

# The neurocognitive correlates of talker-specific adaptation to Spanish-accented speech

Holly A. Zaharchuk<sup>1, 2</sup>, Janet G. van Hell<sup>1</sup>

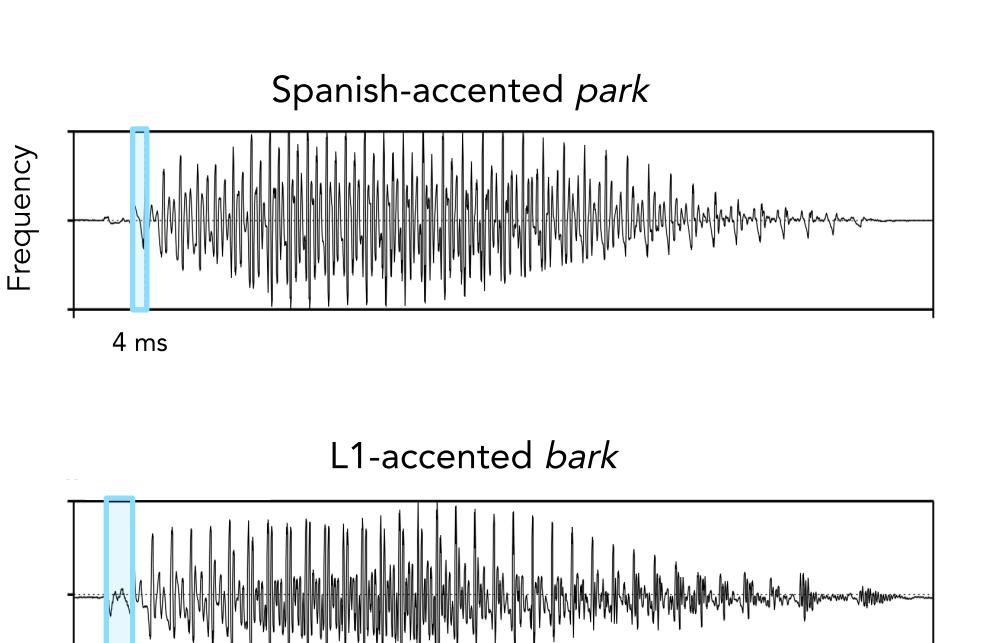
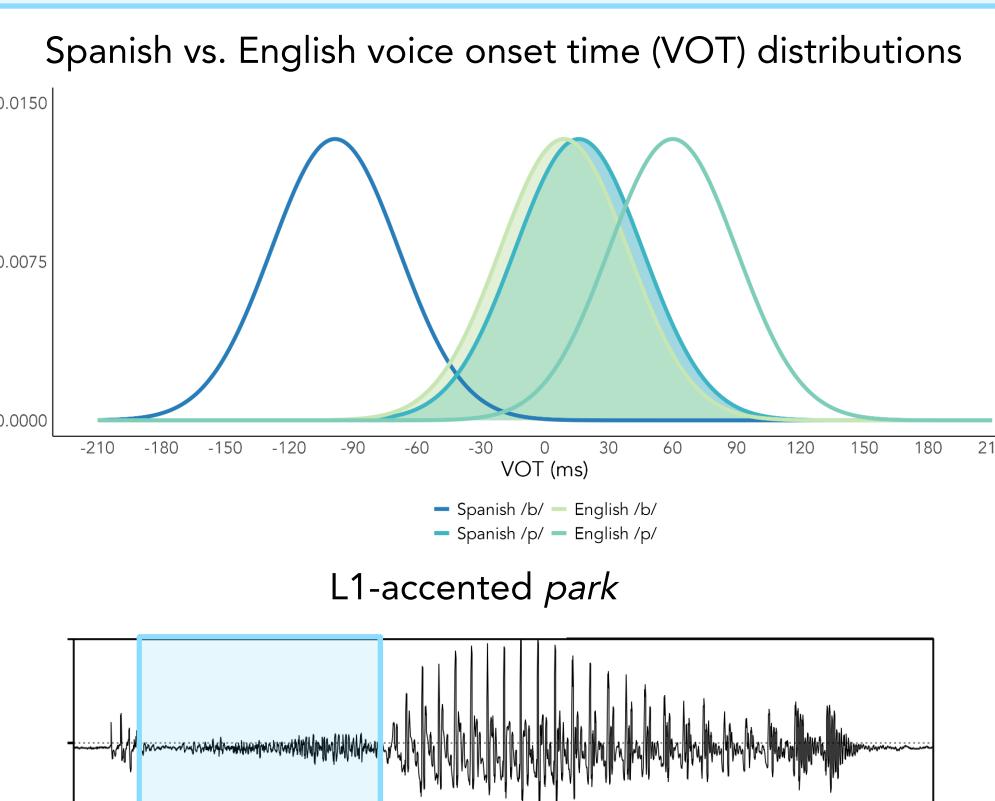


