

# Electrophysiological Indices of Emotional Faces on Time Perception

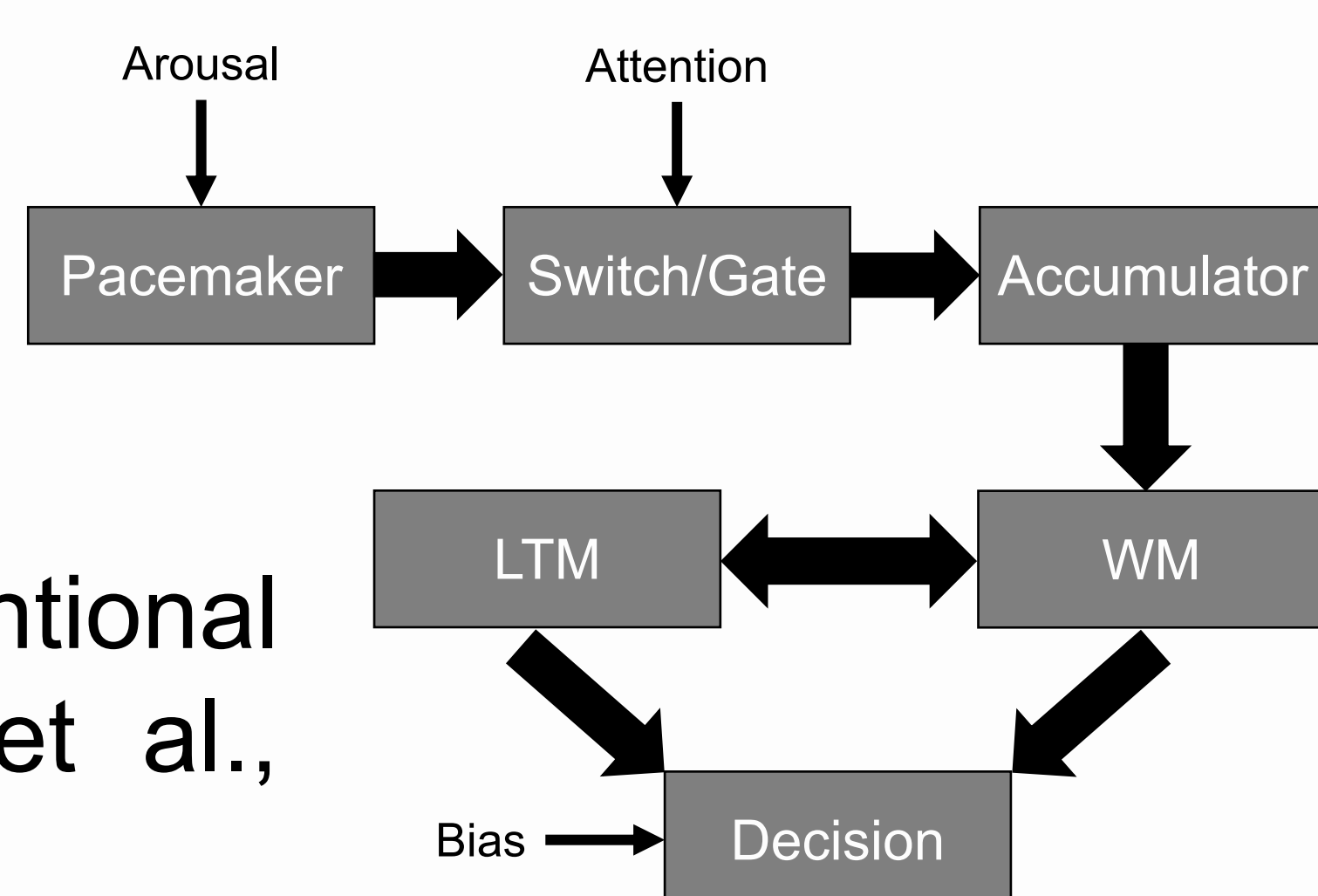
## Introduction

- The impact of emotion on time perception can be due to **arousal**, **attention**, or **bias** in the decision process

- Arousal:** emotion increases pacemaker rate (Droit-Volet et al., 2004)

