

Predictors of word and sign superiority effects for deaf readers

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Background

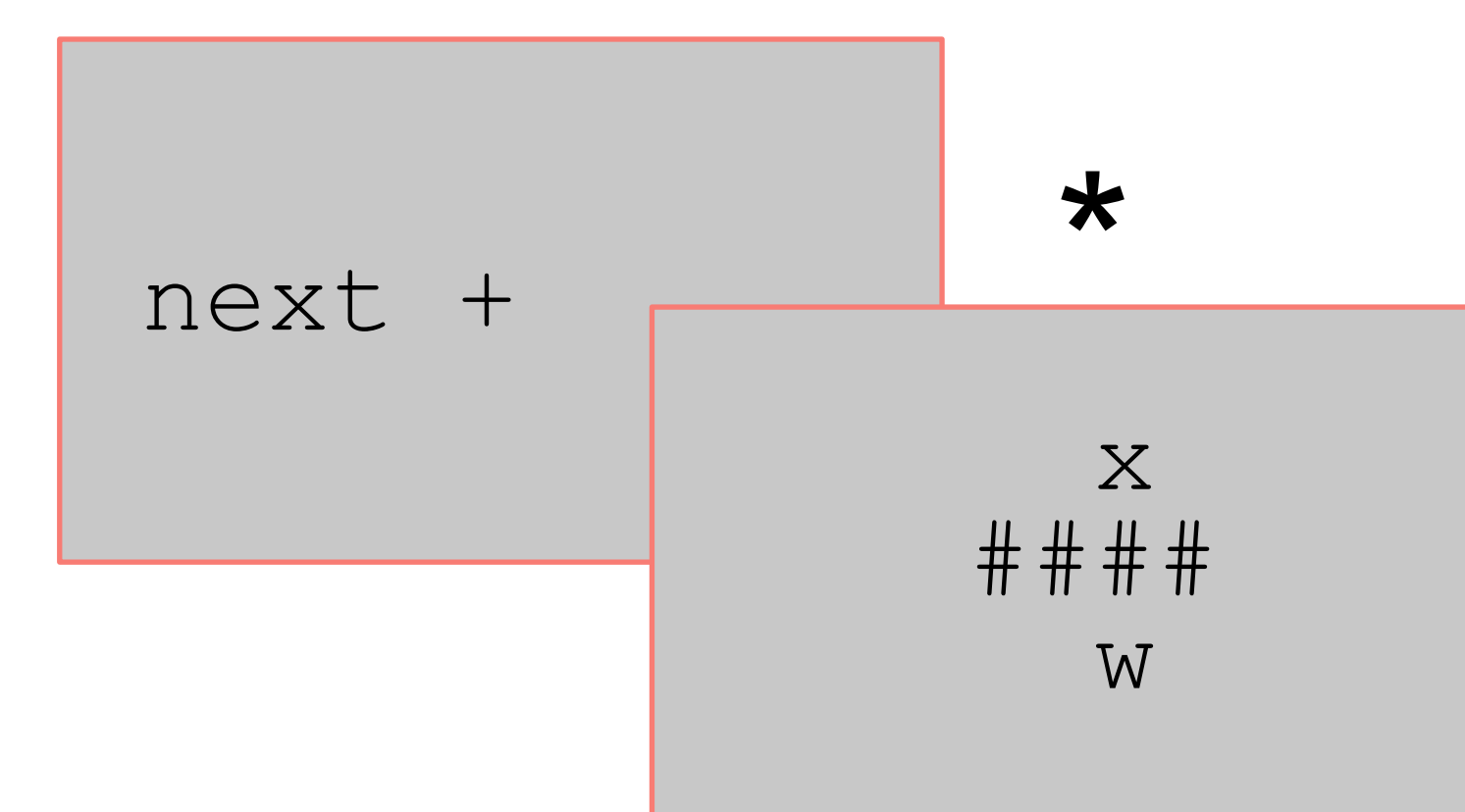
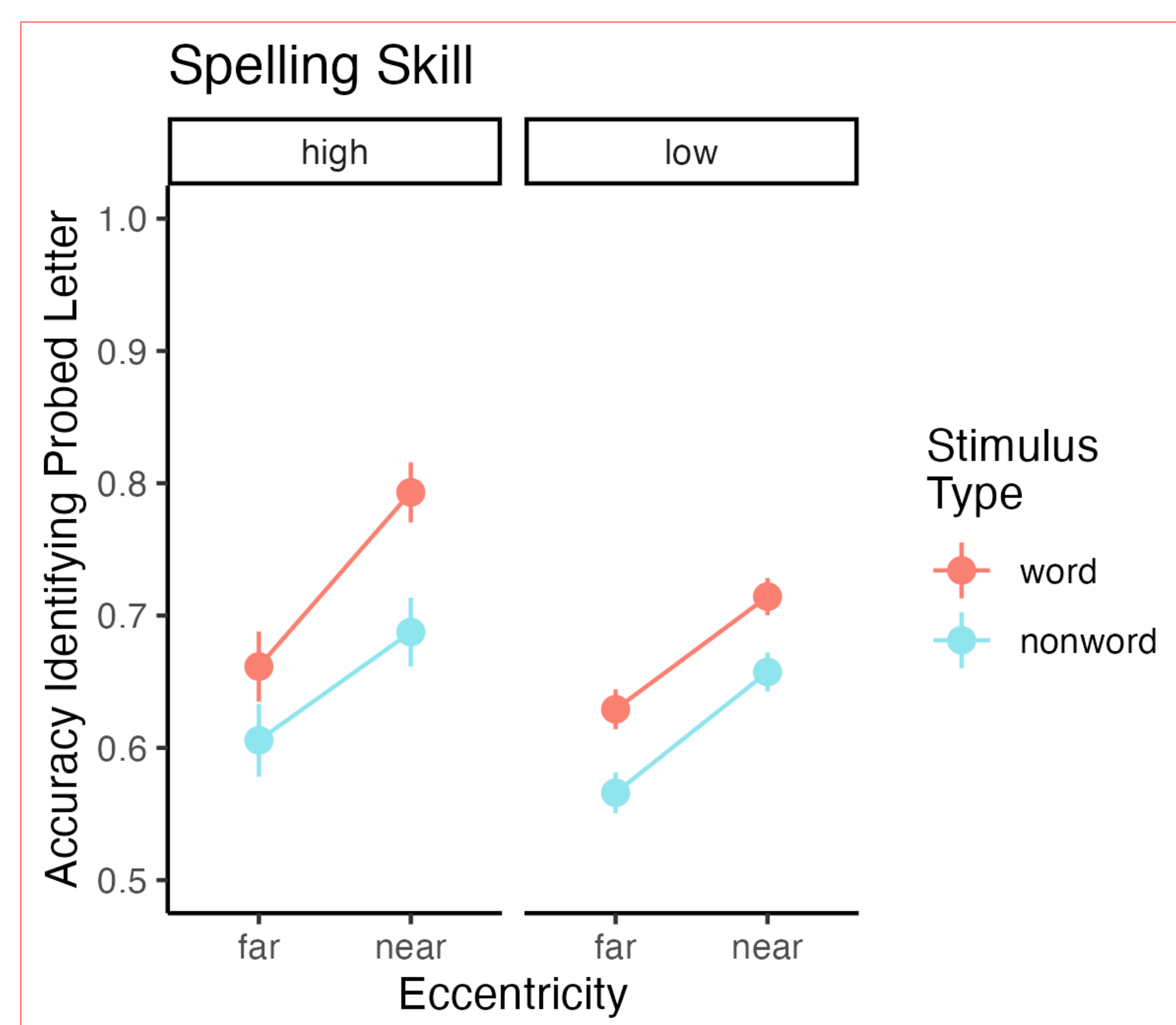
- **Lexical superiority effect:** sublexical components (i.e., letters, handshapes) are recognized **more accurately** in words/signs than pseudowords/signs^{4,5,6}
 - Reflective of top-down processing that prioritizes lexical items
- It is unknown whether language proficiency measures (i.e., reading or sign comprehension, spelling ability) can predict the magnitude of the lexical superiority effect

