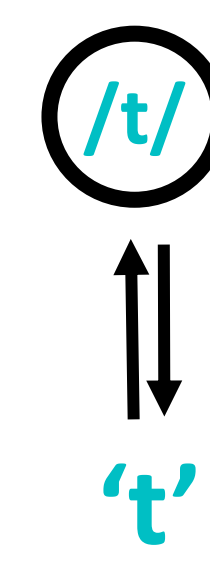
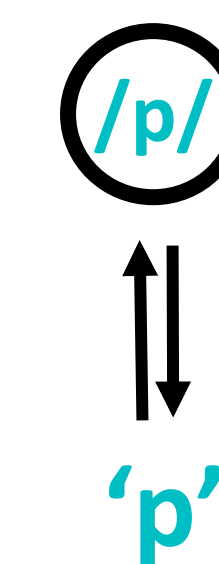
## Speech Sound Representations

Are phoneme representations malleable?



CONSISTENT SOUNDS

INCONSISTENT SOUND



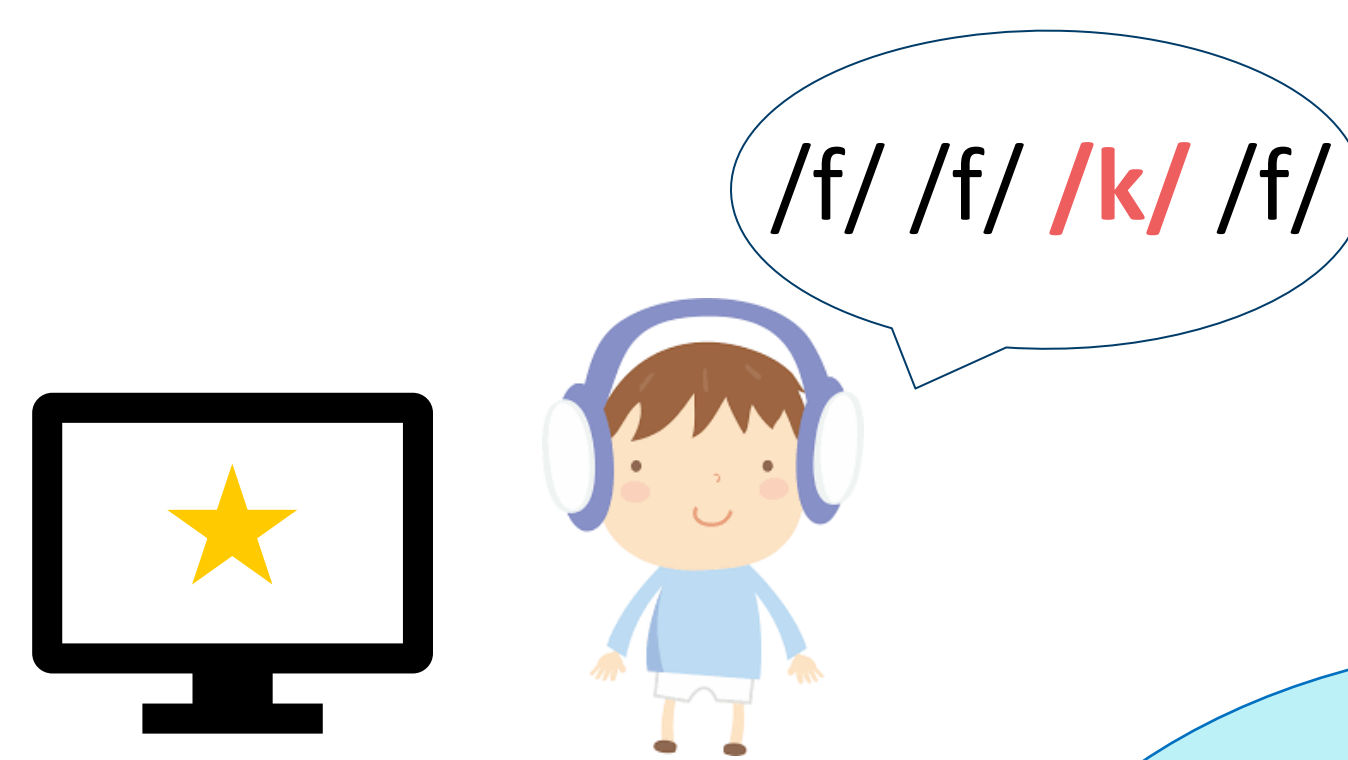
The present study explored whether orthographic knowledge affects already formed representations of speech sounds and hence speech perception & production