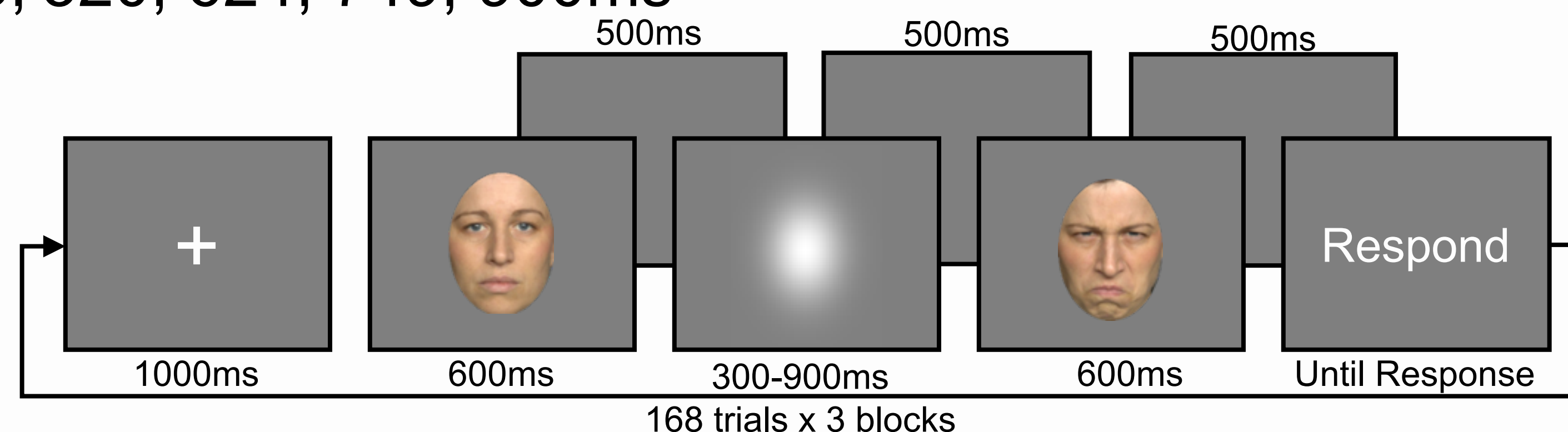
- Attention:** emotion causes attentional effects on the switch/gate (Lui et al., 2011)

- Bias:** emotion biases response probabilities (Lieving et al., 2006; Wiener & Thompson, 2015)