Methods

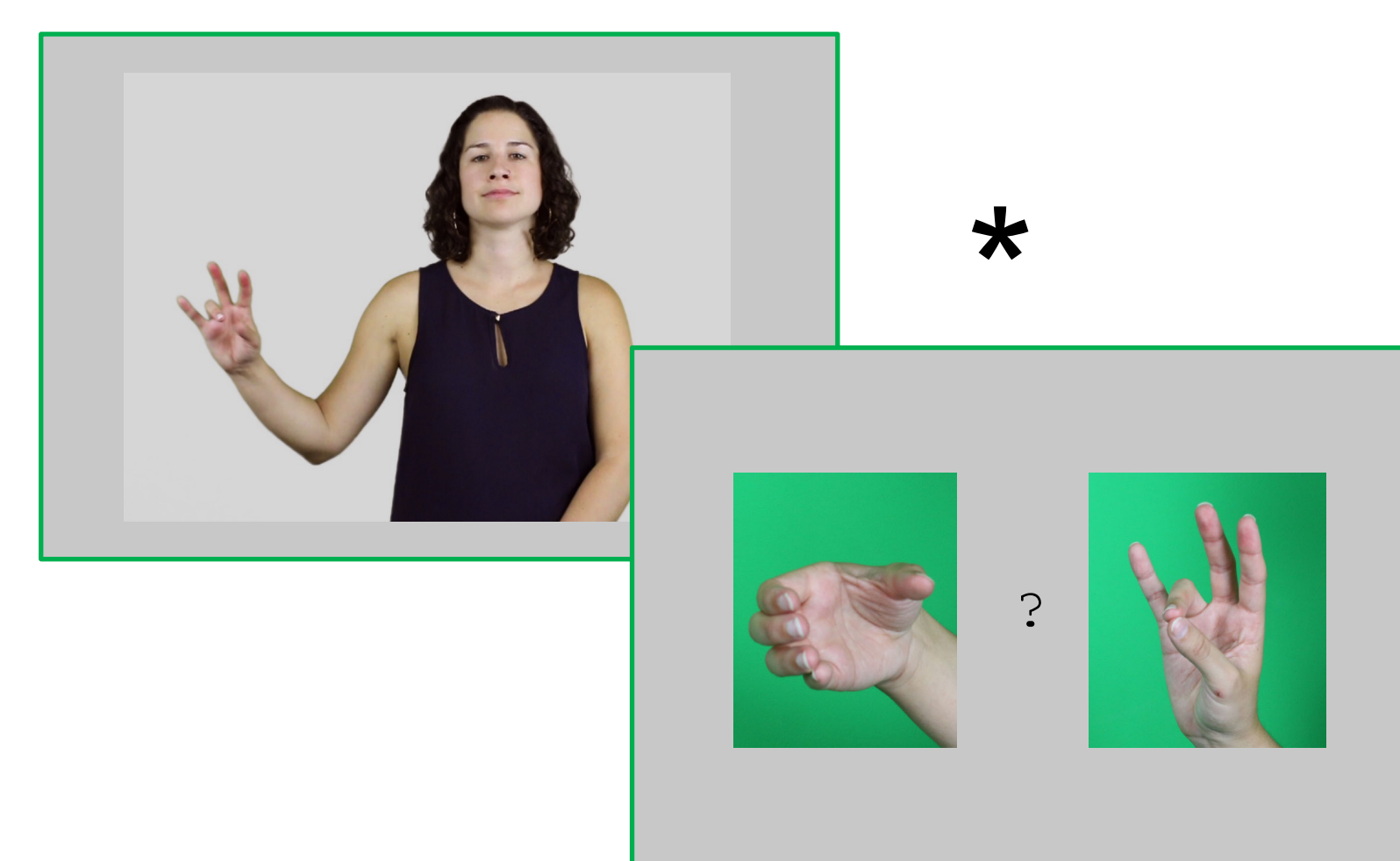
- **Participants**
 - Deaf American Sign Language (ASL)/English bilinguals
 - All learned ASL prior to age 7
- **Tasks**
 - **Word Superiority (WS):** Identify letters at a given position from rapidly presented 4-letter words/pseudowords; presented at near and far eccentricities
 - 36 participants; Mean age = 33.4
 - **Sign Superiority (SS):** Identify handshapes from signs and pseudosigns; presented at near and far eccentricities
 - 40 participants; Mean age = 32.5
- **Assessments**
 - **ASL skill:** ASL Comprehension Test²
 - **Reading skill:** Peabody Individual Achievement Test- Revised⁴, reading comprehension subtest
 - **Spelling skill:** Spelling Recognition Test¹
- **Apparatus:** EyeLink 1000+ or EyeLink Portable Duo in desktop configuration

