



A FACE CAN ACQUIRE AN EMOTIONAL ASSOCIATION FROM A SINGLE INCIDENTAL PAIRING WITH AN EMOTIONAL SCENE

Harlan M. Fichtenholtz¹, Elise Christopher², Marcia K. Johnson², & Gregory McCarthy²

¹Department of Psychiatry, Yale University School of Medicine, New Haven, CT, ²Department of Psychology, Yale University, New Haven, CT.

INTRODUCTION

Compared to neutral scenes, emotional scenes elicit larger occipital P1 and parietal P3 components (e.g. Schupp et al., 2003). Reaction times (RTs) to stimuli that immediately follow an emotional scene are longer than RTs to stimuli that follow a neutral scene, suggesting a detrimental impact of emotion on the processing of subsequent stimuli (Fichtenholtz & LaBar 2006).

We assessed the impact of task irrelevant emotional and neutral scenes on the processing of immediately subsequent face stimuli. We also assessed the neural responses evoked by these faces when repeated later in the task within a neutral context.

A. We predicted that the neural response evoked by repeated faces that initially followed an emotional scene would exhibit evidence of a learned emotional association later in a neutral context.

We also compared the neural activity evoked by repeated faces to novel faces that were not shown earlier in the task.

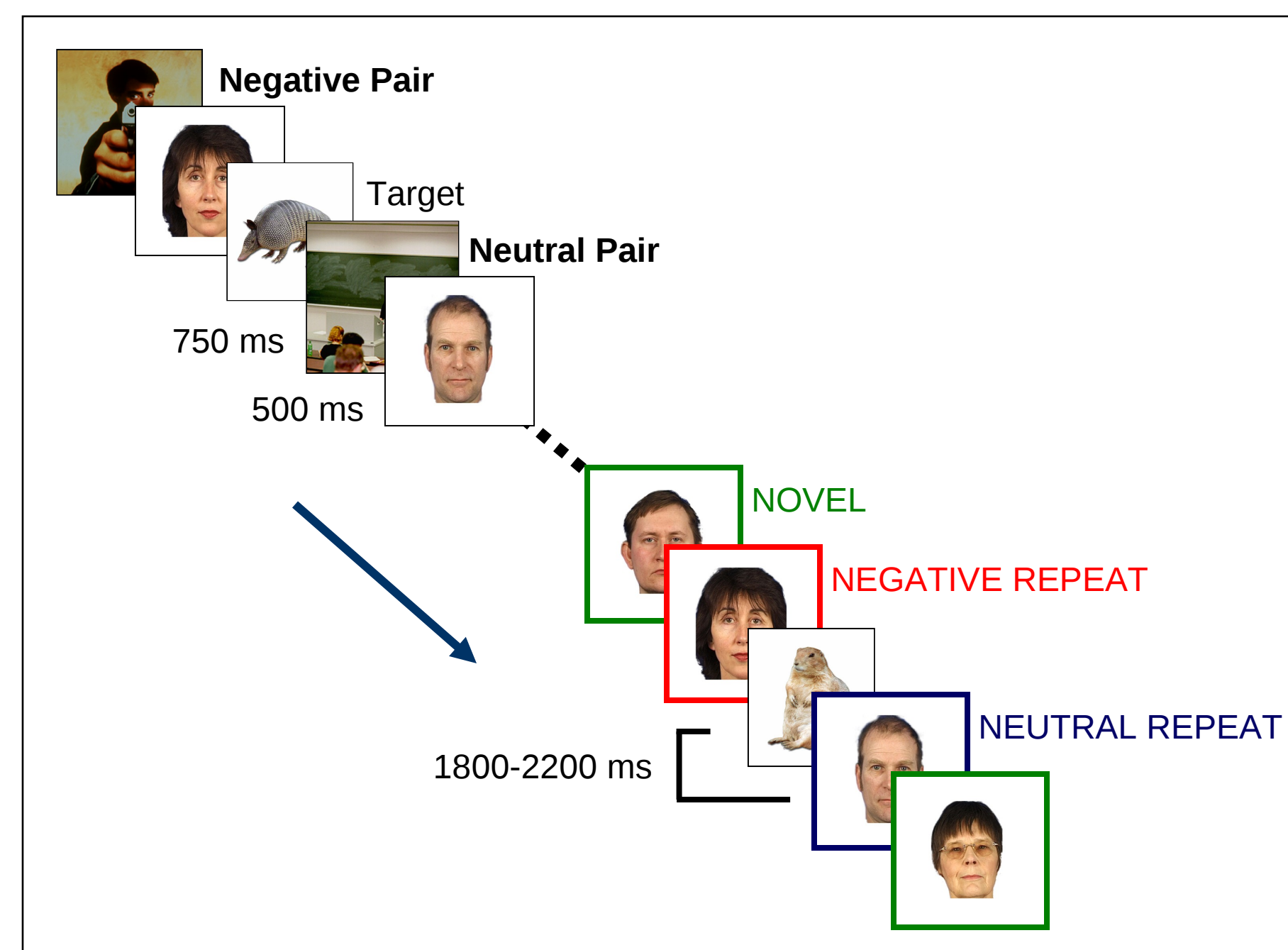
B. We predicted that the encoding of faces that immediately followed emotional scenes was compromised and that the repetition of these faces in a neutral context would evoke additional processing more similar to the processing of a novel face.