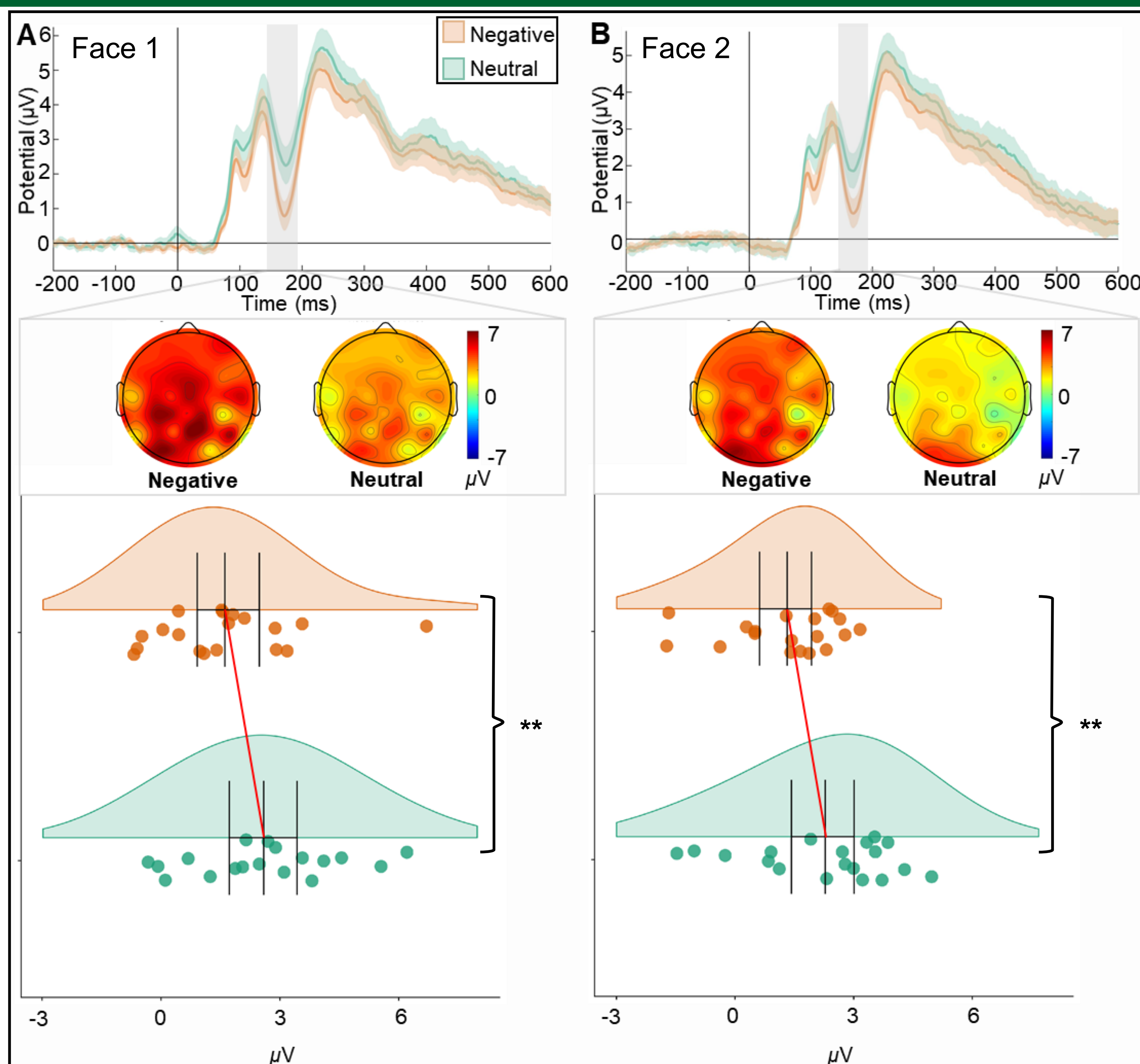


## Method

- Participants: 19 (13 Female, 4 Male, 2 Undisclosed; Age  $M = 21.25$ )
- Stimuli: four males and four females each with a negative and neutral expression from FACES data set (Ebner et al., 2010); Gaussian blur
- Conditions: Negative first, Neutral second (Neg-Neut); Neutral first, Negative second (Neut-Neg); Neutral first, Neutral second (Neut-Neut)
- Durations: 300, 360, 433, 520, 624, 749, 900ms
- Bisection Point
- 64 channel actiCAP slim
- N170, N1, CNV, LPCt



