

## Background

- One method of accommodating for the lack of invariance in the speech signal is by using lexical information to guide perception, which can lead to persistent changes in the mapping to speech sounds [2, 4].
- There is variability in the degree to which people adapt to this variability [1, 3, 5].
- Do individuals with weaker language abilities show deficits in lexically guided perceptual learning? If so, does this deficit reflect decreased lexical access or an impaired learning mechanism?**

### Weaker lexical access

The degree to which individuals rely on the lexicon is variable [3].

Lexically guided perceptual learning may be mediated by receptive language ability [1].

### Impaired learning mechanism

Children with language impairment show stronger a Ganong effect, demonstrating increased reliance on the lexicon [5].

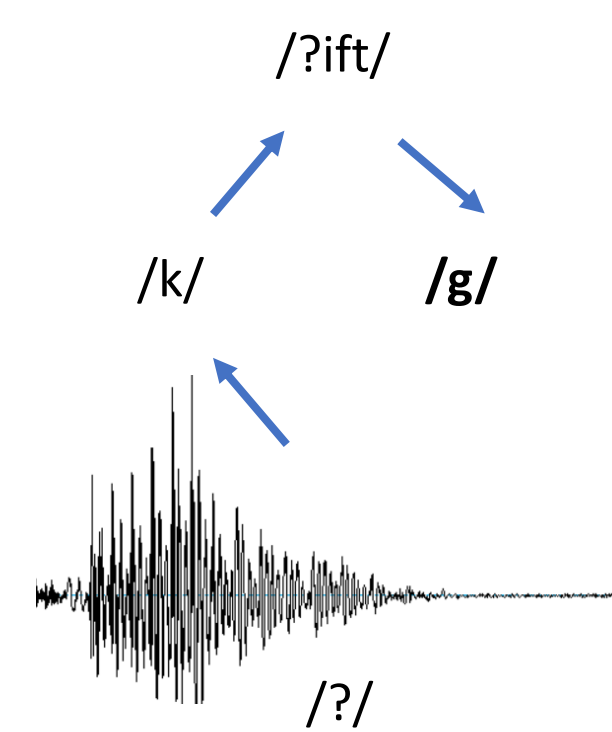
Language impairment is associated with learning deficits in other domains, such as word learning [6].

## Method

- Participants ( $n = 62$ ) completed two tasks including a lexical recruitment task (Ganong) and a lexically guided perceptual learning task (LGPL).
- Participants also completed standardized measures of language ability (CELF) and nonverbal intelligence (TONI).

