

The Development of Neural Responses to Faces in Infancy

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Introduction

Infants show remarkable ability to detect faces even minutes after birth. The experience gained with faces in the first months of life is critical to promote infants' ability to adapt to their social environment. Studies investigating the neural responses to faces in infants showed that the N290 and the P400 components display some specificity for human faces¹. In a series of studies, we examined the development of brain responses to faces during the first year of life.

In **Experiment 1** we investigated the effect of low-level visual cues that differentiate faces and houses by comparing their intact and phase-scrambled versions. Neural responses were recorded in typically developing infants at 6 and 12 months of age.

Experiment 2 tested the effect of stimulus inversion on infants' neural responses to faces and houses. Upright and inverted stimuli were presented to infants at 3, 4.5, 6, 7.5, and 12 months of age.

We reconstructed the cortical source of the ERP signals using realistic, age-appropriate head models^{2,3}.

Conclusion

- Preliminary results of Experiment 1 suggest that both the N290 and P400 show larger response to intact faces by 12 months of age.
- Results of Experiment 2 indicate that both the N290 and P400 are sensitive to the stimulus inversion in the second half of the first year of life (i.e., after 6 months)
- Only the N290 showed a specific inversion effect for faces in 12-month-old infants.
- Source reconstruction of the N290 component at 12 months of life suggest a larger activity in the Fusiform Gyrus in response to faces than control stimuli (e.g., scrambled and inverted faces)

References

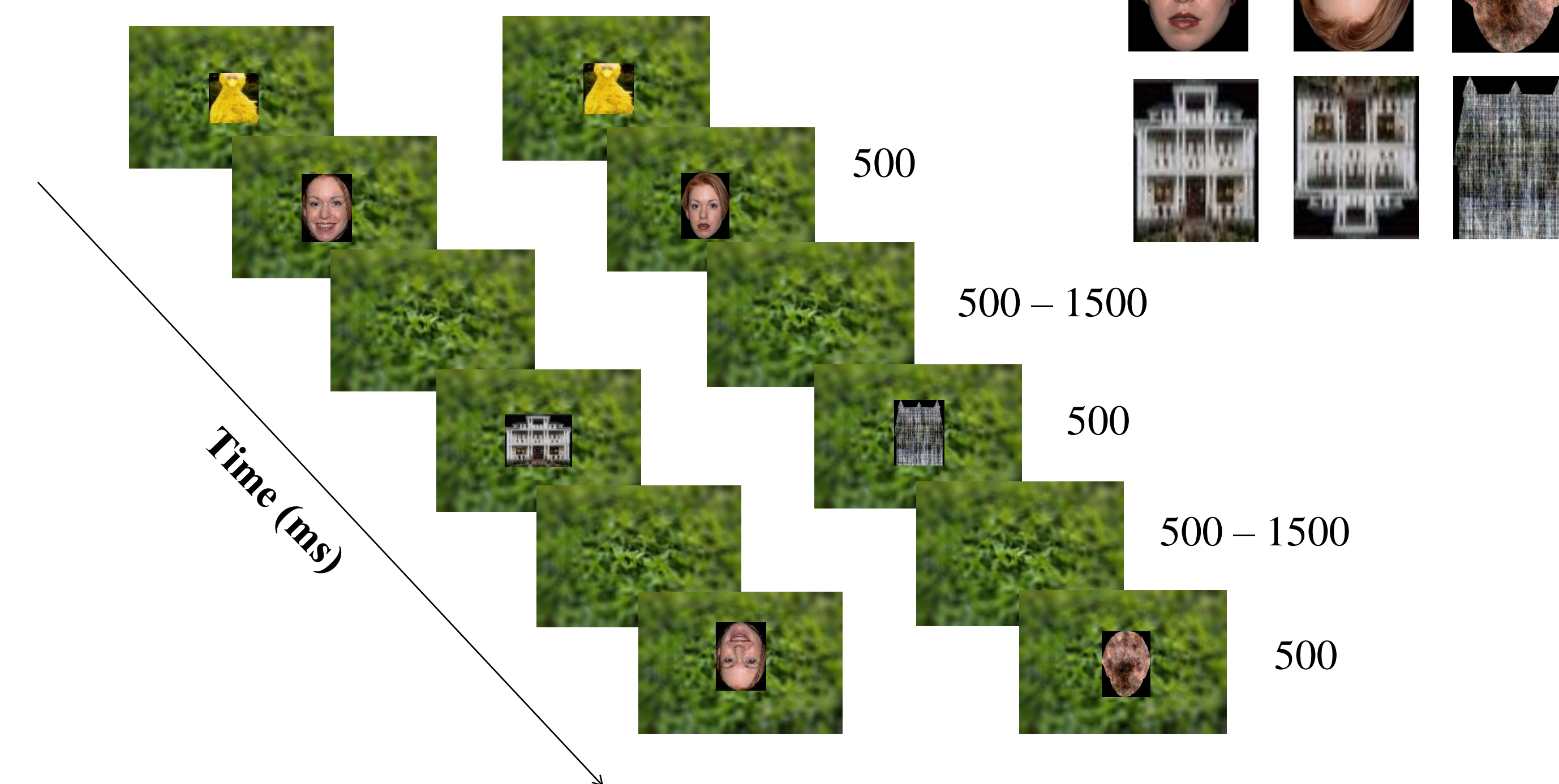
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2. Guy, M W Zieber N Richards, J E (2016). The cortical development of specialized face processing in *infancy Child development* 87(5), 1581-1600.
3. Reynolds, G. D., & Richards, J. E. (2009). Cortical source localization of infant cognition. *Developmental neuropsychology*, 34(3), 312-329.

