



Introduction

Phonological units in American Sign Language (ASL) include handshape, location, and movement.

Previous ERP priming studies have investigated how overlap in these phonological units affects the processing of target signs. Results across studies have revealed mixed phonological priming effects:

- Target signs with primes overlapping in both handshape AND location elicited smaller amplitude N400s than targets with phonologically unrelated primes [1].
- Target signs with primes overlapping in location elicited larger amplitude N400s than targets with phonologically unrelated primes [2].

Due to methodological differences between these studies, it is unclear whether the opposing direction of the priming effects is theoretically informative. This study aimed to compare the priming effects of overlap in different phonological units within one group of participants completing the same task.

We asked how phonological overlap influences priming when signs overlap in handshape only, location only, or both handshape and location.

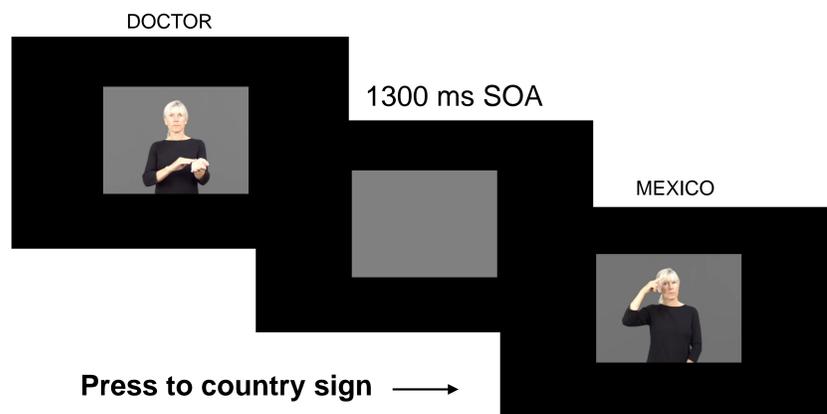
Methods

Participants

20 deaf signers of ASL ($M_{age} = 34.3$)
All participants learned ASL before the age of 7

Procedure

Go/no-go semantic categorization task:
“Press if you see a country sign” (e.g., MEXICO)
Country signs included in non-critical pairs, 14% of trials



Stimuli

46 targets in each condition: handshape only, location only, and handshape plus location
Same targets occurred in both the related and unrelated conditions
Sign videos clipped 2 frames before sign onset
ERPs time-locked to target video onset