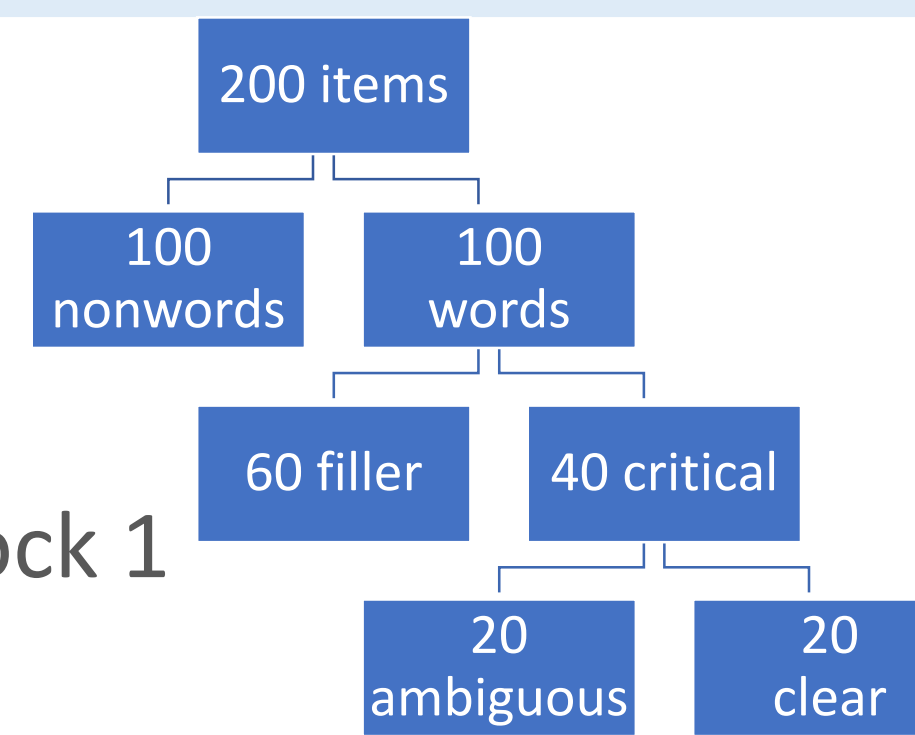
### GANONG

- Stimuli consisted of tokens from two word/non-word VOT continua, *gift-kift* and *giss-kiss*.
- Participants indicated whether each item began with /g/ or /k/.
- The Ganong effect will manifest as more /k/ responses for the *giss-kiss* compared to the *gift-kift* continuum.

