

Introduction

Phonological priming in spoken language is defined as an attenuated amplitude N400 for phonologically related vs. unrelated words.¹

In sign language, phonologically related signs share handshape, location, and/or movement.

A study of phonological priming in Spanish Sign Language found the opposite effect typically found in spoken language, with a larger amplitude N400 for signs that shared location vs. phonologically unrelated signs.²

We used ERPs to investigate how phonological priming affects recognition of American Sign Language (ASL) target signs when they overlap by two phonological units with their primes.

We also compared the time course and distribution of this phonological effect to that of semantic priming in ASL.³

Methods

Participants

20 deaf ASL signers (10F, mean age = 29 years) who learned ASL from birth (n=13) or before the age of 7 (n=7)

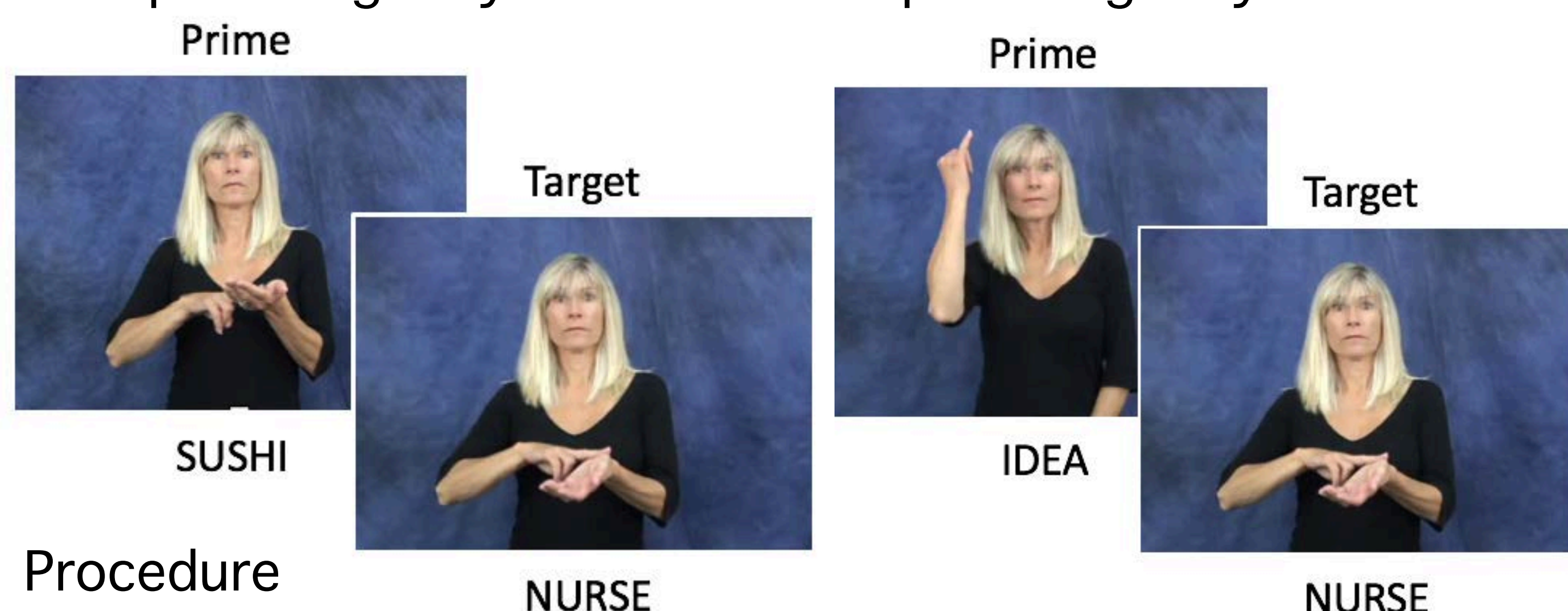
Stimuli

180 videos of ASL sign pairs

- 90 semantically related
- 90 semantically unrelated

45 phonologically related

45 phonologically unrelated



Procedure

SOA: 1300ms

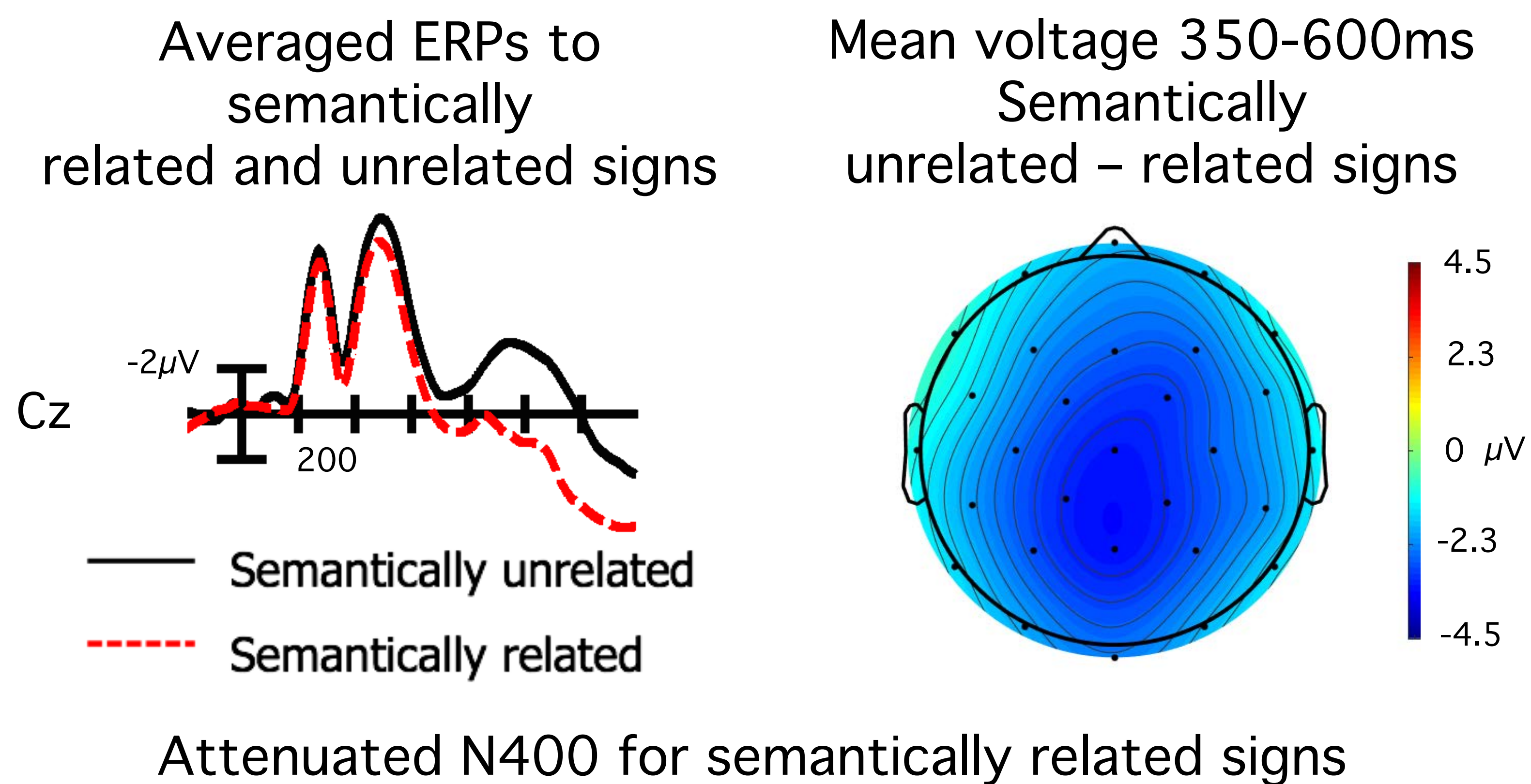
Semantic relatedness judgment task:

Participants informed of phonological manipulation but asked to focus on whether signs were related in meaning or not