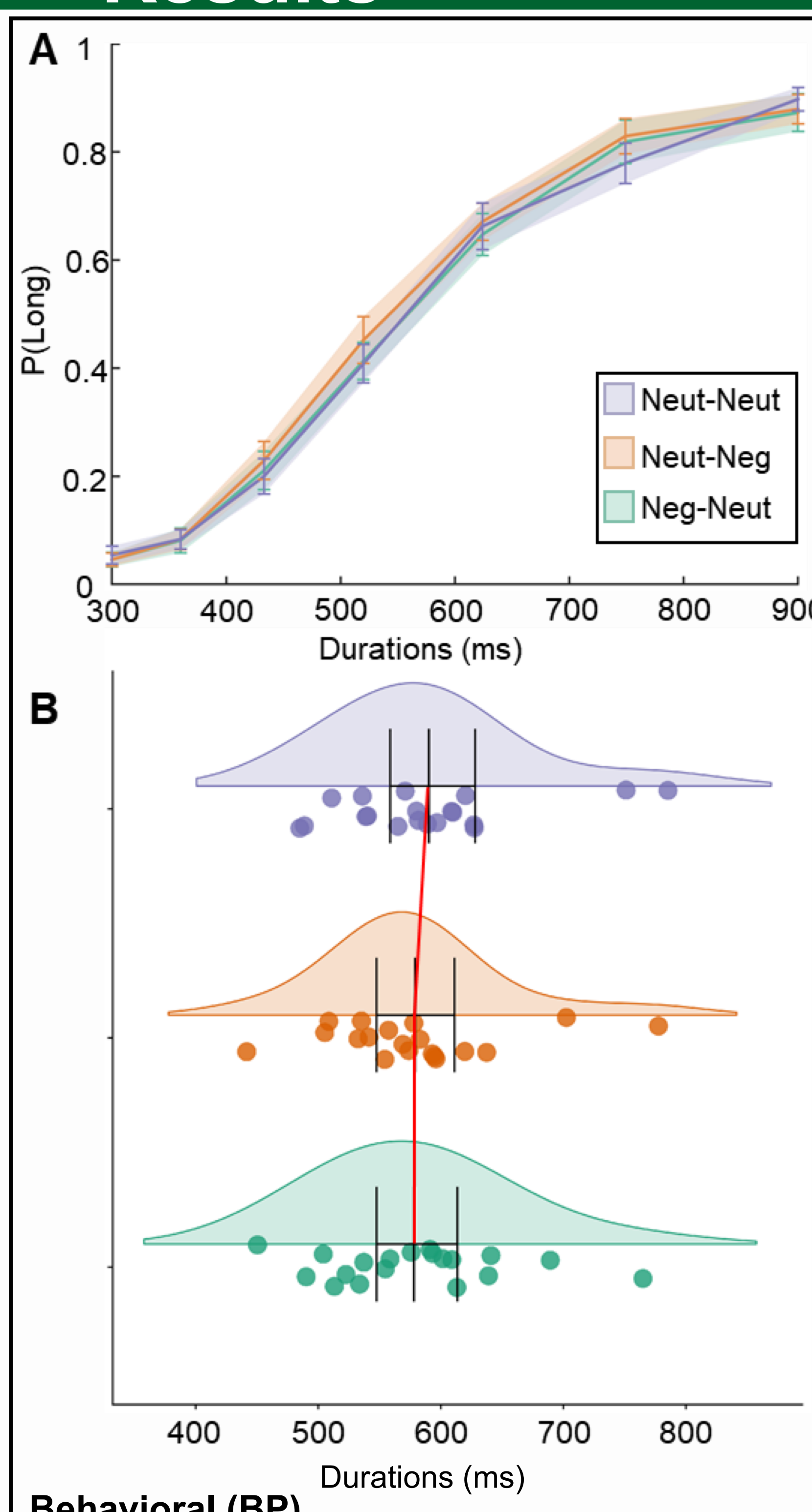
## Results



**N170 (145-185ms) P7, P8, PO7, PO8**

\*\* =  $p < .001$

No significant effect of face order or interaction.