## Speech Perception Task

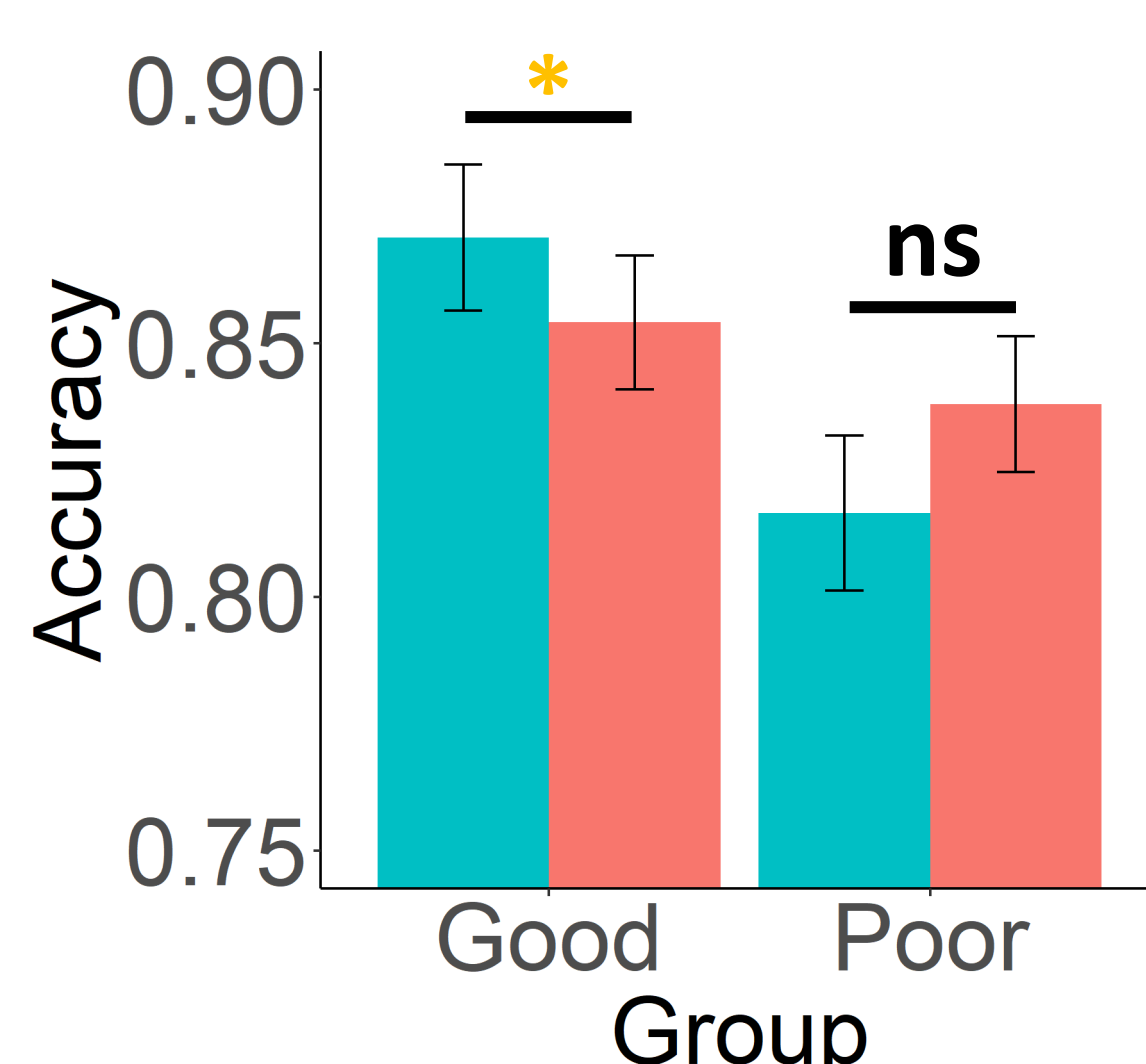