Results

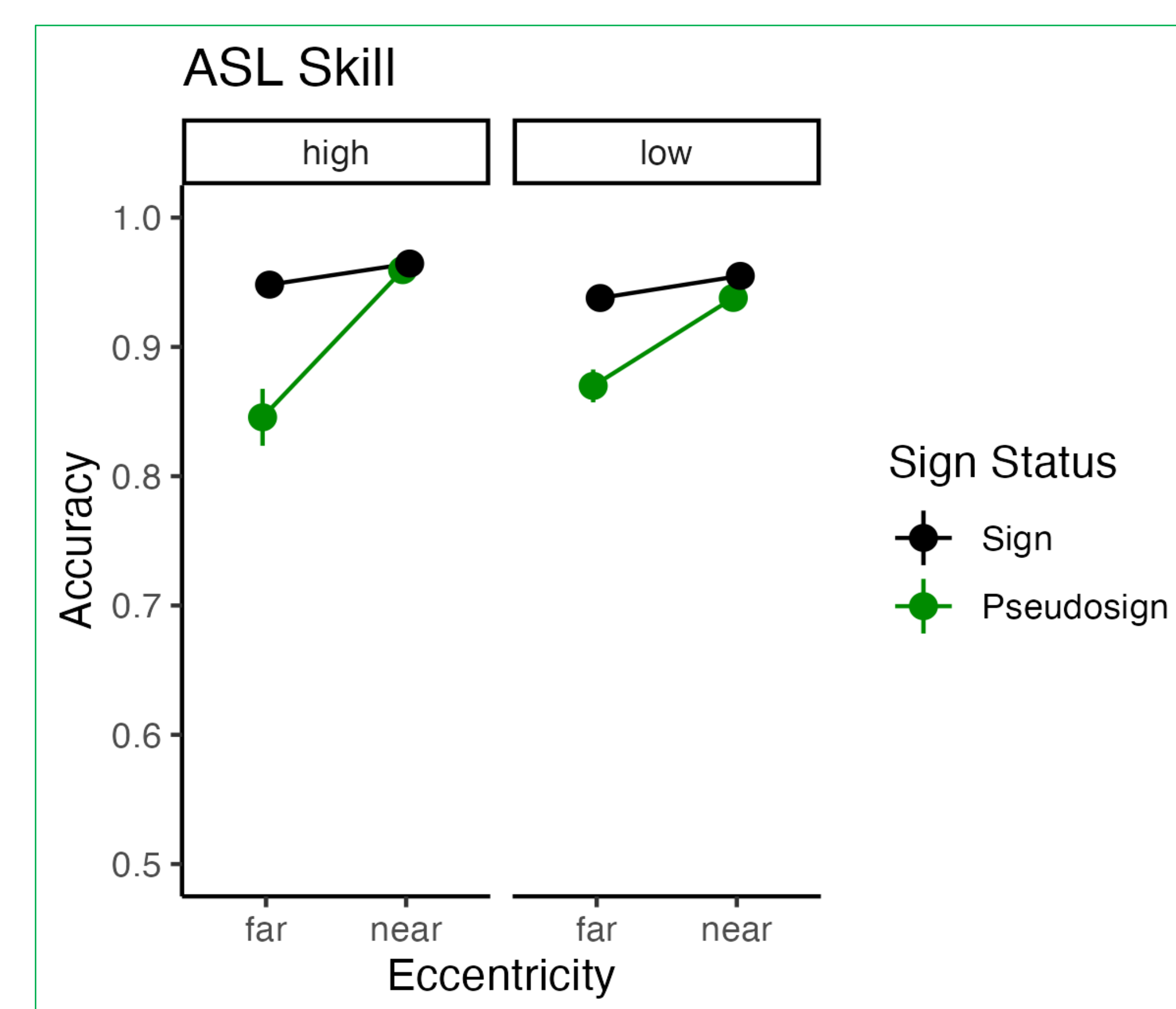
- Difference in accuracy between words/signs and pseudowords/signs (Lexicality) reflects the lexical superiority effect



- **No main effect of reading skill** ($p = 0.28$); **no interactions** with lexicality or eccentricity
- **Main effect of spelling skill** on overall accuracy ($p=0.02$)
 - Better spellers were more accurate identifying letters
- **Significant interaction** between spelling skill and lexicality ($p = 0.005$) but not eccentricity
 - **Lexical superiority effect was larger for better spellers**



- **No main effect of ASL skill** on overall accuracy ($p=0.68$)
- **No interactions** between ASL skill and either lexicality or eccentricity effects ($p = 0.96, 0.82$ respectively)



* examples not to scale

References

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Discussion

- **Spelling skill predicted size of word superiority (WS) effects**
 - Better spellers may have **stronger top-down connections** between lexical and sublexical information
- Reading skill **did not predict overall task accuracy or size of the WS effect**
- ASL skill **did not predict overall task accuracy or size of sign superiority (SS) effect**

Conclusions

- WS effects are **driven by awareness of English sublexical components** (i.e., spelling), rather than reading proficiency
- ASL proficiency also **does not predict magnitude of SS effect**
 - Some measure of ASL sublexical awareness (fingerspelling skill, phonological awareness, etc.) may predict SS effects
 - However, ASL phonology or fingerspelling \neq English spelling; no clear equivalent to spelling in a nonwritten language



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