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Expressive suppression to faces and IAPS pictures: Common and differential neural networks

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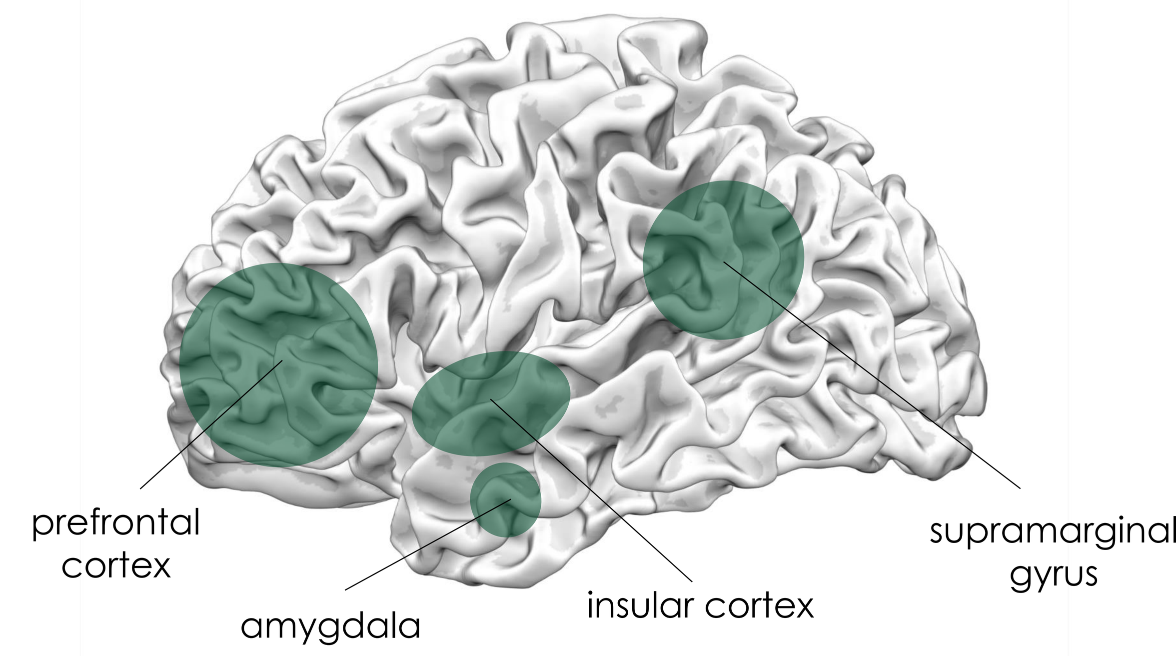
SOCIAL & CULTURAL NEUROSCIENCE LABORATORY

Poster Number: 1773

Introduction

Background

- *Expressive suppression* is the voluntary inhibition of facial expressions when viewing negative stimuli (Gross et al., 2003).
- Compared to the more widely studied emotion regulation strategy *cognitive reappraisal*, expressive suppression is associated with heightened physiological arousal, greater negative affect, and may involve temporally later recruitment of prefrontal cortical areas (Goldin et al., 2008; Dörfel et al. 2014; Vrtička et al., 2012).



Neural correlates of expressive suppression
Cutuli (2014)

