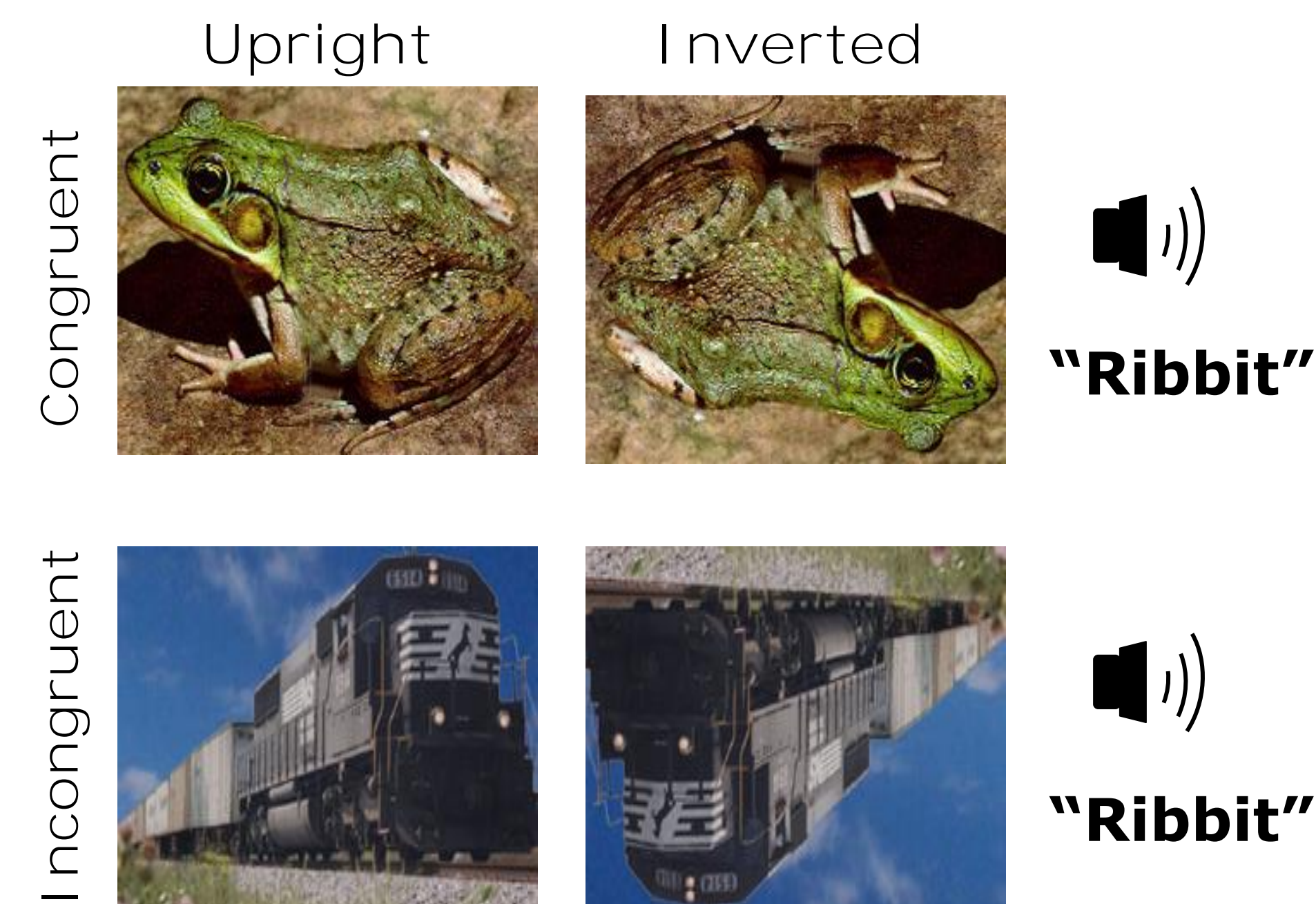


Introduction

This EEG study investigated age-related effects of irrelevant congruent or incongruent audio semantic information on living and nonliving visual object processing.