<sup>1</sup> Department of Psychology & Center for Language Science, The Pennsylvania State University

<sup>2</sup> Department of Speech, Language, and Hearing Sciences, University of Connecticut

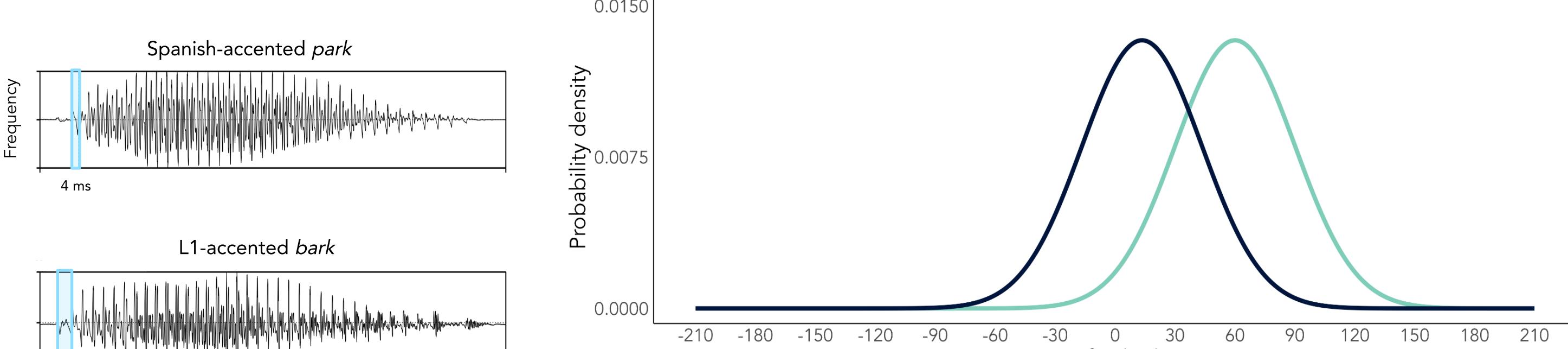
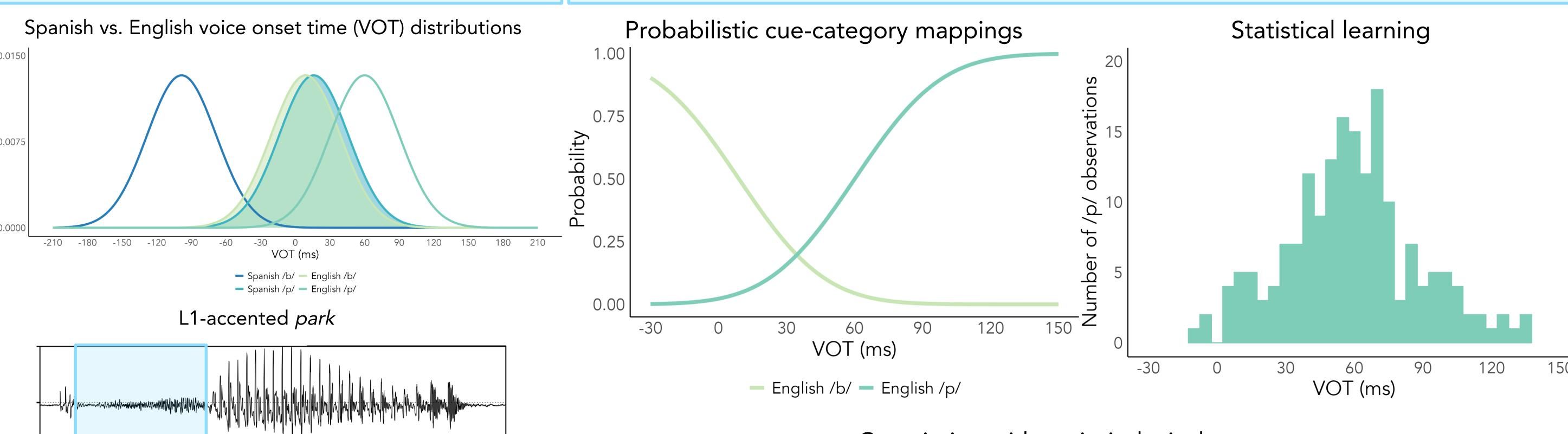
## Background