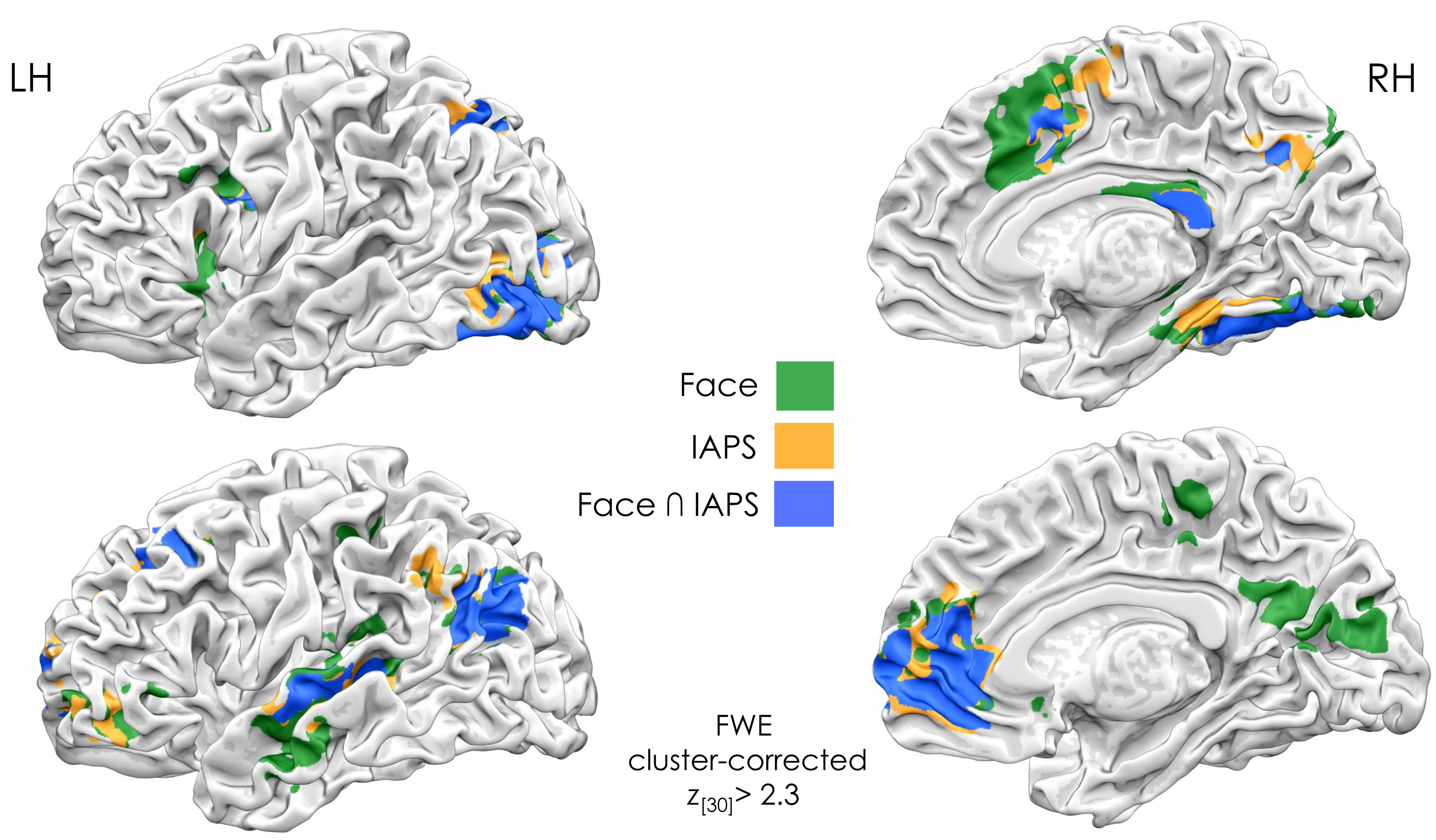
Research Questions

1. Do prior findings on the effects of expressive suppression generalize to different stimulus types?

2. Are there temporal differences in expressive suppression-related brain activity across stimulus types?

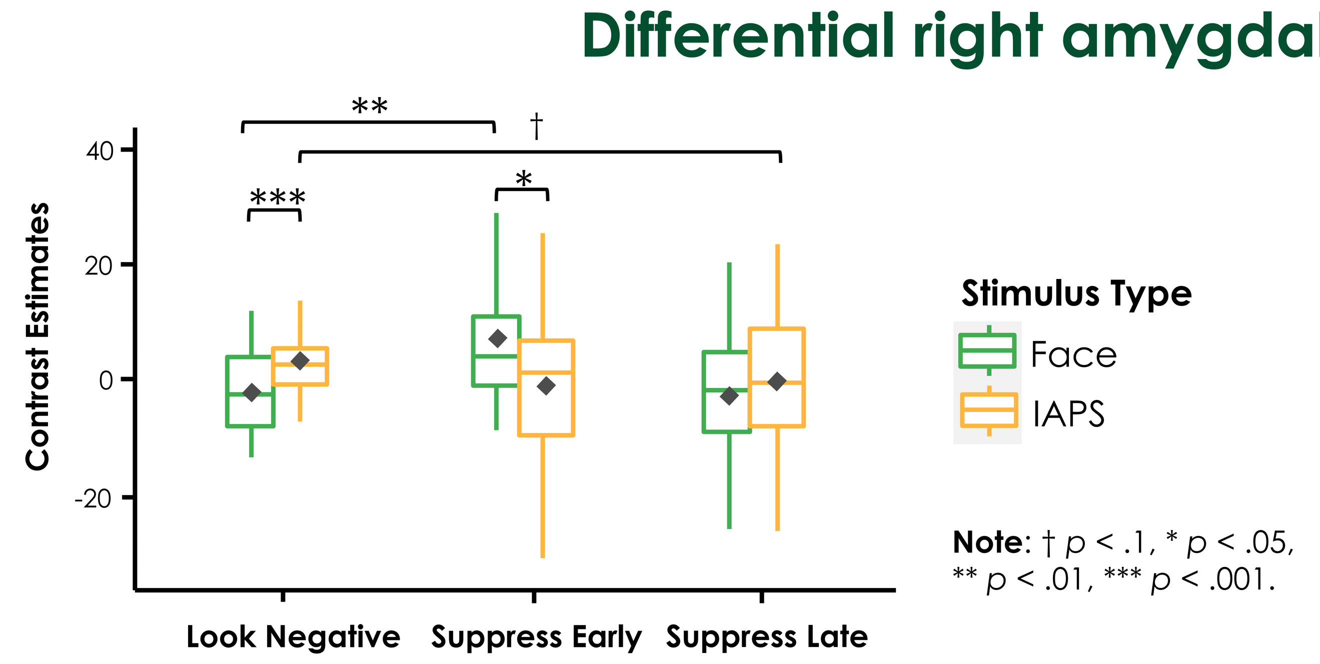
Results & Conclusions

Common activation across stimulus types during early and late suppression



- For the early period of suppression, both pain faces and IAPS pictures activated the occipital cortex, fusiform gyrus, supramarginal gyrus, and precentral gyrus.
- During the late period of suppression, there was additional common activation in the anterior cingulate cortex and superior frontal gyrus.
- **Findings suggest common recruitment of brain regions across stimulus types, and more recruitment of prefrontal cortex areas in the late vs. early part of suppression.**

Differential right amygdala activation by temporal period and stimulus type



- In a region-of-interest (ROI) analysis focusing on the amygdala, we found that the change in right amygdala activation from passive viewing to expressive suppression differed by stimulus type and time, with an increase in activation during the early period of suppression to pain faces, but a decrease in activation during the late period of suppression to IAPS.
- **Findings suggest expressive suppression to pain faces vs. negative IAPS pictures may induce more negative affect initially, and be less effective at reducing negative affect by the end of the stimulus perception period.**

Conclusions

- Our findings provide evidence that common brain regions underlie expressive suppression to different stimulus types, and that the amygdala may be particularly important in differentiating the expressive suppression response to pain faces vs. IAPS pictures.
- These results add to our understanding of the generalizability of the effects of expressive suppression, and identify the temporal period of the expressive suppression response as an important consideration for future studies.