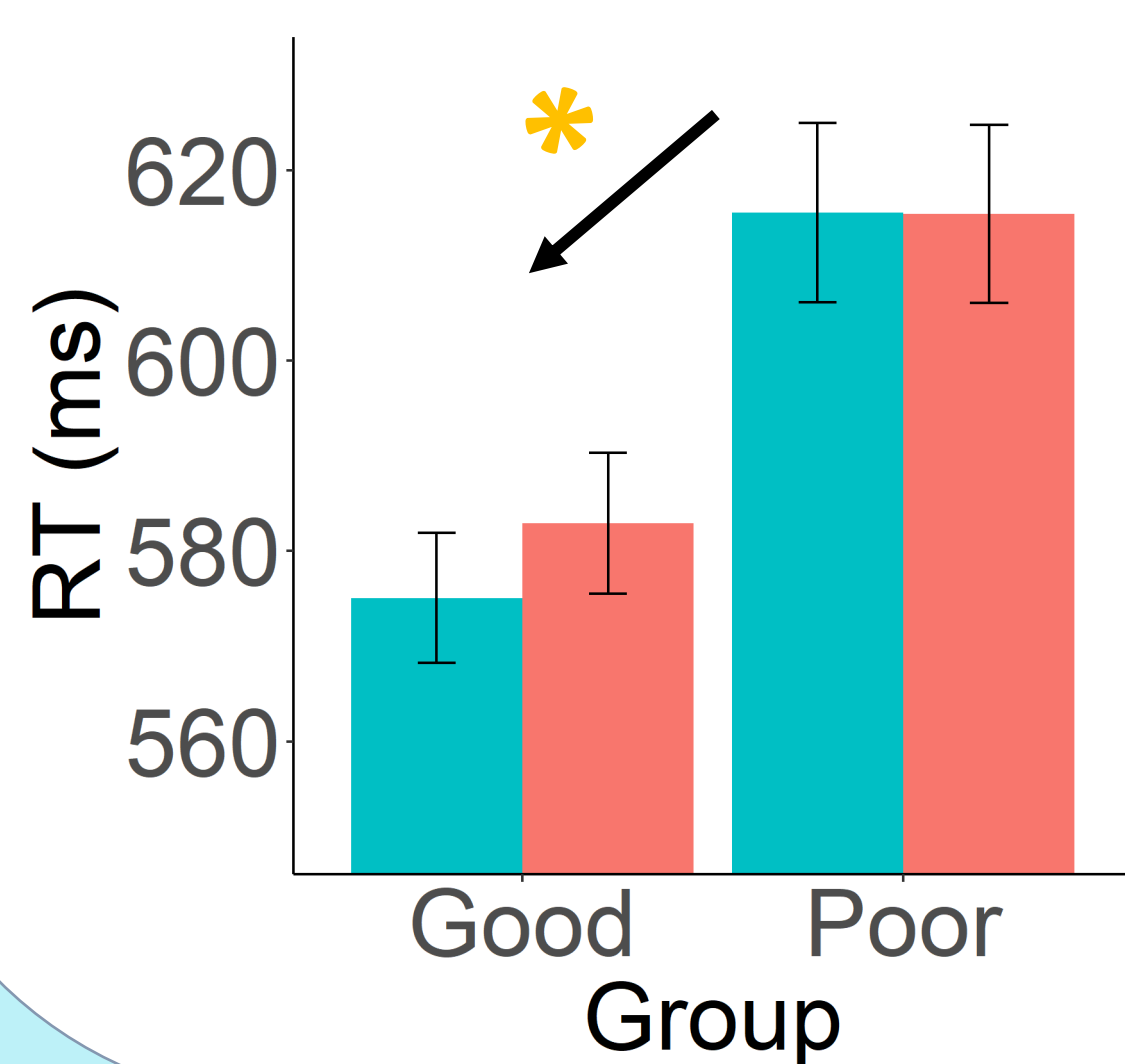
Consistent vs Inconsistent sounds as deviants