L2 speech production is influenced by L1 phonetic categories



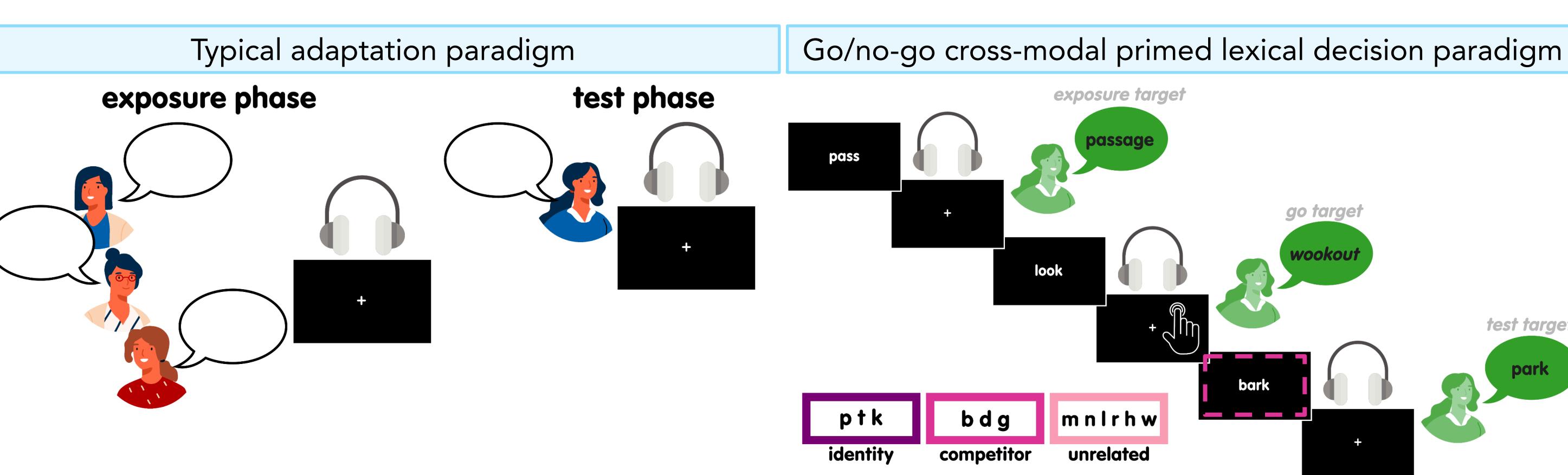
Chodroff et al. (2019); Flege and Bohn (2022); Nagle and Baese-Berk (2022)

High-level accent adaptation is grounded in low-level acoustic-phonetic processes



Kleinenschmidt (2019); Kleinschmidt and Jaeger (2015)

