

Background

- Previous studies have shown that target signs elicit smaller amplitude N400s following phonologically related primes that share two parameters compared to unrelated primes [1]. A smaller N400 is suggestive of facilitated lexico-semantic processing.
- In contrast, target signs following phonologically related primes that only share location elicit larger amplitude N400s [2]. This larger N400 has been interpreted to reflect lexical competition between the prime and target.
- However, these studies differed not only in terms of the type of phonological manipulation (i.e., two-parameter overlap vs. location-only overlap), but also in terms of language (ASL vs. LSE), task (semantic relatedness vs. lexical decision), and other critical variables. Thus, it is difficult to draw meaningful conclusions.

Objectives

1. Verify the dissociation between two-parameter overlap and location-only overlap within the same group of participants using the same language and task.
2. Compare the size of phonological priming effects across tasks that differed in their lexical processing demands.

Introduction

Methods

Participants

- 20 Deaf signers ($M_{age} = 33$) (4 native; 16 early-exposed)

Tasks

- Experiment 1: Semantic Task (Press to country signs)
- Experiment 2: Form-Level Task (Press to repeated signs)

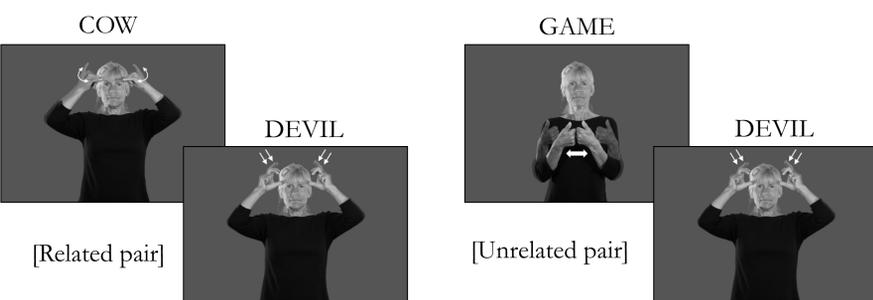
Stimuli

- 46 prime-target pairs in each overlap condition.
- Same targets occurred in both the related and unrelated conditions.
- 1300 ms stimulus onset asynchrony (SOA).
- ERPs time-locked to target video onset (videos clipped 2 frames before sign onset).

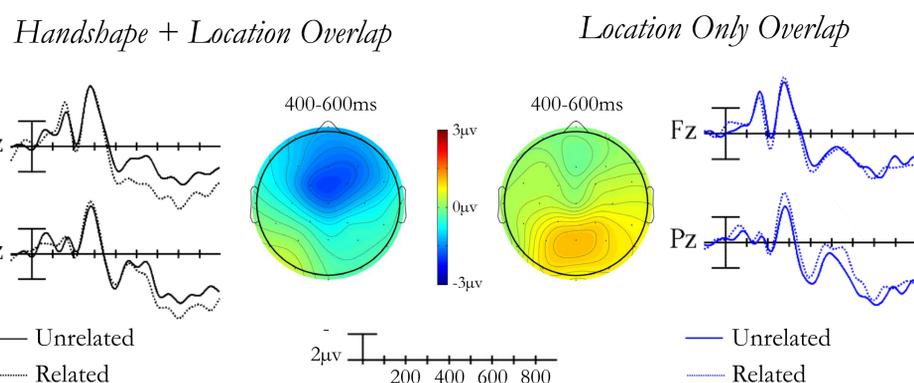
Handshape + Location Overlap



Location Only Overlap

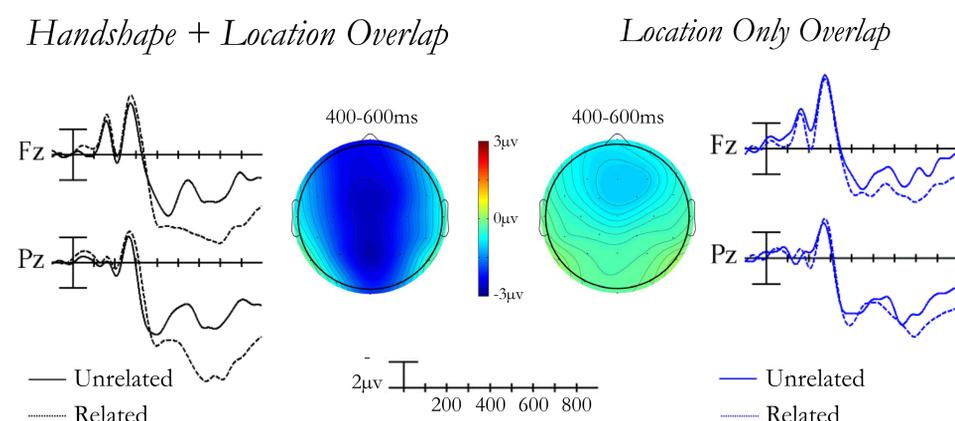


Semantic Task Results



- Two-parameter overlap elicited smaller amplitude N400s than the unrelated condition (indicating facilitation).
- Location overlap appeared to elicit larger amplitude N400s (indicating some interference), but this effect was not significant.

Form-Level Task Results



- Two-parameter overlap was again significant (and larger).
- The location overlap effect flipped directions; however, similar to the semantic task results, the effect was not significant.
- Consistent with the flip of the location priming effect, the interaction of priming and task was significant.

Conclusions

- The reversed location-only N400 priming effect and the diminished two-parameter N400 priming effect seen in the semantic task relative to the form-level task suggest an increase in lexical competition among neighbors due to the task requiring lexical access.
- Since the form-level task does not require lexical access, the N400 priming effects for both the location-only and two-parameter comparisons suggest that the shared sublexical parameters in the related conditions facilitate processing.
- Taken together, these results reinforce a distinction between sublexical and lexical levels of representation. They also suggest that the effects of phonological overlap at each level can be modulated by task demands.

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, 1092-1106. doi: 10.1080/23273798.2018.1446543
- [2] Gutiérrez, E., Müller, O., Baus, C., & Carreiras, M. (2012). Electrophysiological evidence for phonological priming in Spanish Sign Language lexical access. *Neuropsychologia*, 50, 1335-1346. doi: 10.1016/j.neuropsychologia.2012.02.018