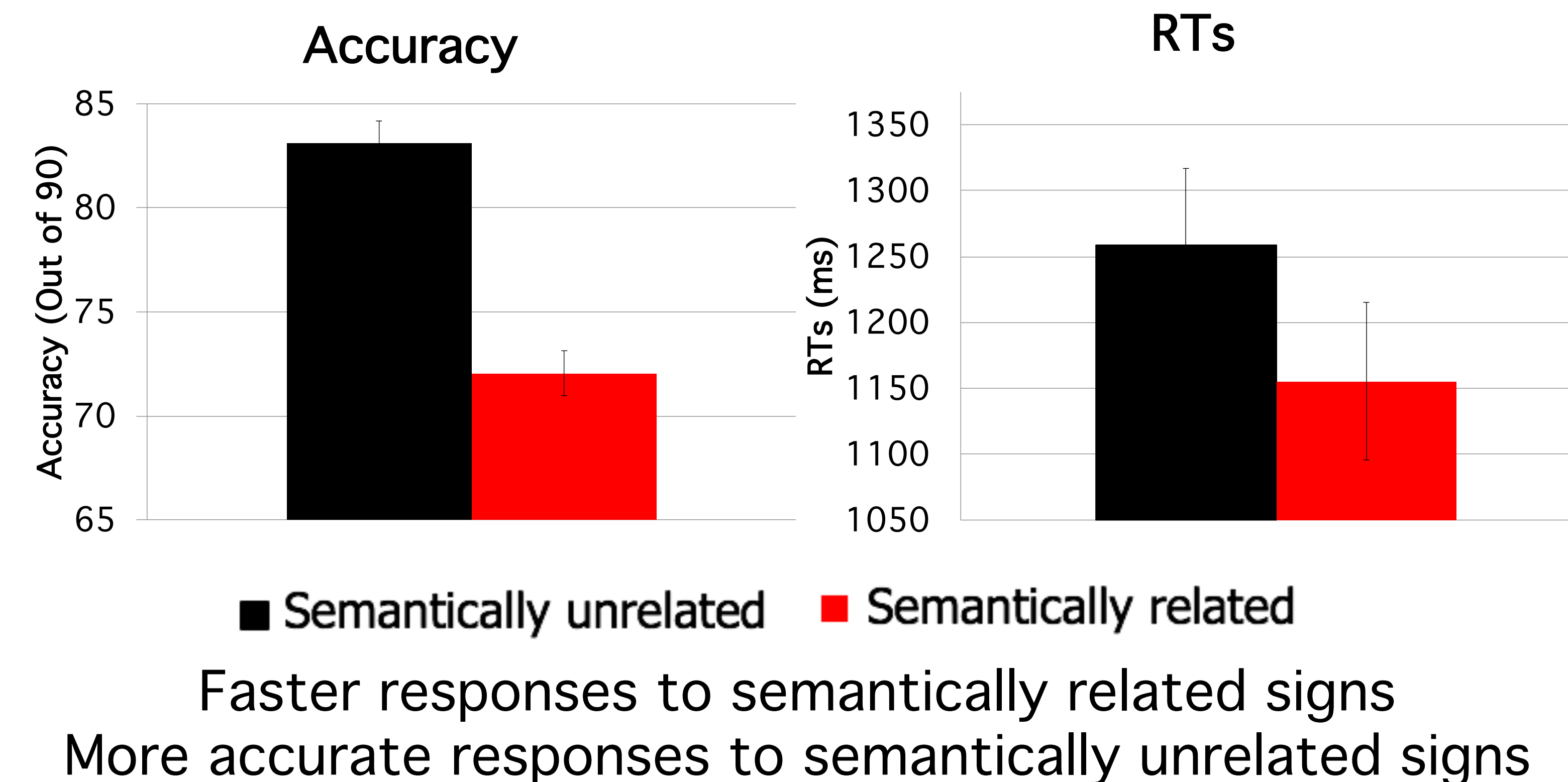
Videos clipped 2 frames before sign onset