## Methods



## Stimuli

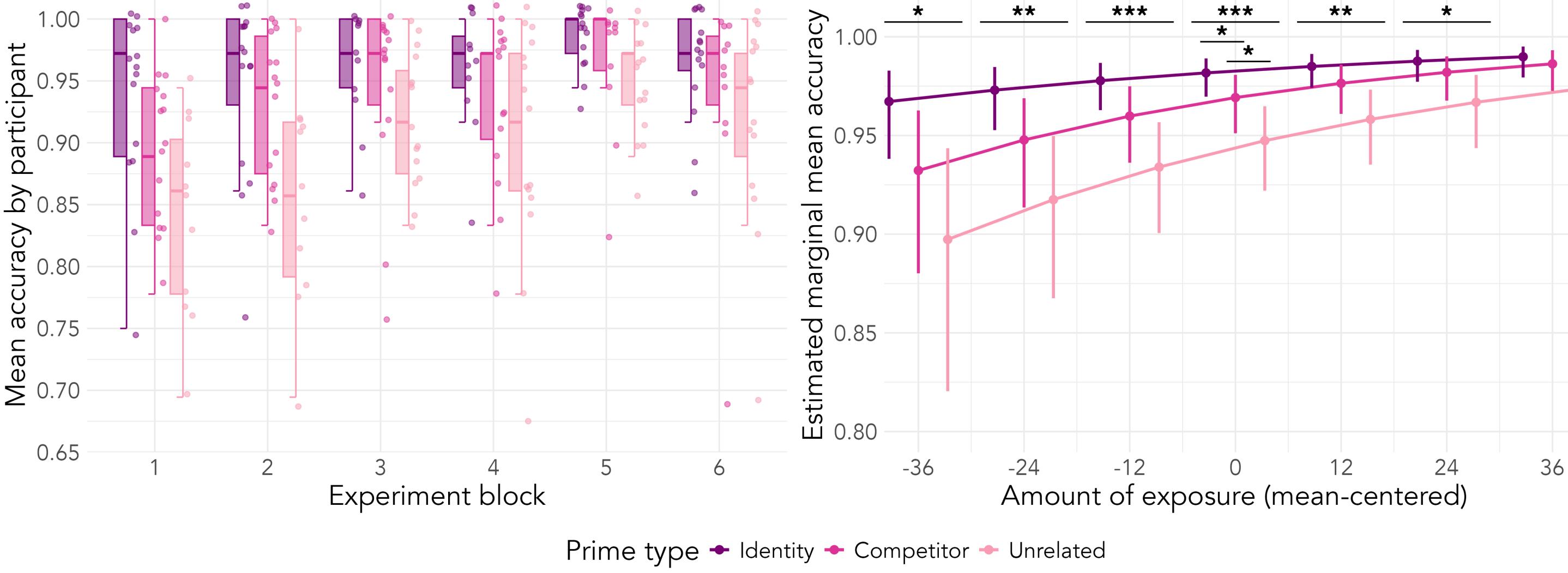
Trial type	Target onset	Target type	Target properties	Prime type	Number of trials	Prime-target examples
No-go	/p/, /t/, or /k/	Exposure	Multisyllabic real word	Match (first syllable)	72	pass-passage
		Test	Monosyllabic real word	Identity, Competitor, or Unrelated	216 (72 items x 3 prime types)	park-park wand-park
	/m/, /n/, /l/, /s/, /r/, or /w/	Filler	Multisyllabic real word	Majority match (first syllable)	144	rue-rhubarb
Go		Response	Multisyllabic pseudoword	Majority match (base word first syllable)	144	look-wookout

Overall prediction: Identity <> Competitor = Unrelated → Identity = Competitor <> Unrelated