METHOD

Participants

• 21 healthy young adults (M 20.47 years old +/- SD 2.07; 8 males)

Task Design



Delayed Repetition Paradigm (6 Blocks)

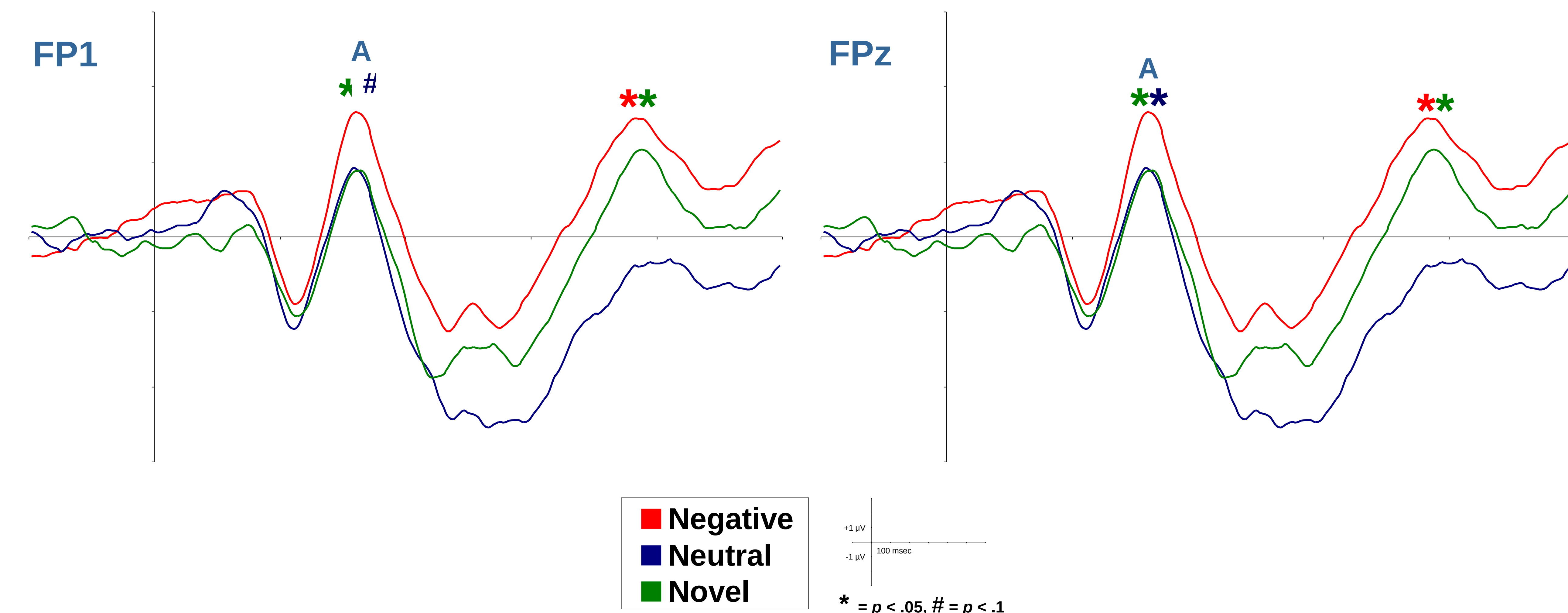
- First Third of Block
 - Scene-Face Pairs:
 - ½ Negative Scenes, ½ Neutral Scenes; all Neutral Faces
 - Scene-Object Pairs
 - Animals (Targets)
 - Remainder of Block
 - Repeated Faces: **NEGATIVE**, **NEUTRAL**
 - **NOVEL** Faces
 - Objects
 - Animals (Targets)
 - Subjects responded to the presence of an animal target
- Recognition Memory Test