ERPs time-locked to target clip onset

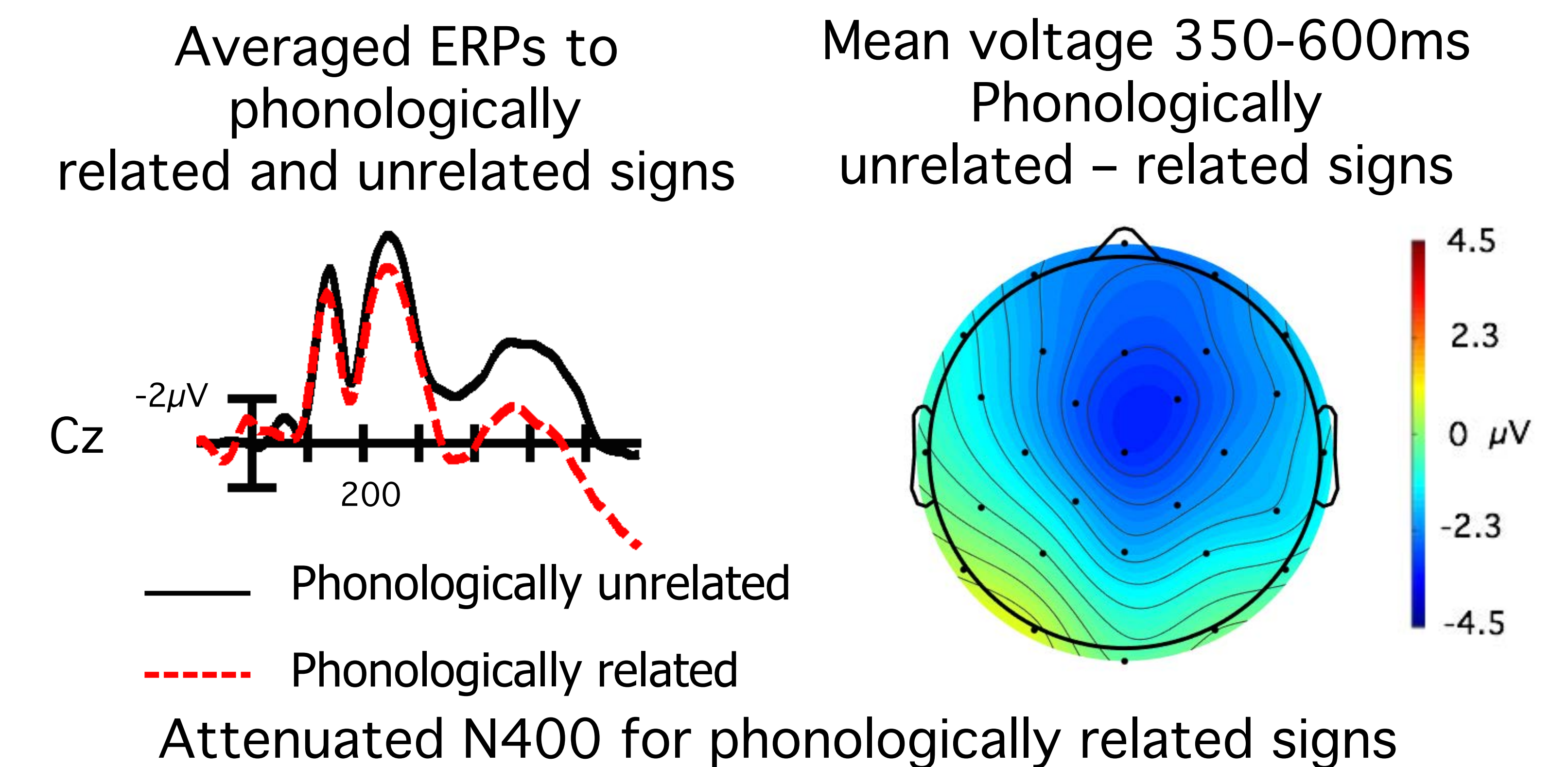
Results: Semantic



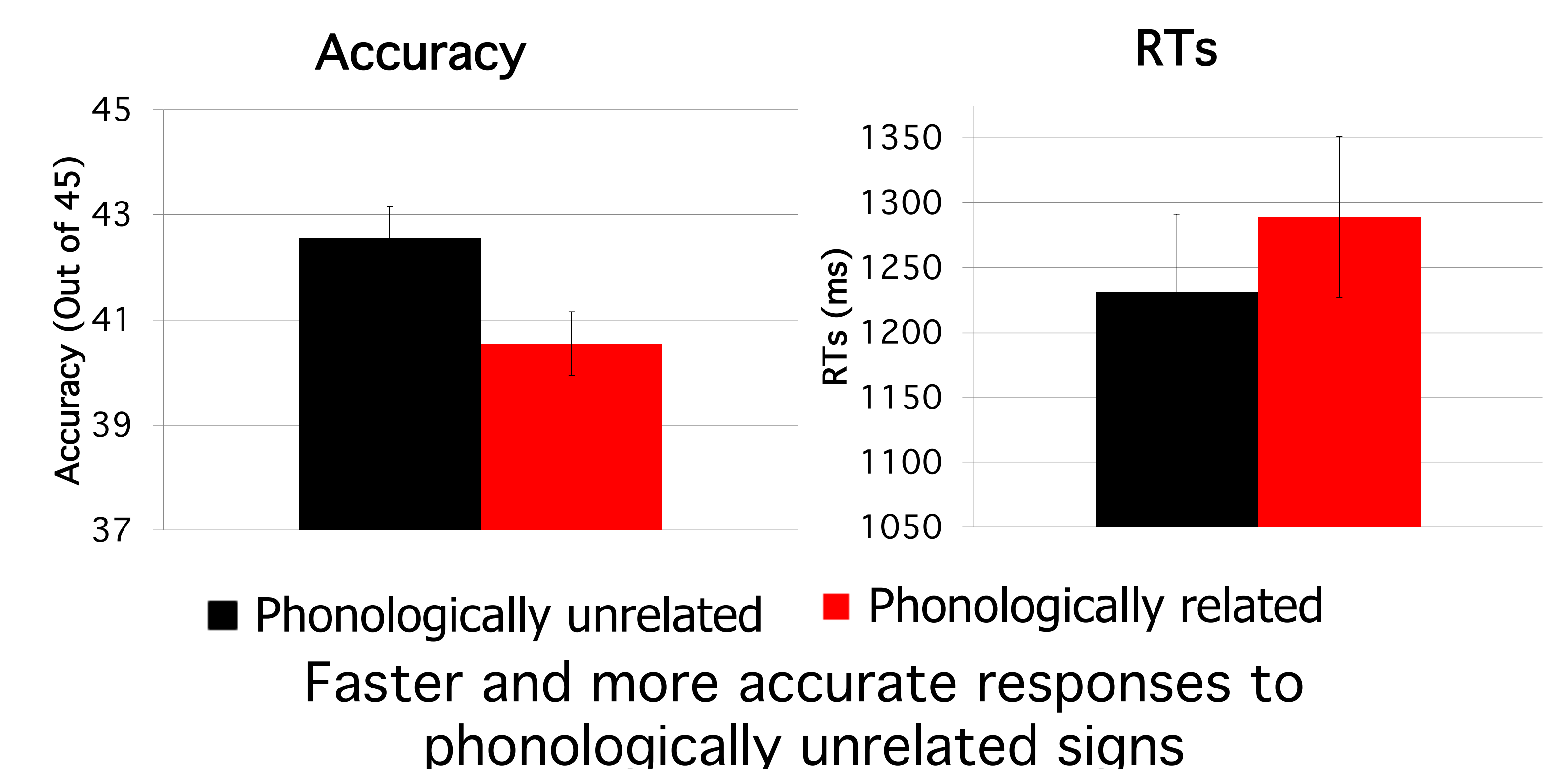
Behavioral Results



Results: Phonological



Behavioral Results



References

- 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.
- 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.
- Kutas, M., Neville, H.J., & Holcomb, P.J. (1987). A preliminary comparison of the N400 response to semantic anomalies during reading, listening, and signing. *Electroencephalography and Clinical Neurophysiology, Supplement* 39, 325-330.

Conclusions

Similar to phonological priming in spoken language, we found a smaller amplitude N400 for phonologically related signs vs. unrelated signs.

This finding is counter to another study of phonological priming in sign language². This discrepancy is likely due to the different degrees of phonological overlap.

Behavioral and ERP results replicated semantic priming effects previously found in signed and spoken languages, with faster RTs and a smaller amplitude N400 for semantically related vs. unrelated signs.

Although there was a similar time course for phonological and semantic priming in ASL, differences in distribution (more right anterior for the phonological effect) were indicative of distinct processes.