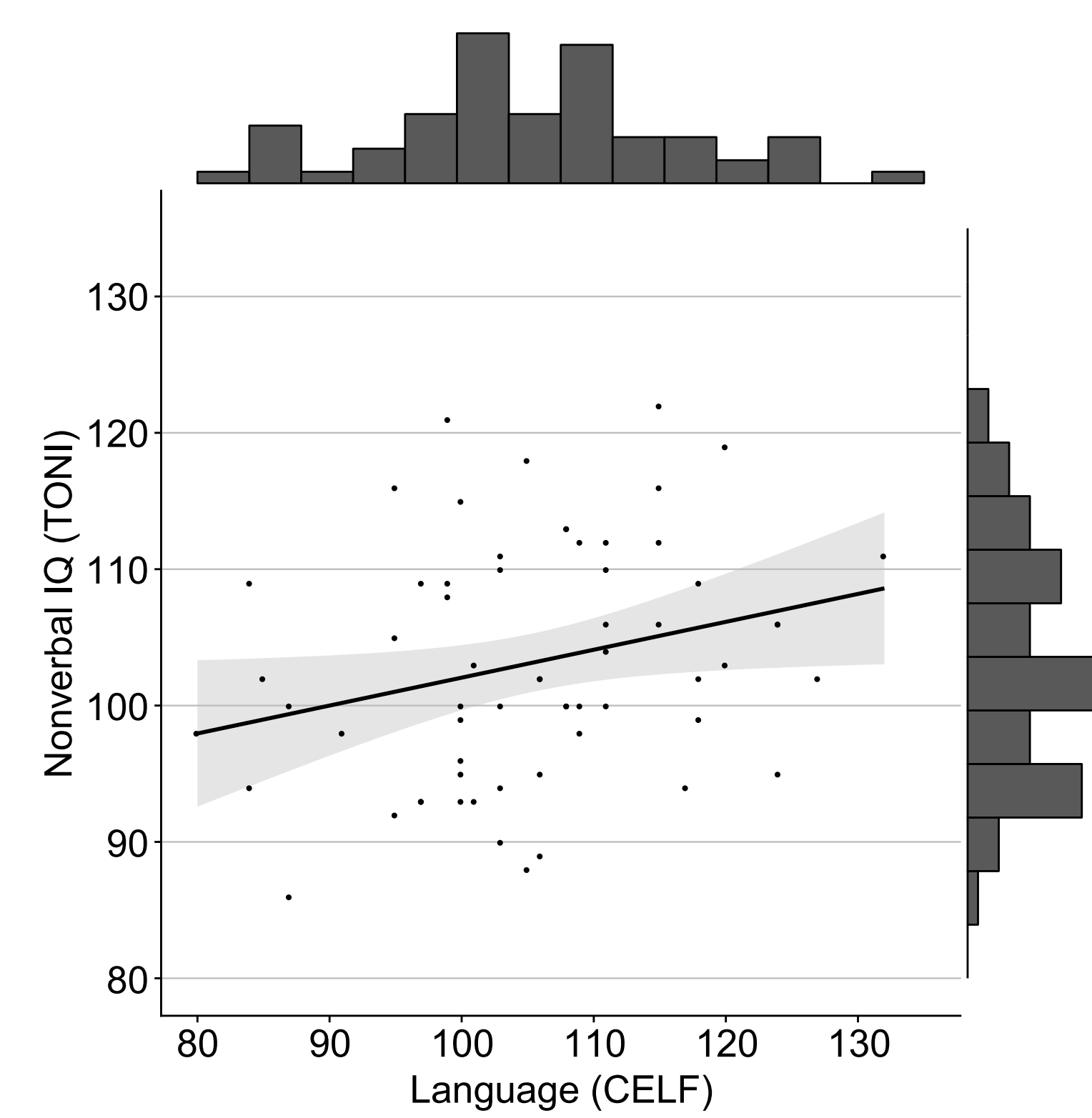


### LGPL

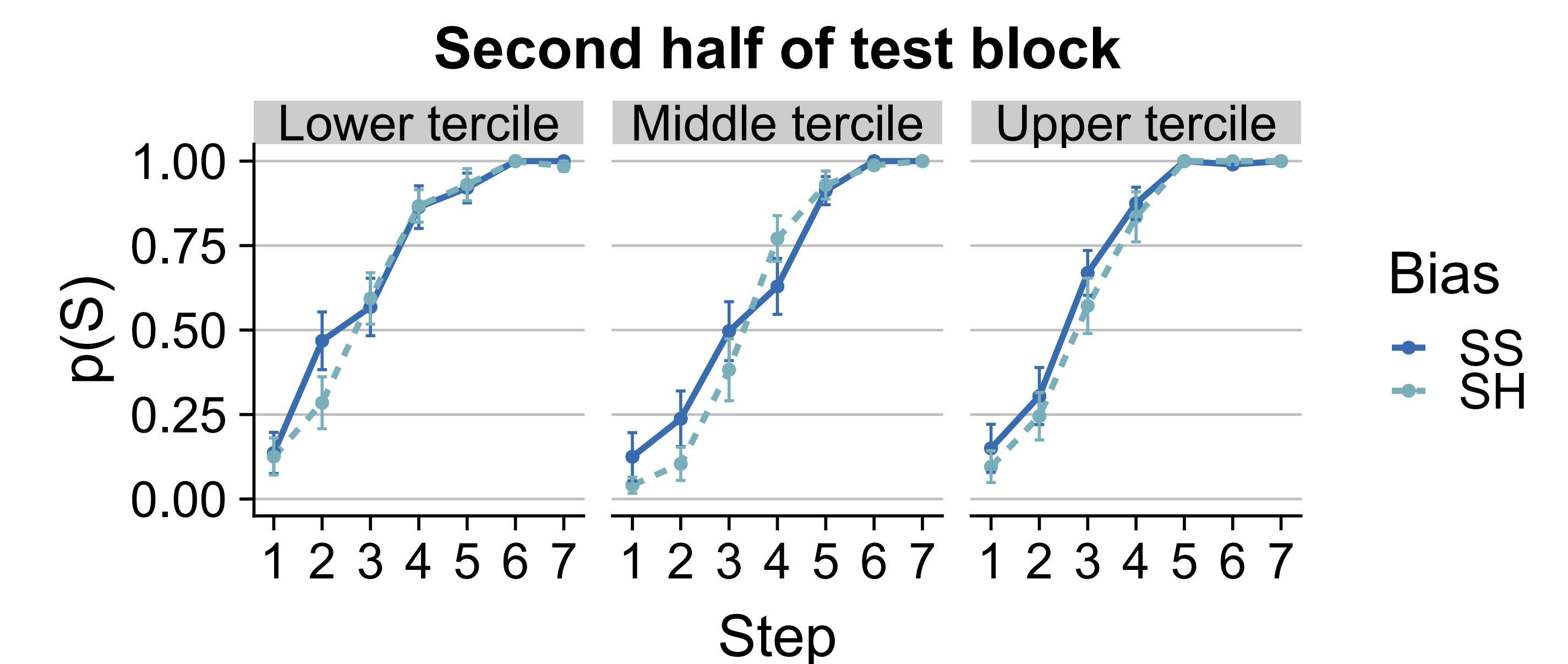
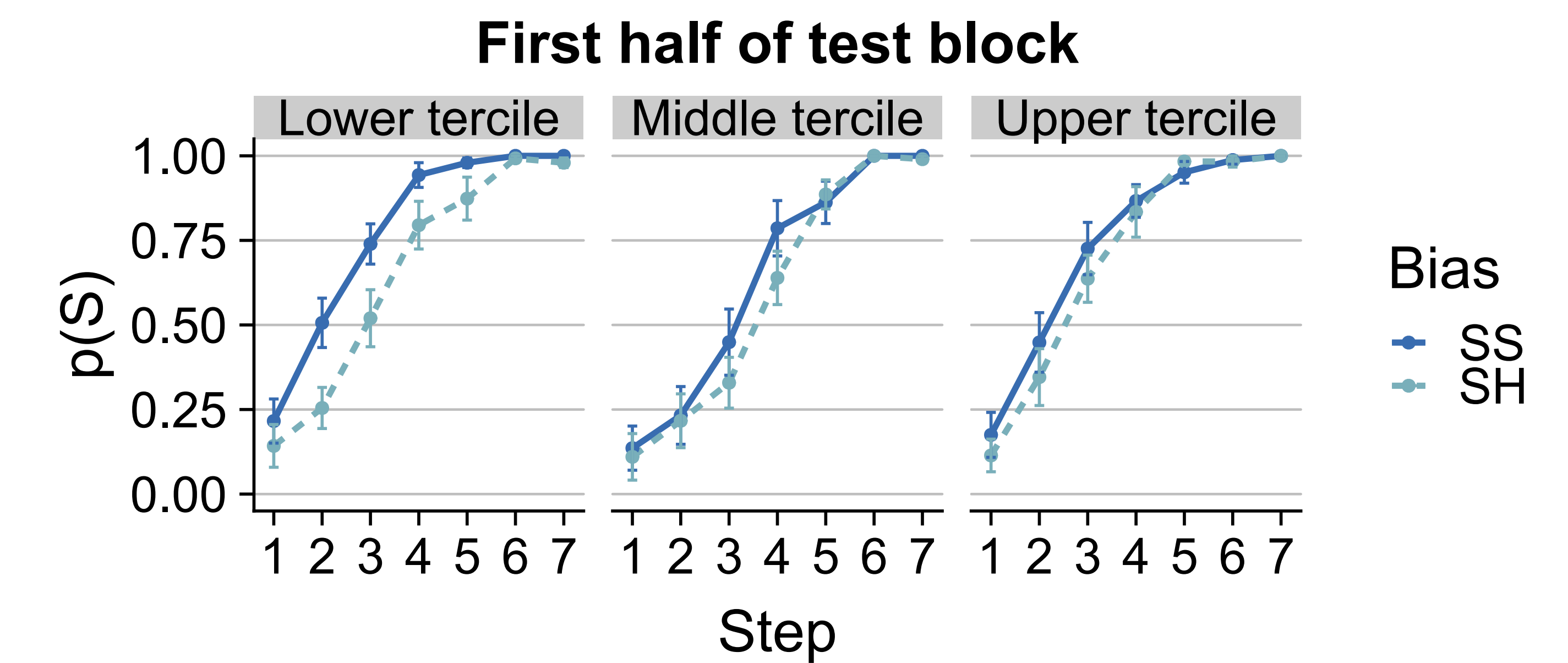
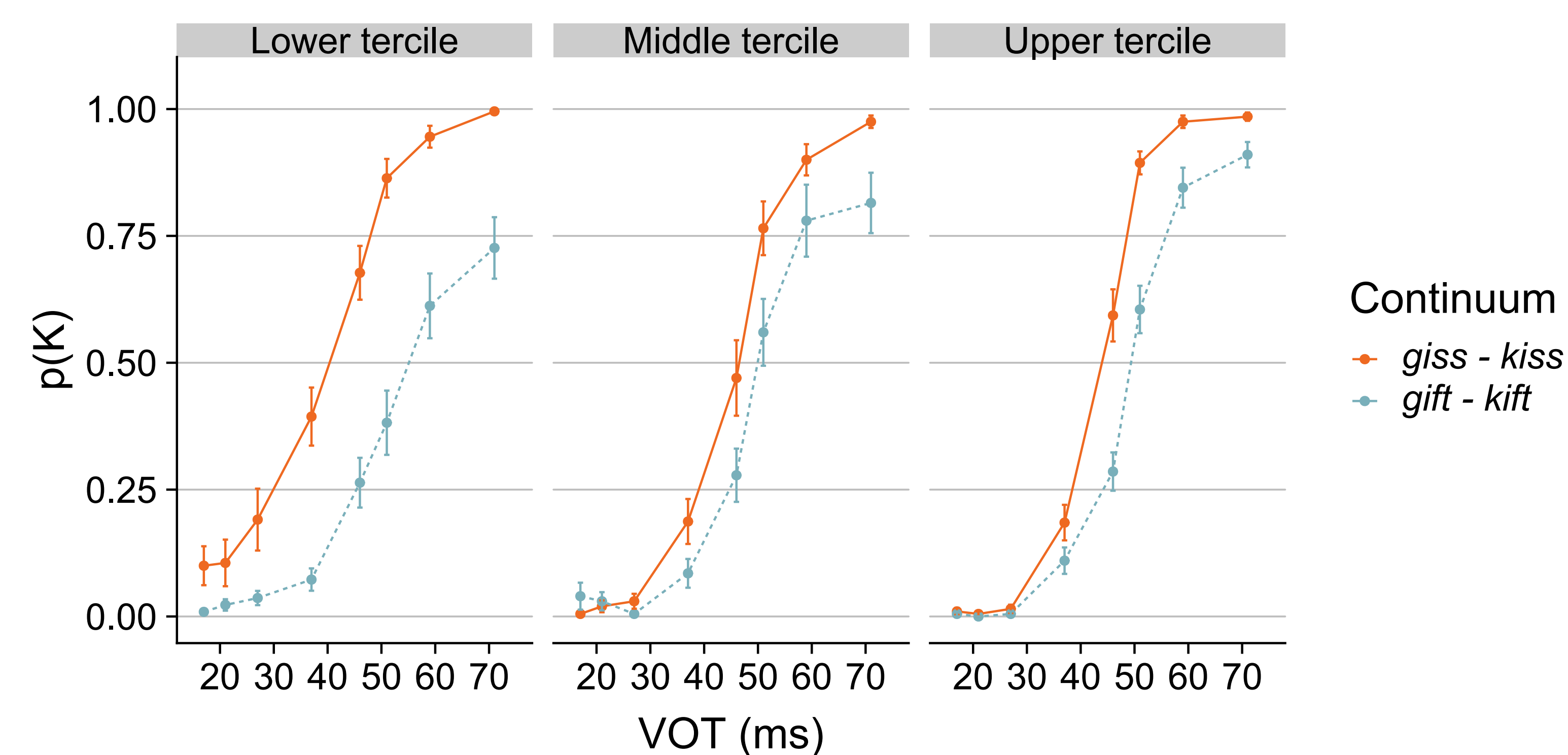
- Participants completed 2 blocks of lexical decision, each followed by a phonetic categorization test for tokens from a *sign-shine* continuum.
- Ambiguous stimuli replaced /s/ in block 1 (SS bias) and /ʃ/ in block 2 (SH bias).
- If lexically guided perceptual learning is occurring, then participants will perceive more *sign* tokens at test following the SS bias block compared to the SH bias block.



## Results



- Participants had a large range of language (CELF Core Language) and cognitive (TONI) abilities. Language ability and nonverbal IQ constructs were modestly correlated ( $r = 0.26$ ,  $p = 0.038$ ).
- The Ganong effect was mediated by CELF score; those with *lower* language skills show a *stronger* Ganong effect. There was no effect of nonverbal IQ on the Ganong effect.



- For the LGPL task, the main effect of bias (SS vs. SH) was mediated by time (first half vs. second half), and further by CELF score. In the first half of the test block, learning was *stronger* for those with lower CELF scores compared to those with higher CELF scores. The effect of bias was not reliable in the second half of the test block, consistent with previous research [7].

## Conclusions

- Weaker language abilities were associated with a larger Ganong effect, demonstrating increased reliance on the lexicon.**
- Weaker language abilities were associated with stronger learning effects, demonstrating intact learning mechanism.**
- Bootstrapping analyses showed that the current results are robust to variation in sample size, the specific participants included in the sample, and the specific measure of language ability.**
- In contrast to previous research [1], there was no evidence to suggest impaired lexically guided perceptual learning in those with weaker language abilities. This may reflect the specific construct used to measure language (vocabulary size vs. expressive/receptive language).**

## Acknowledgements/References

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### References

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