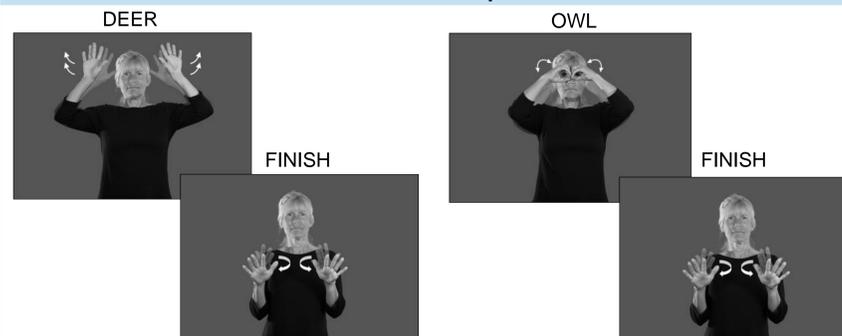
Related pairs

Unrelated pairs

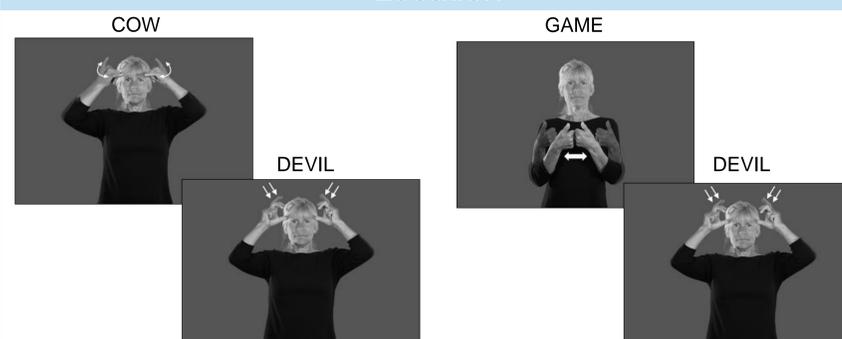
Handshape & Location



Handshape



Location

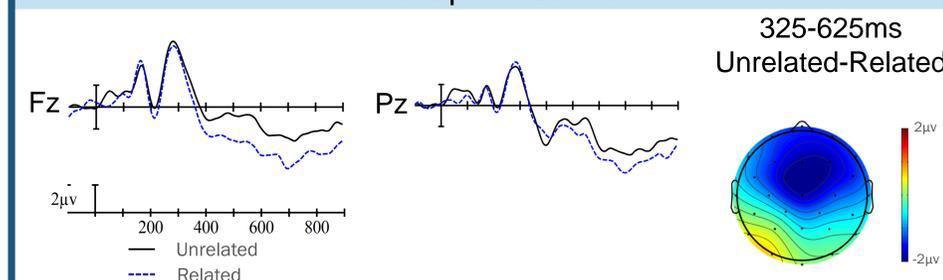


References

- [1] Meade, G., Lee, B., Midgley, K. J., Holcomb, P. J., & Emmorey, K. (2018). Phonological and semantic priming in American Sign Language: N300 and N400 effects. *Language, cognition and neuroscience*, 33(9), 1092-1106
- [2] Gutiérrez, E., Müller, O., Baus, C., & Carreiras, M. (2012). Electrophysiological evidence for phonological priming in Spanish Sign Language lexical access. *Neuropsychologia*, 50(7), 1335-1346.
- [3] Coch, D., Grossi, G., Coffey-Corina, S., Holcomb, P. J., & Neville, H. J. (2002). A developmental investigation of ERP auditory rhyming effects. *Developmental Science*, 5(4), 467-489.

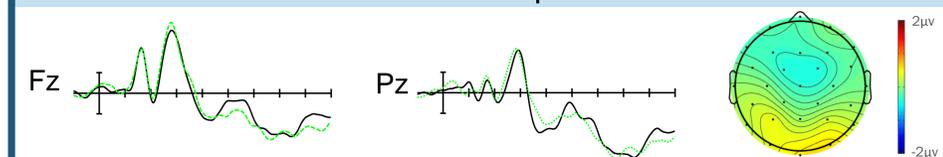
Results

Handshape & Location



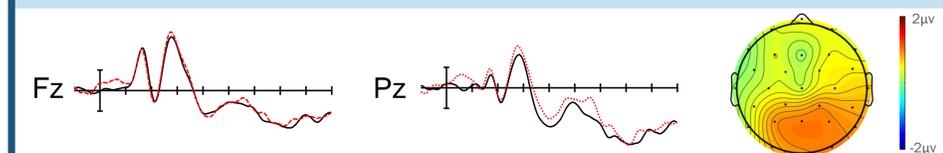
Targets with primes sharing both handshape AND location elicited a priming effect: smaller amplitude N400s relative to targets with unrelated primes.

Handshape



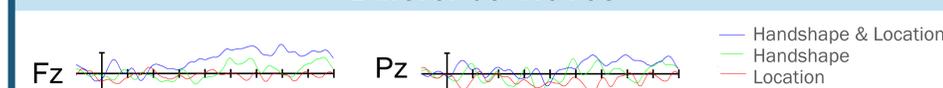
Targets with primes sharing only handshape elicited a weak priming effect: smaller amplitude N400s relative to targets with unrelated primes.

Location



Targets with primes sharing only location elicited a weak interference effect: larger amplitude N400s relative to targets with unrelated primes.

Difference Waves



Shared handshape AND location resulted in phonological priming.
Shared handshape patterned in the direction of priming.
Shared location patterned in the direction of inhibition.

Conclusions

- With the same participants and task, shared handshape and shared location elicit phonological priming effects in opposite directions.
- These effects are not additive; signs that shared both handshape AND location elicited even stronger priming effects.
- The priming effect of shared handshape AND location may parallel rhyme priming in spoken languages [3].
- Location overlap may inhibit sign processing because of competition from phonological neighbors produced in the same location.