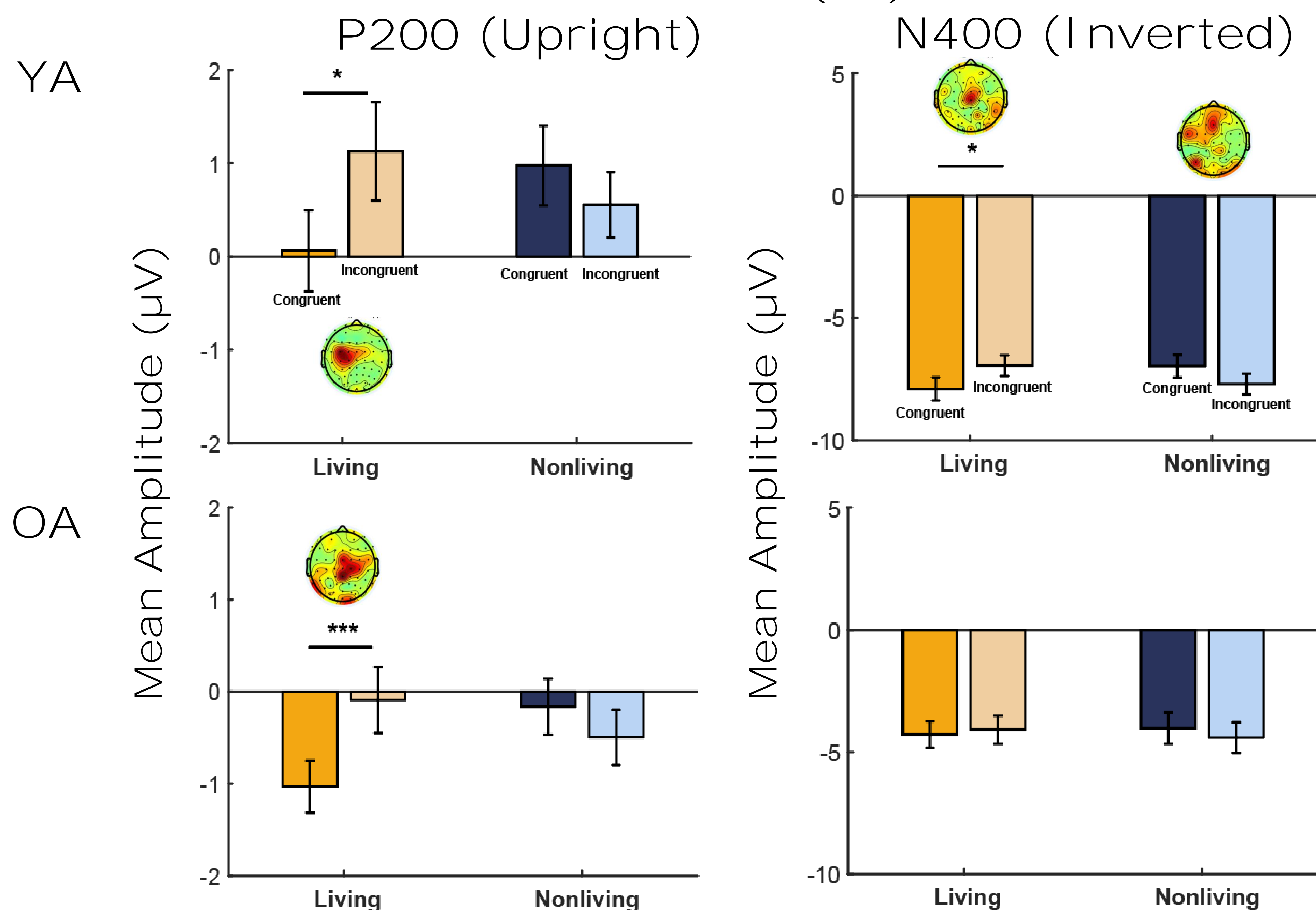
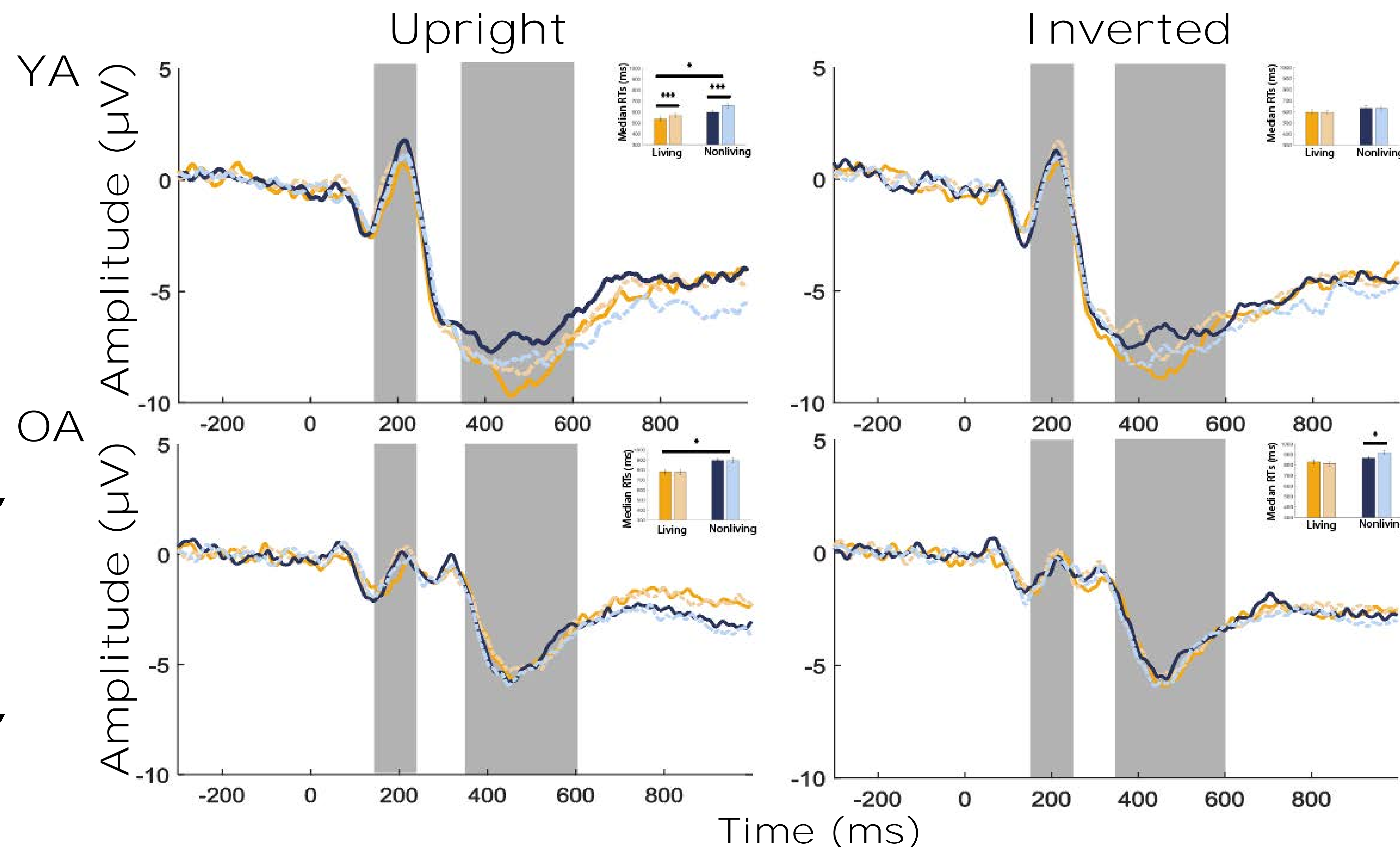
Stimuli