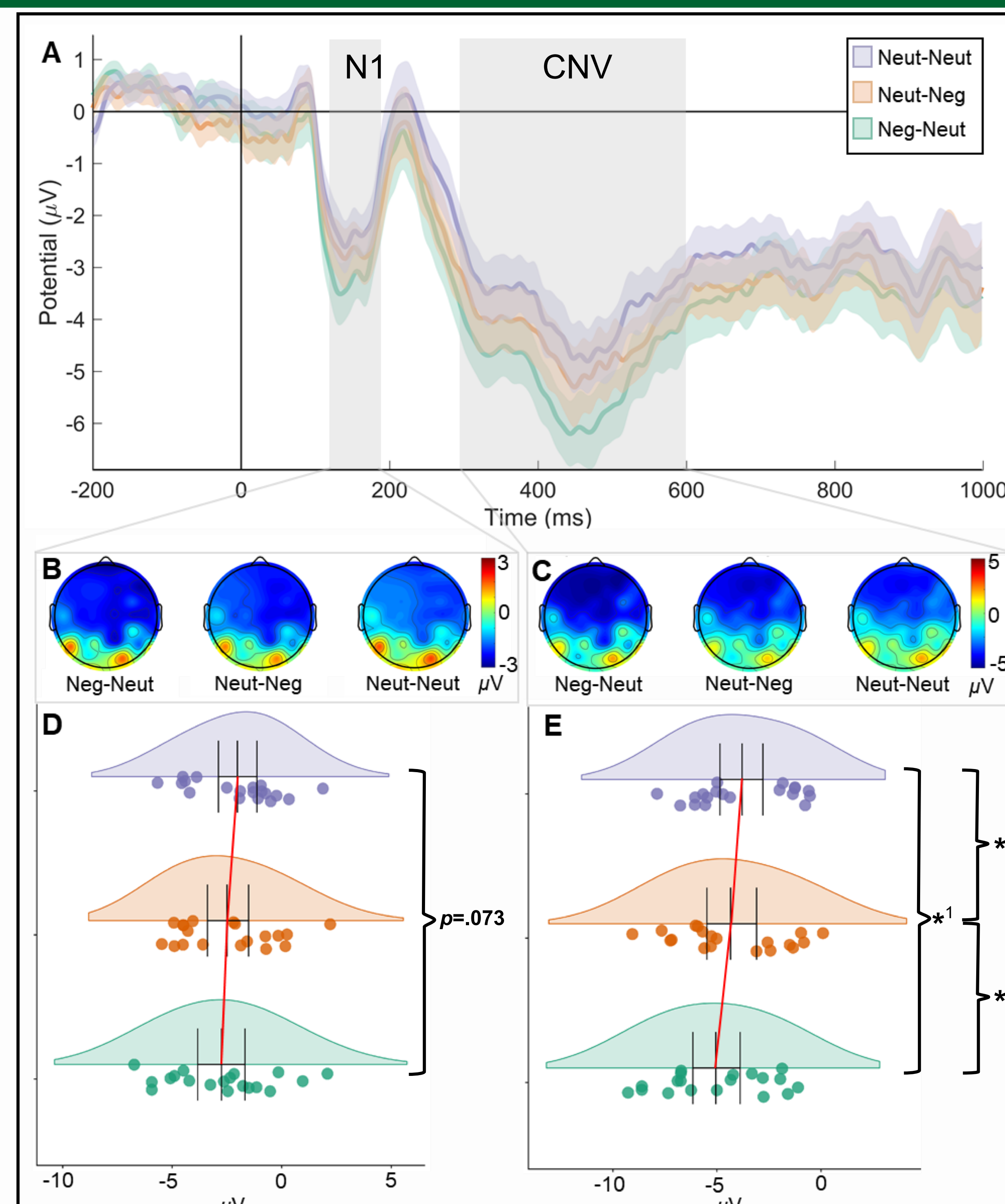
**Behavioral (BP)**

Neut-Neut BP =  $590 \pm 17.54$ ;

Neut-Neg BP =  $579 \pm 16.79$ ;

Neg-Neut BP =  $578 \pm 17.04$ ;