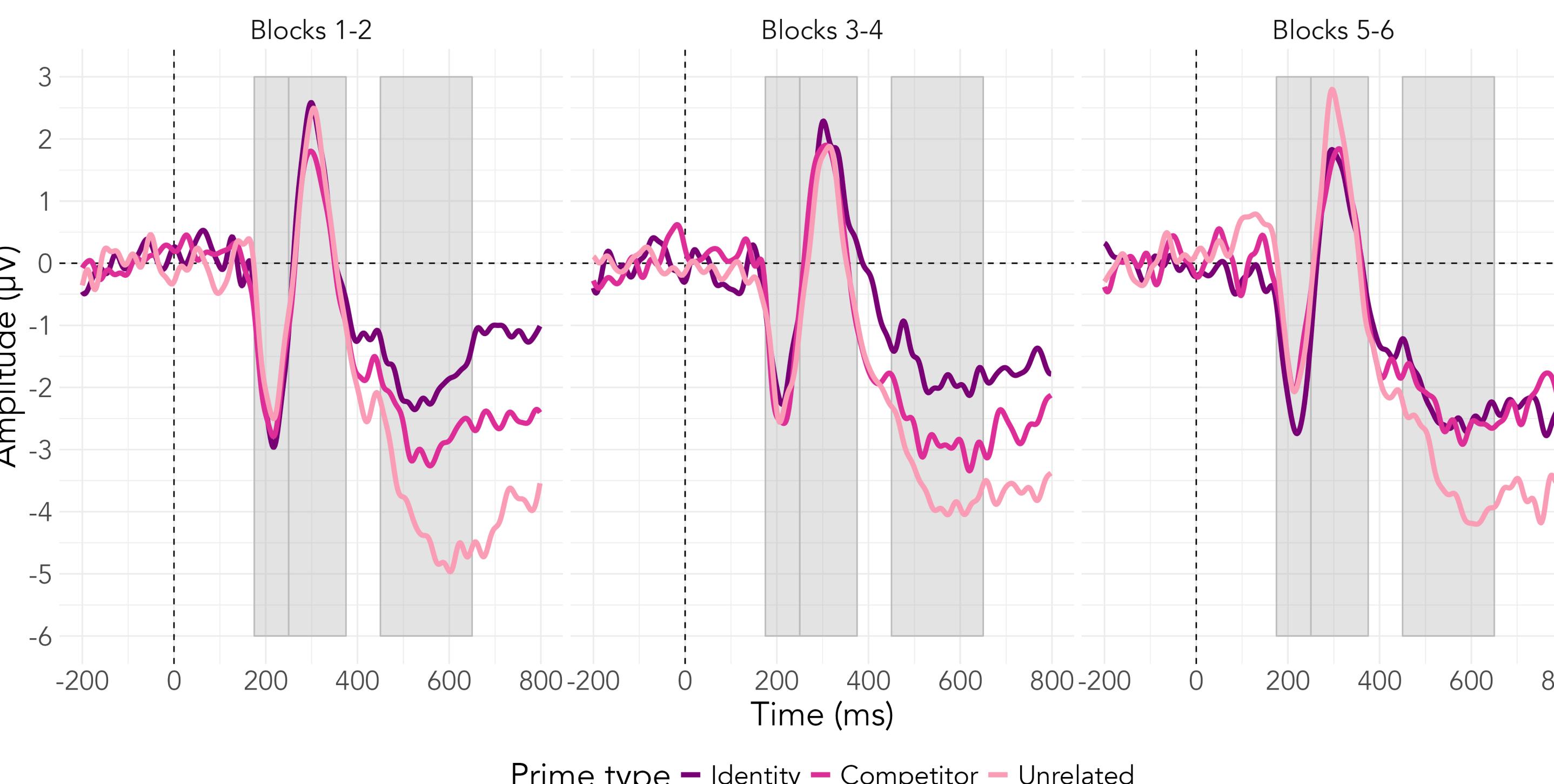
Component	Typical peak (ms)	General linguistic process	Specific correlates	Time window (ms)
N1	100	Acoustic	Gradience in speech perception; engagement of selective attention	175-250
P2	200	Phonetic	Perceptual learning performance	250-375
N200/PMN	200	Phonetic/phonological	Accented speech normalization	250-375
N400	400	Lexical/semantic	Lexical access during accented speech processing	450-650