Task: Is the object upright or inverted?

Methods

- Participants: 24 YA (Mean Age = 20.96), 30 OA (Mean Age = 71.77).
- Task: Participants made speeded orientation judgments to upright or inverted images of living and nonliving objects. Each picture was presented with an irrelevant congruent or incongruent audio stimulus.
- Behavioral Measures: Accuracy and median reaction time (RT, ms).
- ROI: FC1, FCZ, FC2, C1, CZ, C2
- ERP Measures: N400 [350-600 ms] and P200 components [180-210 ms]. Mean amplitude was extracted from the ROI cluster.
- Data Analysis: Repeated measures ANOVAs with orientation, congruency, and animacy as factors for both median RTs and mean ROI amplitudes in each group.



Summary

- Overall, YAs and OAs were faster at responding to living compared to nonliving objects in the upright orientation.
- P200: For both YAs and OAs, audiovisual semantic congruency modulated the P200 amplitude for living, but not for nonliving objects.
- N400: YAs showed different patterns of audiovisual semantic congruency modulation on N400 amplitude elicited by living and nonliving objects. For living objects, congruent stimuli triggered a more negative amplitude than incongruent stimuli, and the reverse for nonliving objects.
- OAs: No modulation of N400 by congruency for living nor nonliving objects.

Conclusions

- The perception of canonically represented living objects may be facilitated through an automatic perceptual template matching process. In contrast, nonliving object perception may require a functional integration of their perceptual properties¹.
- YAs and OAs show intact early object processing which may be associated with perceptual template matching for canonical objects (e.g., upright, living). Absent N400 effect in OAs suggests deficits in later semantic integration.

References

[1] Warrington, E.K., & Shallice, T. (1984). Category-specific semantic impairment, *Brain*, 107(3), 829-853.