Data Recording and Analysis

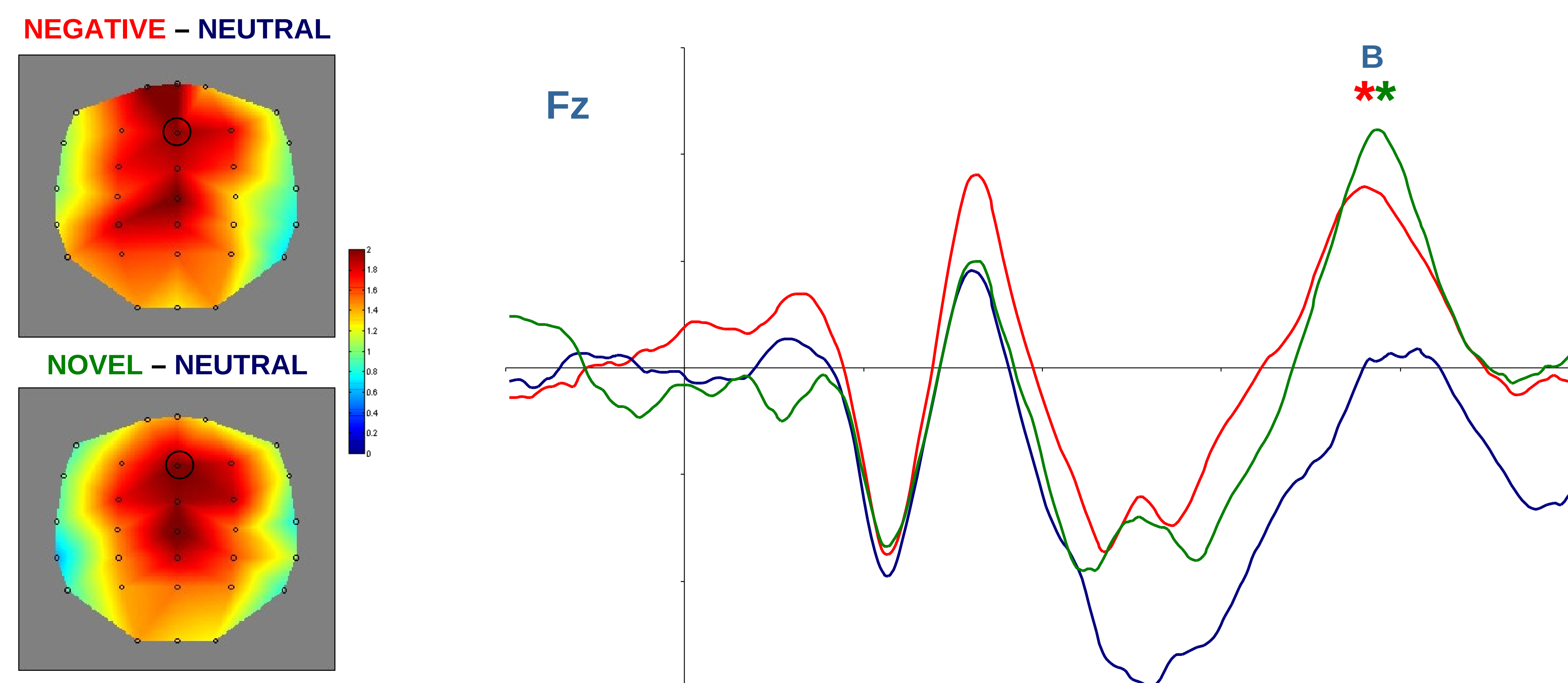
- ERP recordings: 32 electrodes, modified 10-20 system, bandpass filtered (0.1 - 100 Hz), sampling rate = 250 Hz.
- ERP averages were calculated for each stimulus type.
 - e.g., "Negative" Faces, "Neutral" Faces, Novel Faces