## Key results

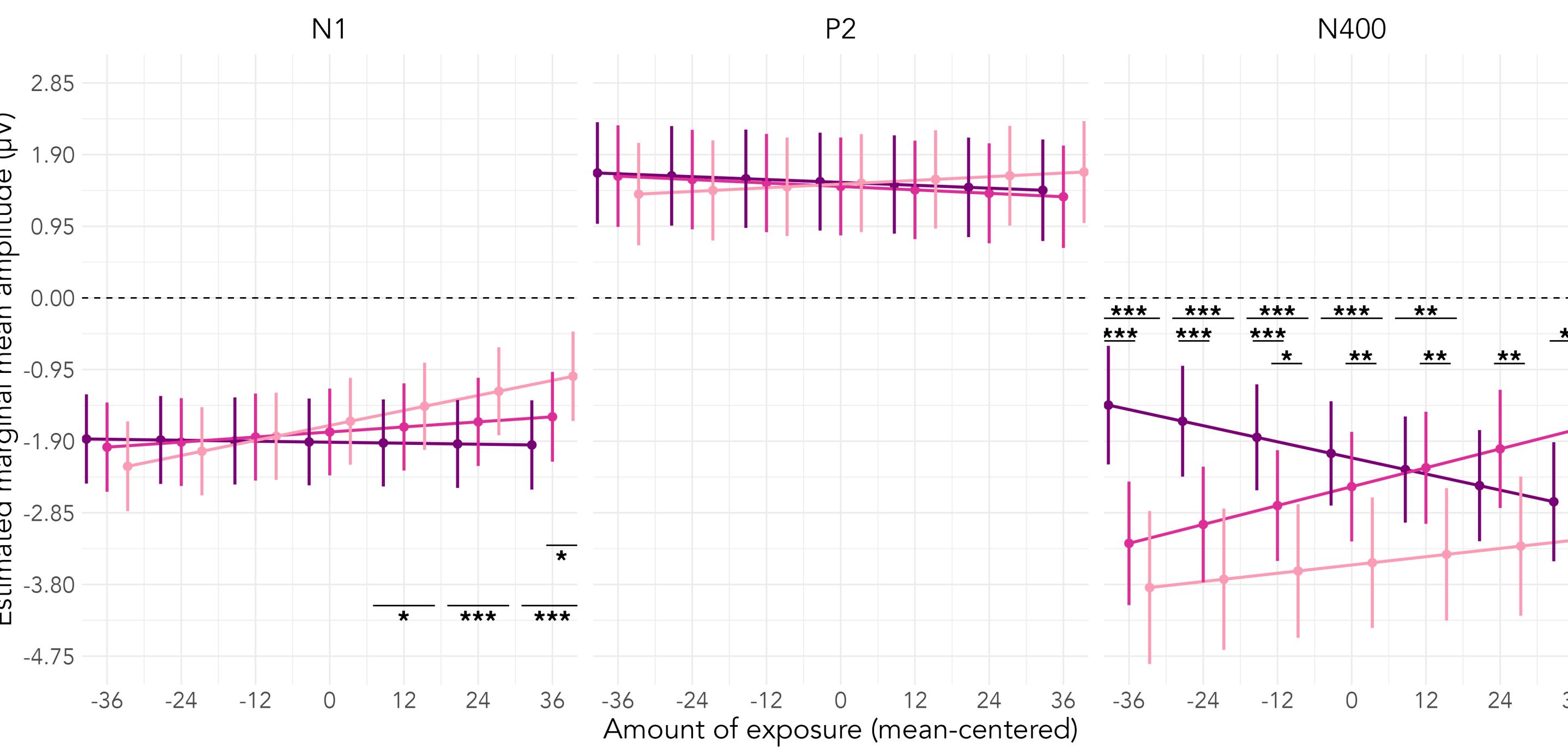
### Target accuracy by prime type



### Grand mean ERPs by prime type



### ERP responses by prime type

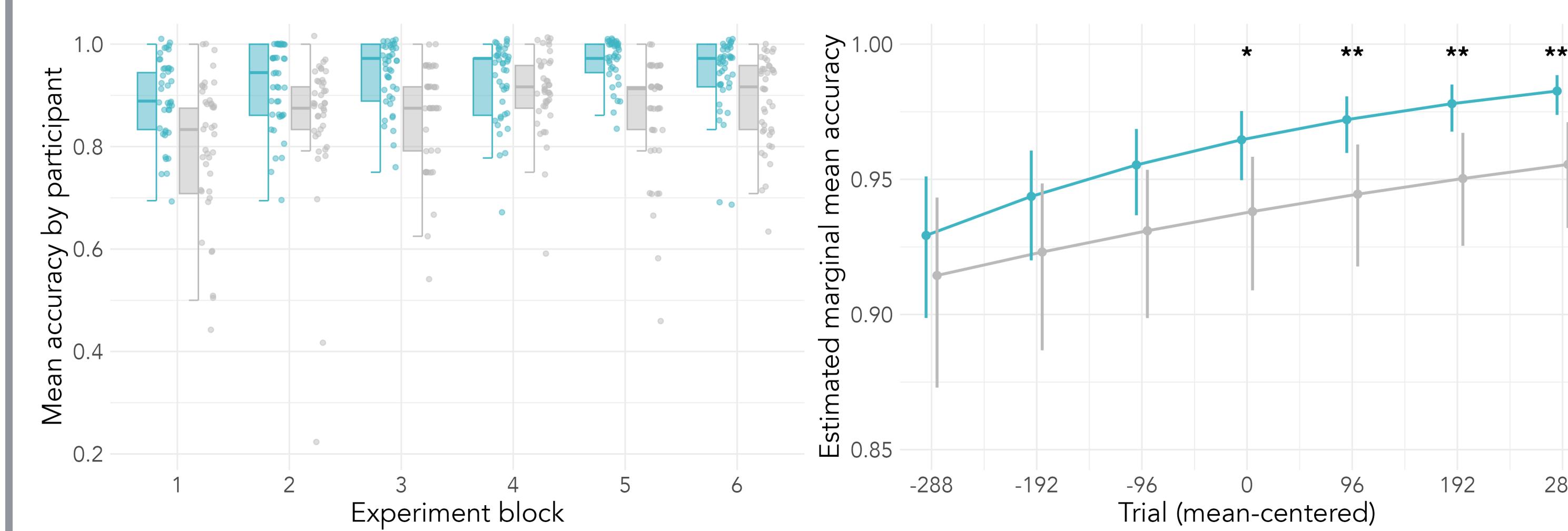


## Key take-aways

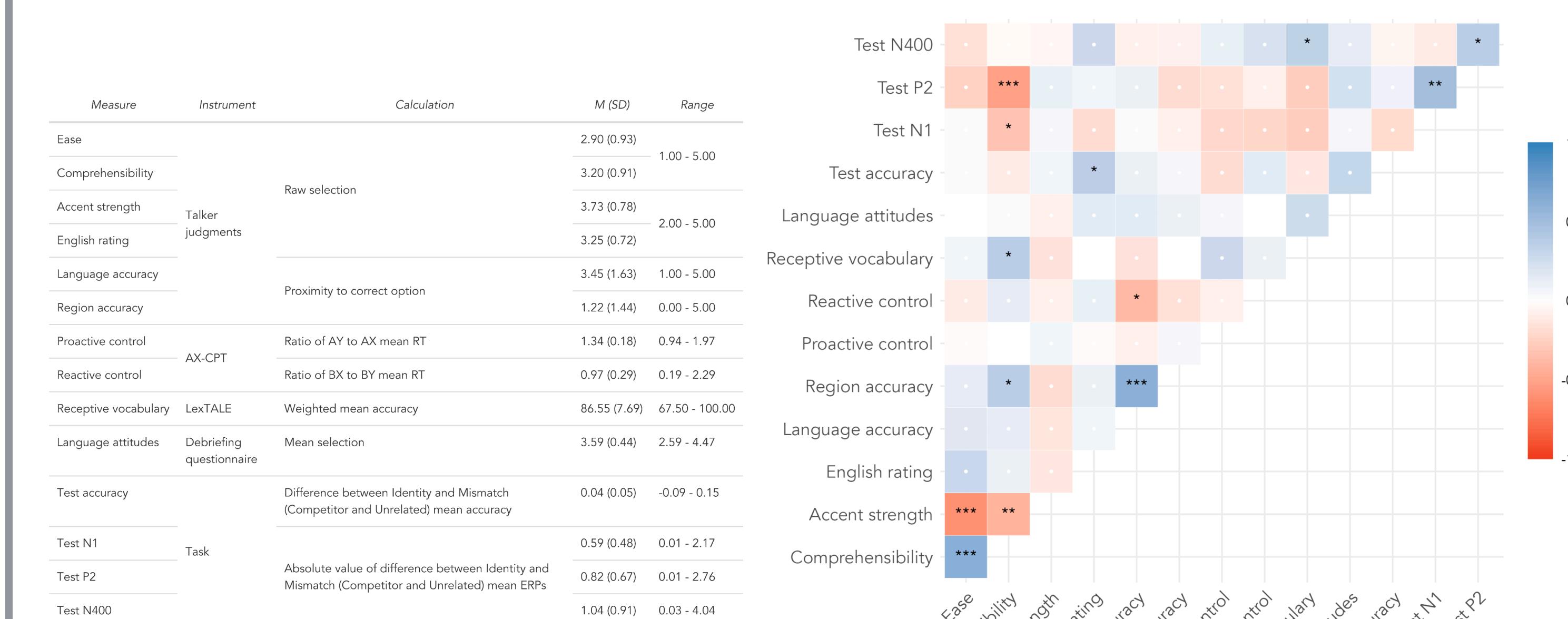
- Differential sensitivity to prime type emerged on the N1 as differences in priming decreased on the N400
- N1 modulation may reflect a shift in selective attention toward acoustic information (Joos et al., 2014)
- Accent adaptation may involve a shift from top-down to bottom-up word recognition mechanisms

## Additional results

### Target accuracy comparison



## Correlation analysis



## Additional methods

- Participants: 41 Penn State undergraduates, graduate students, and community members
  - Mean age of 20 (18-35)
  - One excluded from ERP analyses (head injury)
  - All grew up speaking English at home
    - Four identified as bilingual (self-rated proficiency less than 3/5)
    - Four grew up in multilingual households
    - Three indicated a dialect background other than American English (British, Canadian, Caribbean)
- Talker: Spanish-English bilingual from Mexico City, Mexico; age 31 at time of recording; moved to US at age 28; began acquiring English in school (age 5)

## References

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