Methods

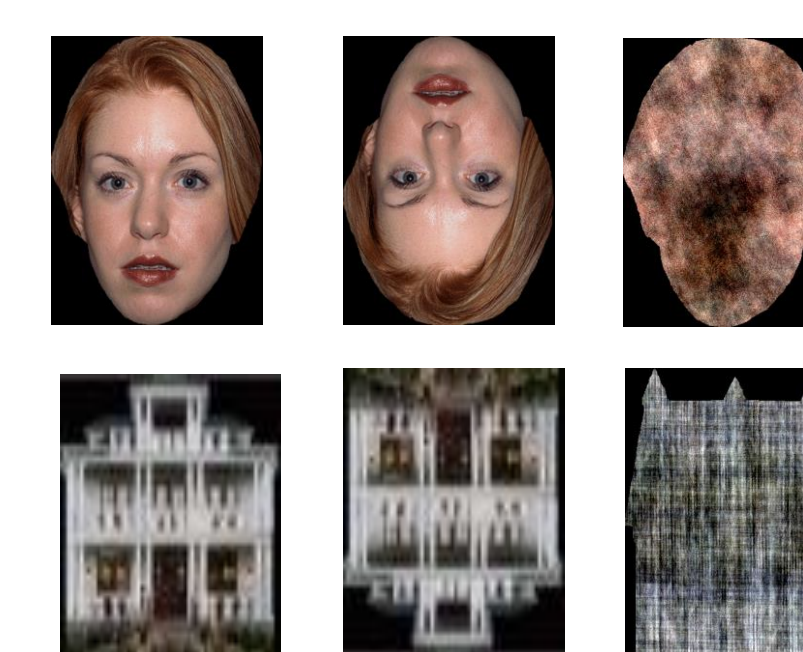
Participants

	3 months	4.5 months	6 months	7.5 months	12 months
Experiment 1	n/a	n/a	10	n/a	8
Experiment 2	6	9	7	5	12