ERP RESPONSES TO REPEATED & NOVEL FACES

A. Evidence for a Learned Emotional Association @ ~ 170msec

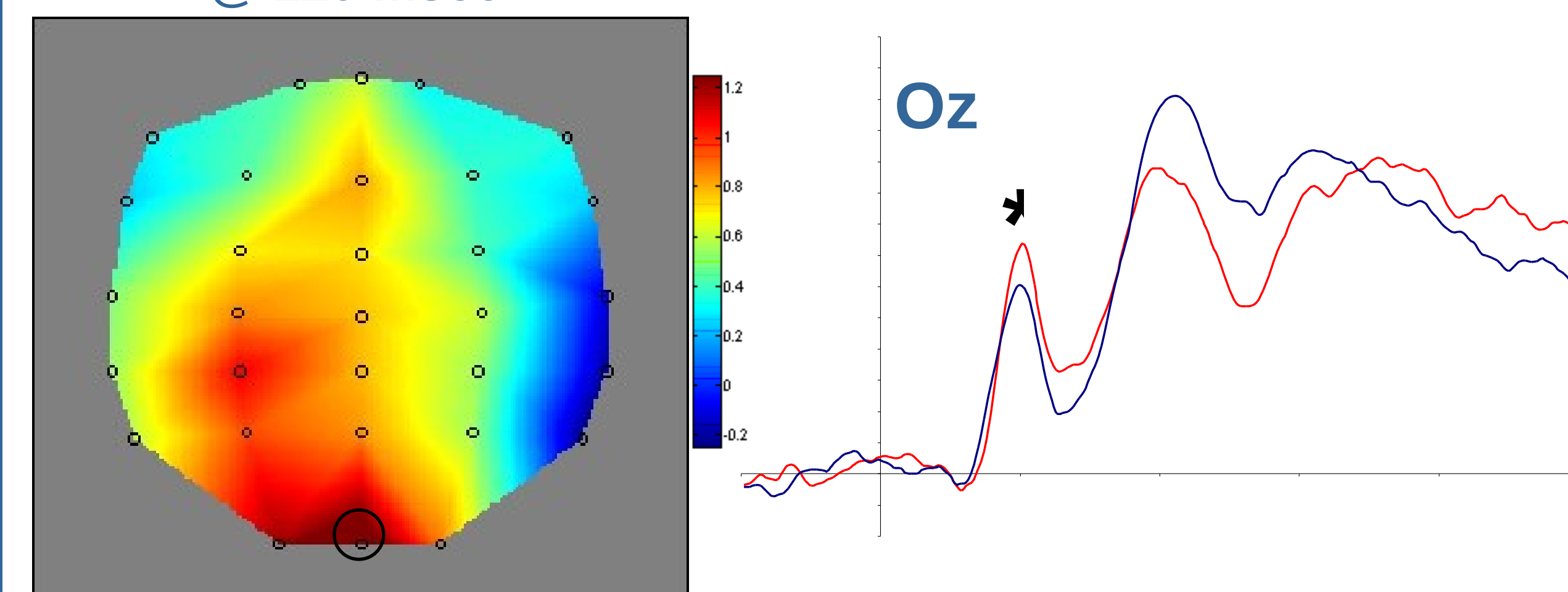


B. Enhanced Processing for Repeated Negative and Novel Faces @ ~ 370msec

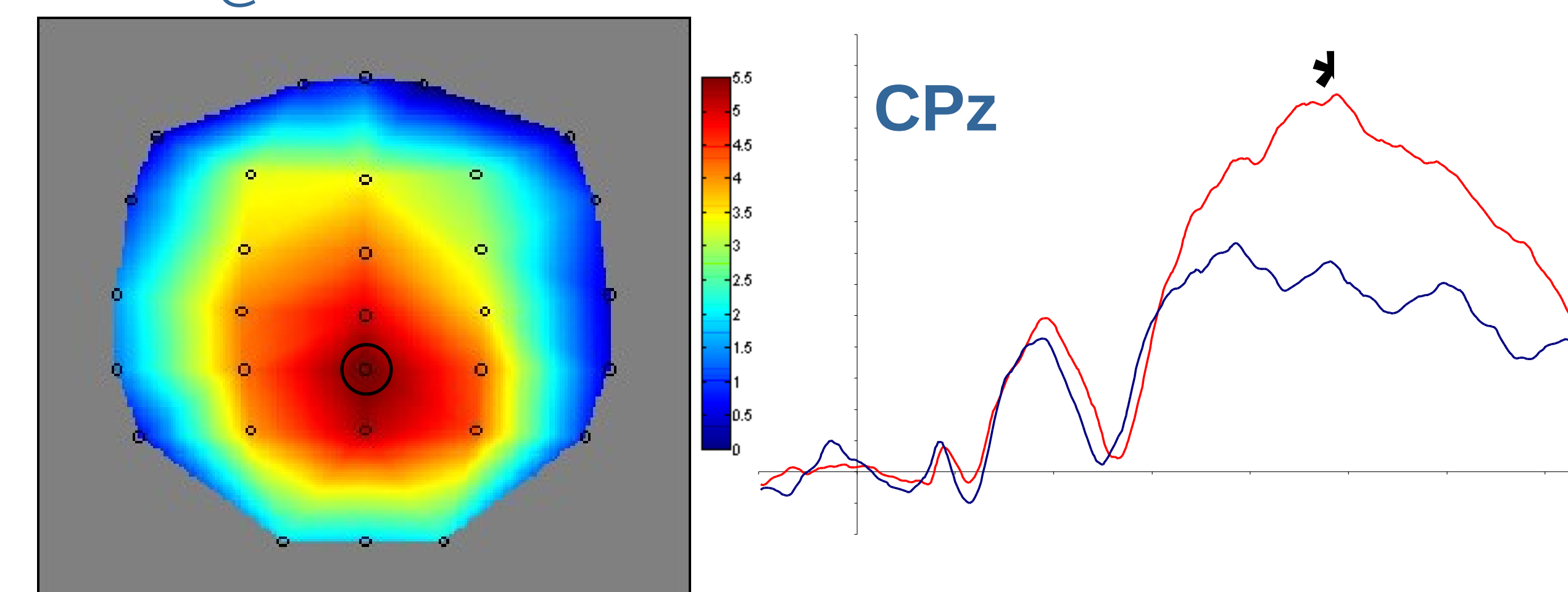


ERP RESPONSES TO NEUTRAL & NEGATIVE SCENES

Negative - Neutral Scenes @ 120 msec

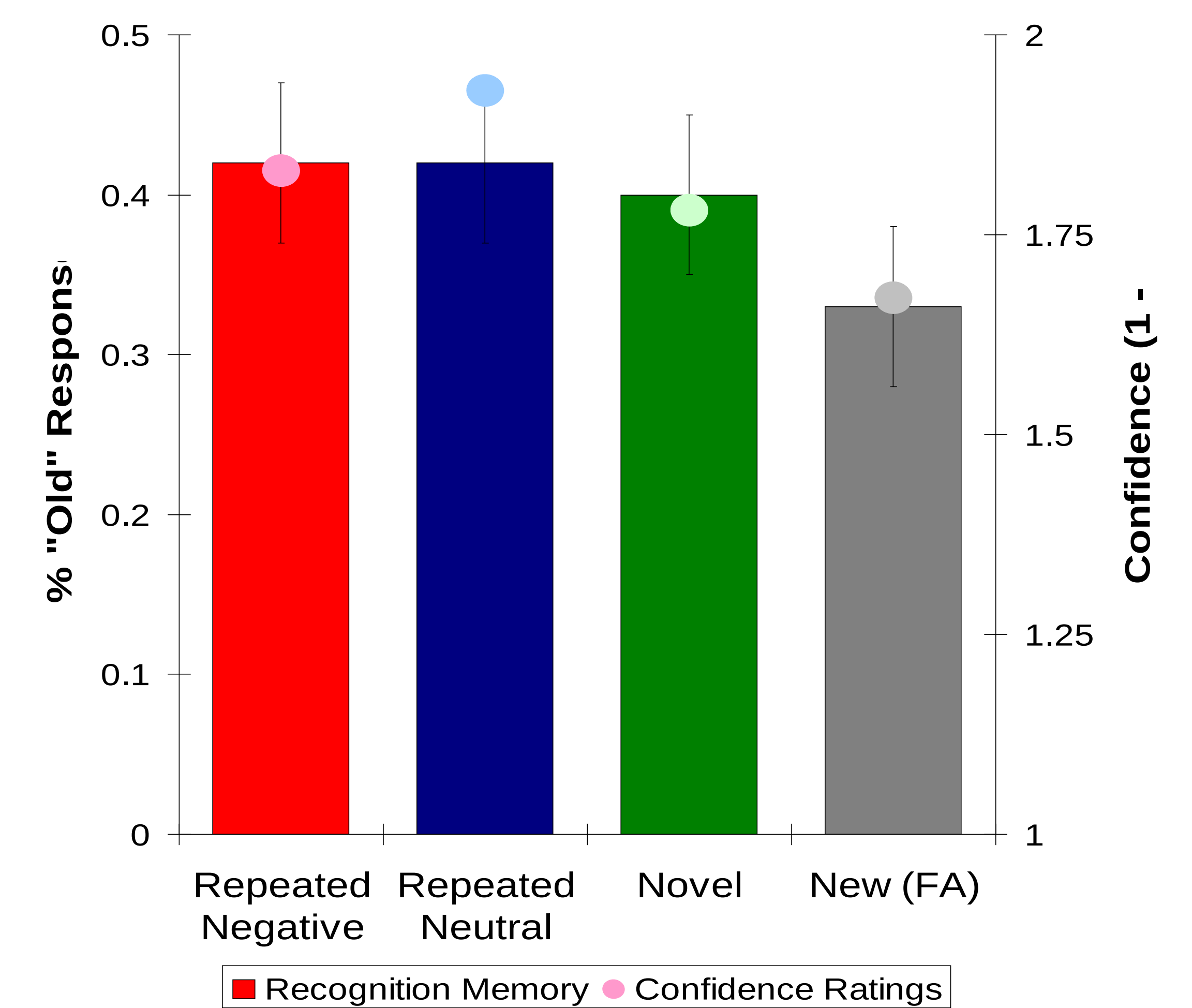


Negative - Neutral Scenes @ 450 msec



Legend: Negative (Red), Neutral (Blue). Scale: 1 µV, 100 msec. * = p < 0.05

Recognition Memory Performance



SUMMARY

- Behavior
 - Recognition: No Difference with Repetition
 - Confidence: **NEGATIVE** > NEW (FA)
NEUTRAL > **NOVEL**/NEW (FA)
NOVEL > NEW (FA)
- ERP Effects
 - Affective Association @ ~170 msec:
 - **NEGATIVE** > **NOVEL**/NEUTRAL
 - Repetition: @ ~350-390 msec
 - **NEGATIVE**/NOVEL > NEUTRAL

DISCUSSION

- Consistent with previous studies of emotional scene processing (Schupp et al., 2003), ERPs to negative scenes showed enhanced P1 and P3 responses compared to neutral scenes.
- There was increased fronto-polar positivity within the first 200 msec for faces previously encoded in a negative context, suggesting that emotional associations are acquired on a single trial.
- The fact that faces following emotional scenes did not differ from Novel faces (and both greater than Neutral) at 350-400 msec indicates that emotion disrupted encoding of the faces.

REFERENCES

Fichtenholtz *et al.* (In Prep). An Early ERP Repetition Effect for Remembered Compared to Forgotten Faces.
 Fichtenholtz & LaBar (2006). Aging Prolongs Emotional Distraction during an Attentional Task. Annual meeting of the Cognitive Neuroscience Society.
 Schupp *et al.* (2003). *Psychological Science*, 14, 7-13.

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