/f/ /f/ /f/ /k/ /f/ /f/ /f/  
/f/ /f/ /f/ /t/ /f/ /f/ /f/

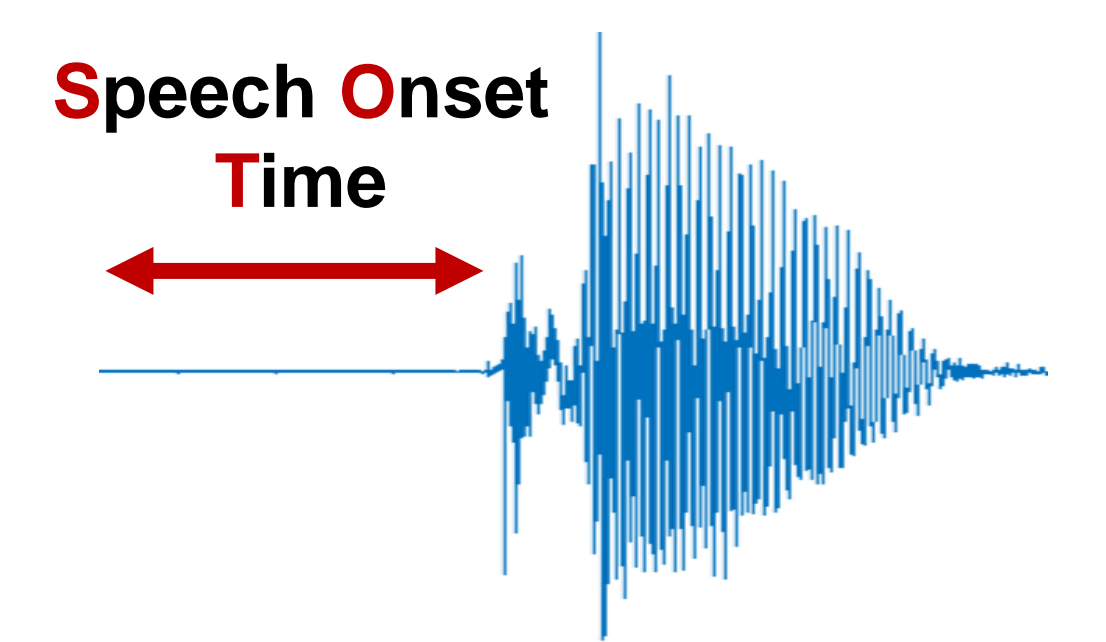
ns



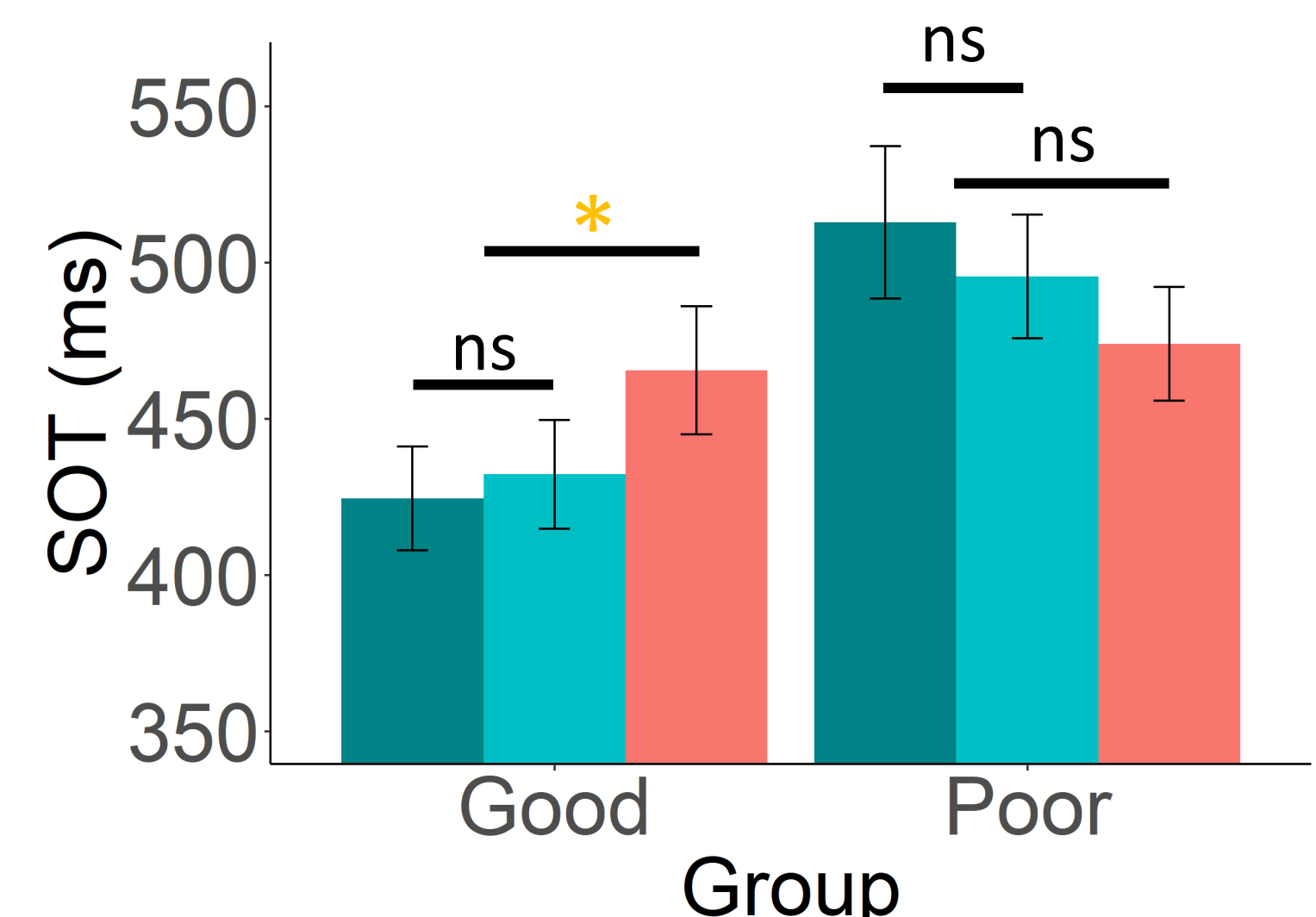
( $\beta = .285$ ,  $SE = .136$ ,  $z = 2.10$ )



## Speech Production Task



( $\beta = -.047$ ,  $SE = .017$ ,  $t = -2.81$ )



Speech Sound

- /p/
- /t/
- /k/

Already formed representations of speech sounds are malleable and can be influenced by the orthographic code

Orthographic knowledge affects both the perception and production of individual speech sounds in beginning readers

## References

Burnham, D. K. (2003). Language specific speech perception and the onset of reading. *Reading and Writing*, 16, 573–609.  
Ménard, L., Schwartz, J. L., Boë, L. J., & Aubin, J. (2007). Articulatory-acoustic relationships during vocal tract growth for French vowels: Analysis of real data and simulations with an articulatory model. *Journal of Phonetics*, 35(1), 1–19.  
Ziegler, J., & Ferrand, L. (1998). Orthography shapes the perception of speech: The consistency effect in auditory word recognition. *Psychonomic Bulletin & Review*, 5(4), 683–689.