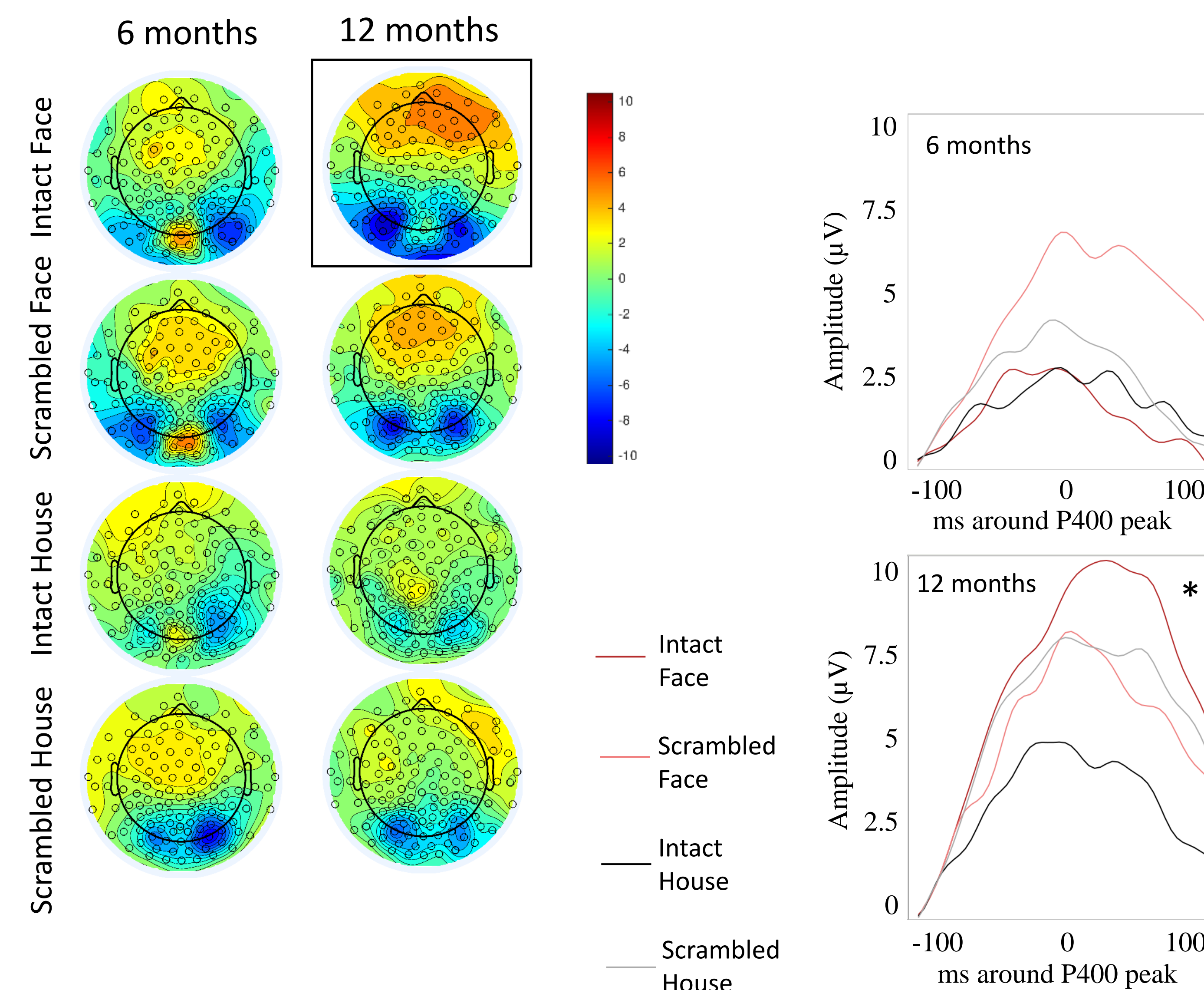
Procedures



Stimuli



Results Experiment 1



Results Experiment 2