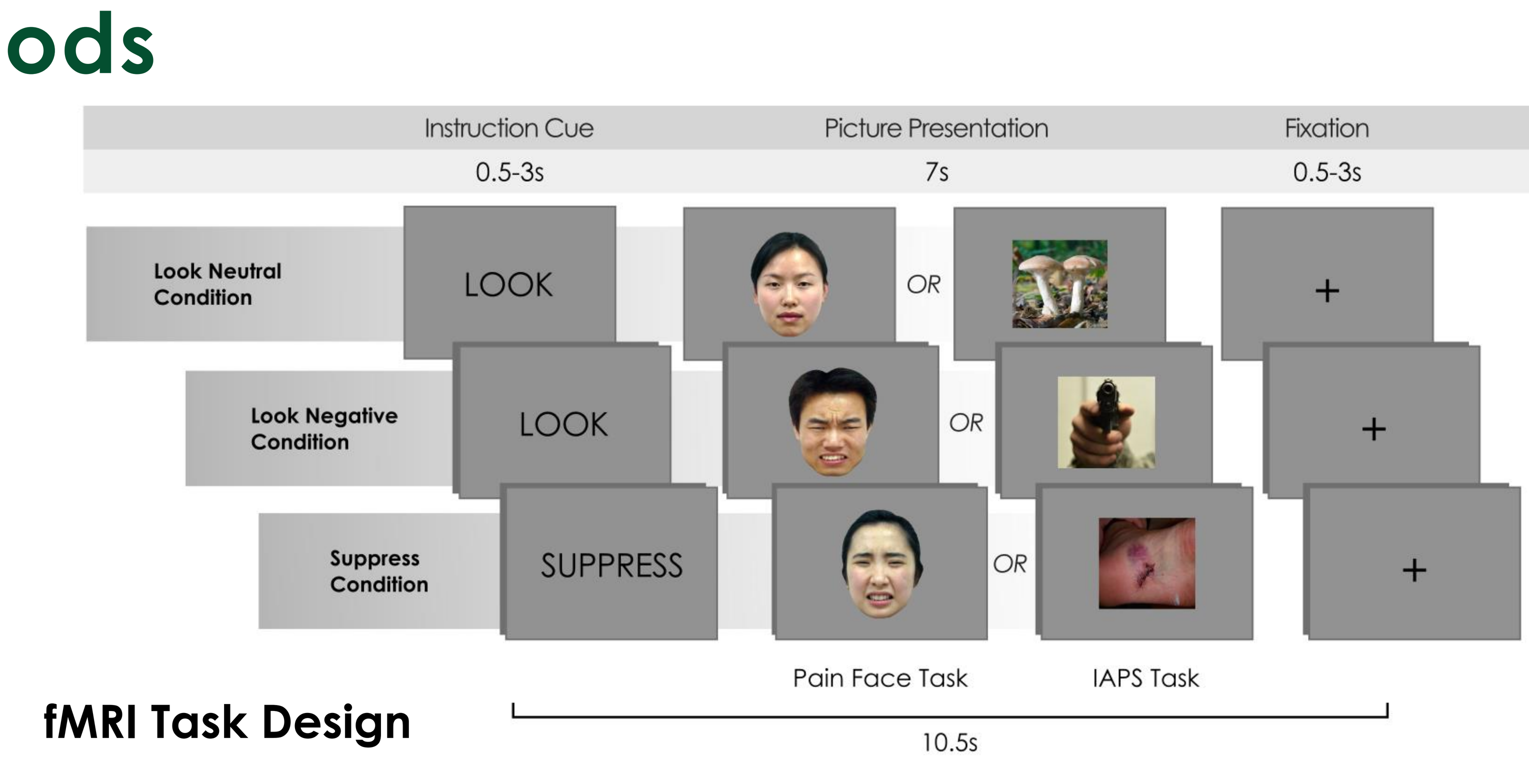
Methods

Study Design

- 30 (15 female) healthy adults, ages 19-29 scanned at Peking University in Beijing, China.
- Participants underwent fMRI while engaging in passive viewing and expressive suppression to pain/neutral expression faces (Sheng et al., 2014) and negative/neutral pictures from the International Affective Picture System (IAPS; Lang et al., 2007).

Analysis

- fMRI data preprocessing and analyses conducted in FSL version 5.0.9.
- To characterize the temporal aspects of expressive suppression, we separately modeled the early (0-3.5s) and late (3.5-7s) periods of the expressive suppression condition (Goldin et al., 2008).



fMRI Task Design

Acknowledgements: This research was supported by a National Science Foundation East Asia and Pacific Summer Institutes (NSF EAPSI) Fellowship (Award Number: 1713969) and a University of Miami Graduate Activity Fee Allocation Committee (GAFAC) Award.