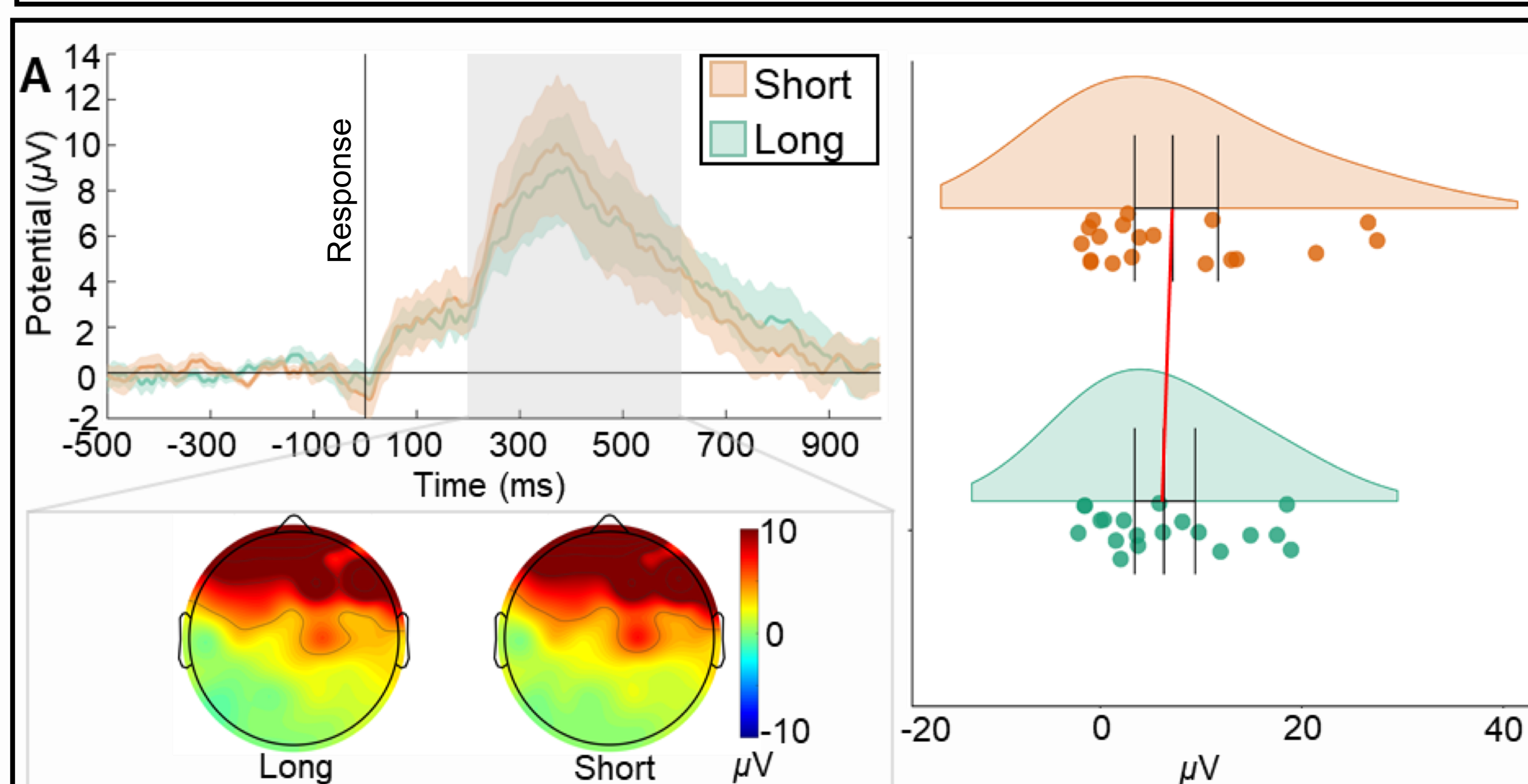
No significant effect, however, going in expected direction



