Deaf middle school bilinguals activate ASL signs while reading English words

**Connected, but not confused:**
Deaf middle school students co-activate English print and American Sign Language in a monolingual semantic judgment task

### Background
- Bilingual lexical processing: Target language and non-target language simultaneously activated
- Deaf and hearing bilingual adults activate signs when reading printed words
- Question: When in development is cross-language activation observed in deaf signers?
- Approach: Investigate written word processing in bilingual (American Sign Language and English) deaf middle school students.

### What did we expect?
**Hypothesis 1:** Deaf bilingual middle schoolers *already have* connections between signs and print words
- ASL phonology will facilitate response times during monolingual English semantic judgment task

**Hypothesis 2:** Deaf bilingual middle schoolers *have not yet developed* connections between signs and print words
- No effect of ASL phonology on monolingual English semantic judgment task

### Our findings support Hypothesis 1:
- Evidence for existing connections between signs and printed words while language proficiency is still developing.
- Deaf bilingual middle school students show advantage in processing the semantics of written English words.
- Being bilingual in two languages, which differ in modality, does not cause confusion.

### Results & Discussion
- Cross-language activation: Deaf group showed facilitation effect ($p < 0.001$)
- No effect in hearing controls
- Deaf children responded significantly faster than hearing group ($p < 0.001$)
- Groups did not differ in accuracy scores ($p > 0.1$)

### Method
- Implicit priming paradigm by Morford et al. 2011 (adapted from Thierry & Wu, 2007)
- Monolingual English semantic judgment task
- Half of English word pairs had phonologically related translation equivalents in ASL
- Phonologically related translation equivalents shared at least two phonological parameters
- Experimental group: 39 deaf ASL-English bilingual children (age range = 11–15 years)
- Control group: 26 hearing English monolingual children (age range = 11–14 years)
- Analyses: Mixed effects linear regression, semantically related and unrelated conditions analyzed separately

### References
- Chu et al., 2014; Gibson et al., 2015; Kubo et al., 2015; Mende et al., 2017;
  Villmair et al., 2016

### What is the significance of this study?
This study provides evidence that deaf bilingual children activate both languages simultaneously during reading English words, with phonological similarities facilitating processing. This highlights the unique cognitive demands of being bilingual in two distinct languages, one of which is typically non-oral.

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