**N1 (150-190ms) FCz, F2, Cz, F1, F2, FC1, FC2, C1, C2**

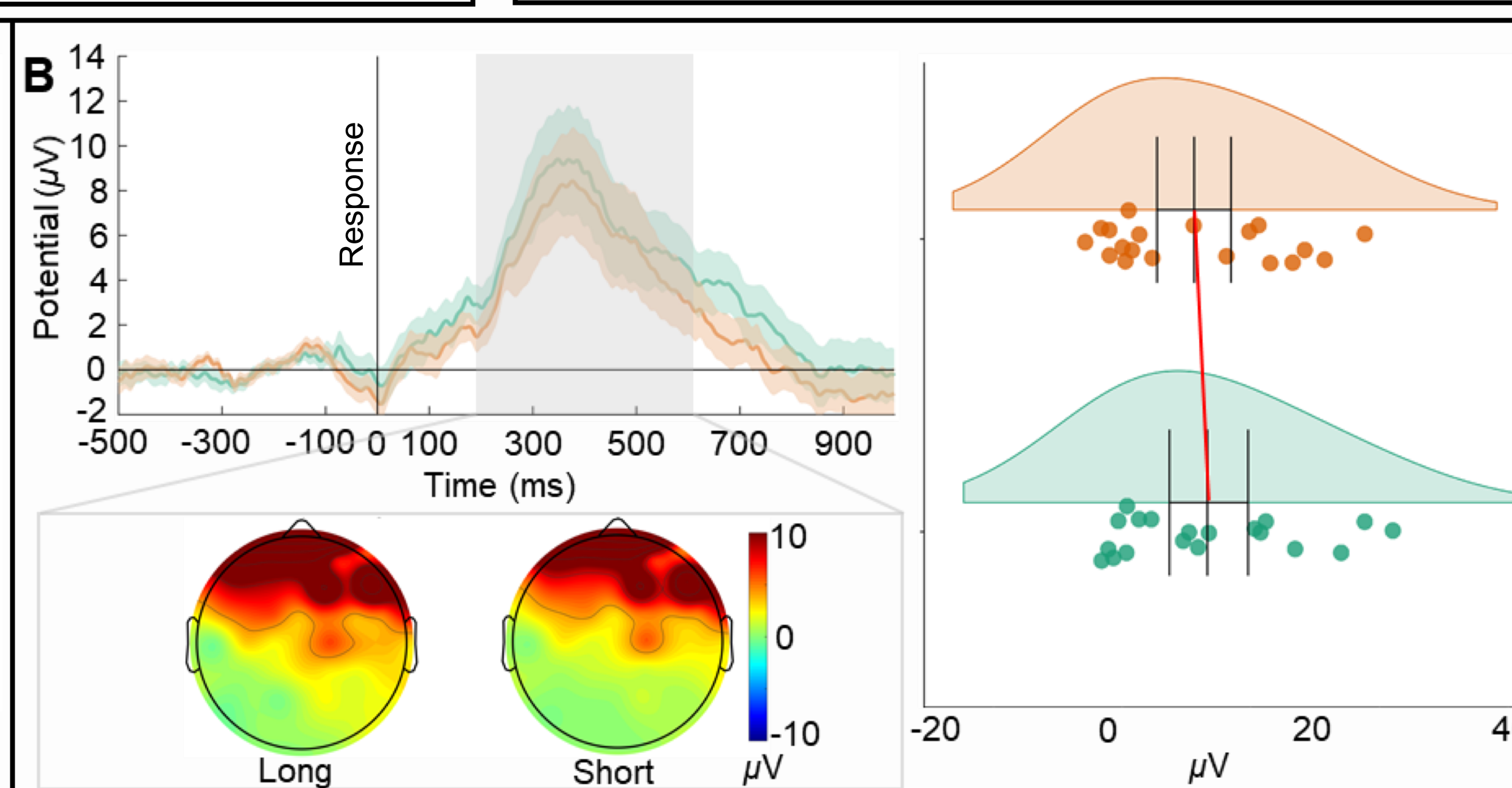
**CNV (300-600ms) FCz, Fz, Cz, F1, F2, FC1, FC2, C1, C2**

p-values: \*<sup>1</sup> = .007; \*<sup>2</sup> = .032; \*<sup>3</sup> = .023



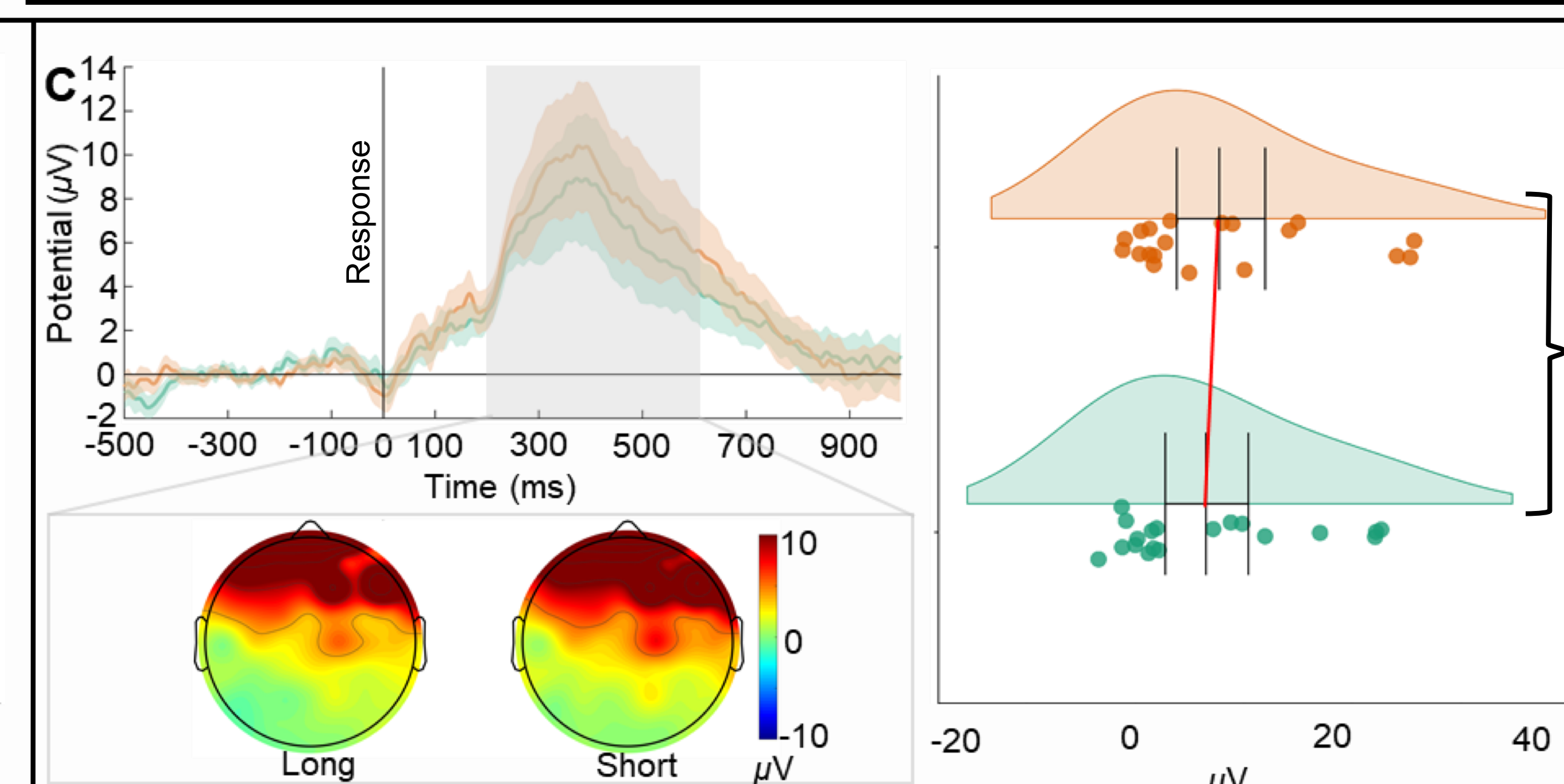
**LPCt – Neg-Neut (200-600ms) Fz, FC1, Cz, FCz, F1, C1, C2, F2, FCz**

Neg-NeutS > Neut-NegS ( $p = .066$ )



**LPCt – Neut-Neg (200-600ms) Fz, FC1, Cz, FCz, F1, C1, C2, F2, FCz**

Neut-NegS < Neut-NeutS ( $p < .001$ )



**LPCt – Neut-Neut (200-600ms) Fz, FC1, Cz, FCz, F1, C1, C2, F2, FCz**

\* =  $p < .05$

## Conclusion

- N170 = larger for negative faces than neutral faces, indicates negative face is more arousing and should lead to time overestimation
- BP = not significantly different but slight changes in expected direction across condition. P(Long) increased in Neg-Neut and Neut-Neg
- N1 = Neg-Neut marginally different from Neut-Neut suggests that attention is increased after seeing a negative face
- CNV = significantly different across conditions, suggests participants perceived the duration as lasting longer in Neg-Neut and Neut-Neg
- LPCt = significantly different between short and long for Neut-Neut; significantly different for short between Neut-Neg and Neg-Neut and almost significantly for Neg-Neut and Neut-Neg
- Negative face before temporal stimulus increases time perception as evidenced by the CNV magnitude and slightly supported by BP data
- N170 suggests effect could be due to arousal and N1 suggests attention is increased after seeing a negative face, could be either
- Negative face before a response causes decision making bias