

# Hemispheric facial dominance and emotion recognition: An MEG study

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## INTRODUCTION

- Emotion recognition has gained a lot of interest from psychologists and neuroscientists in the last few decades. Behavioural studies have reported hemifacial bias suggesting one-half of the face to be more expressive.
- Reaction time studies have also shown disparity in the processing latencies of emotional expressions, with happy expressions being processed faster than sad ones. Still, neurological evidence for such claims is missing.
- In this MEG study (N=13), the participants were presented with both positive (+90 & +45 degree) and negative (-90 & -45 degree) faces depicting Happy and Sad emotions to investigate the neural processing of right/positive and left/negative visual angle of the faces vis-a-vis emotion types. The data was collected at the MEG facility available at ISRC Ulster University.

## Stimuli

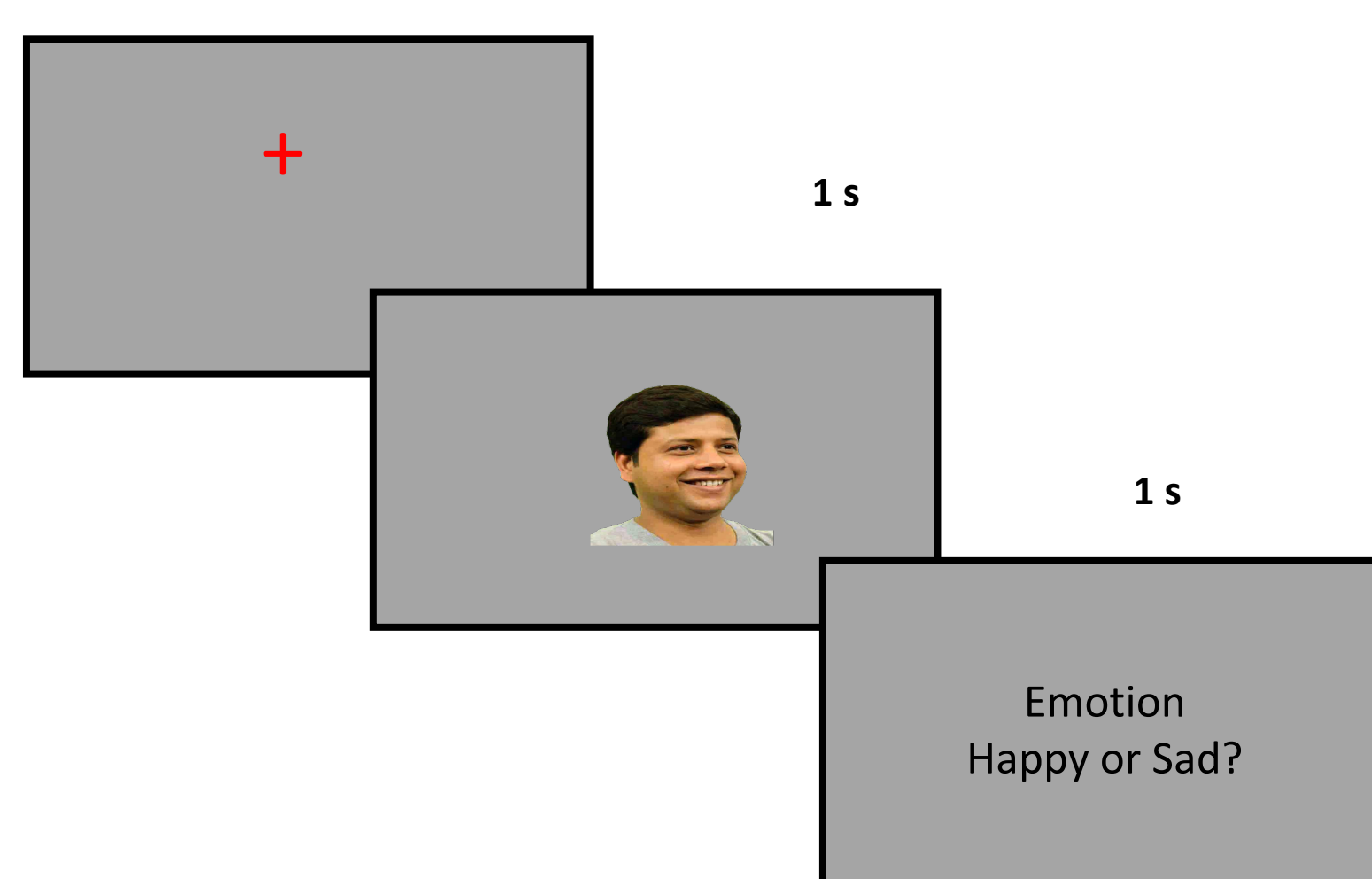


Figure: Human Faces with positive and negative facial angles and experimental paradigm.

## References:

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- Nara, S., Lizarazu, M., Richter, C.G., Dima, D.C., Cichy, R.M., Bourguignon, M., Molinaro, N., 2021a. Temporal uncertainty enhances suppression of neural responses to predictable visual stimuli. *Neuroimage* 239, 118314. <https://doi.org/10.1016/j.neuroimage.2021.118314>
- Nara, S., Rathee, D., Molinaro, N., Bois, N. Du, Bhushan, B., Prasad, G., 2021b. Temporal Dynamics of Neural Processing of Facial Expressions and Emotions. *bioRxiv* 2021.05.12.443280. <https://doi.org/10.1101/2021.05.12.443280>

## RESULTS

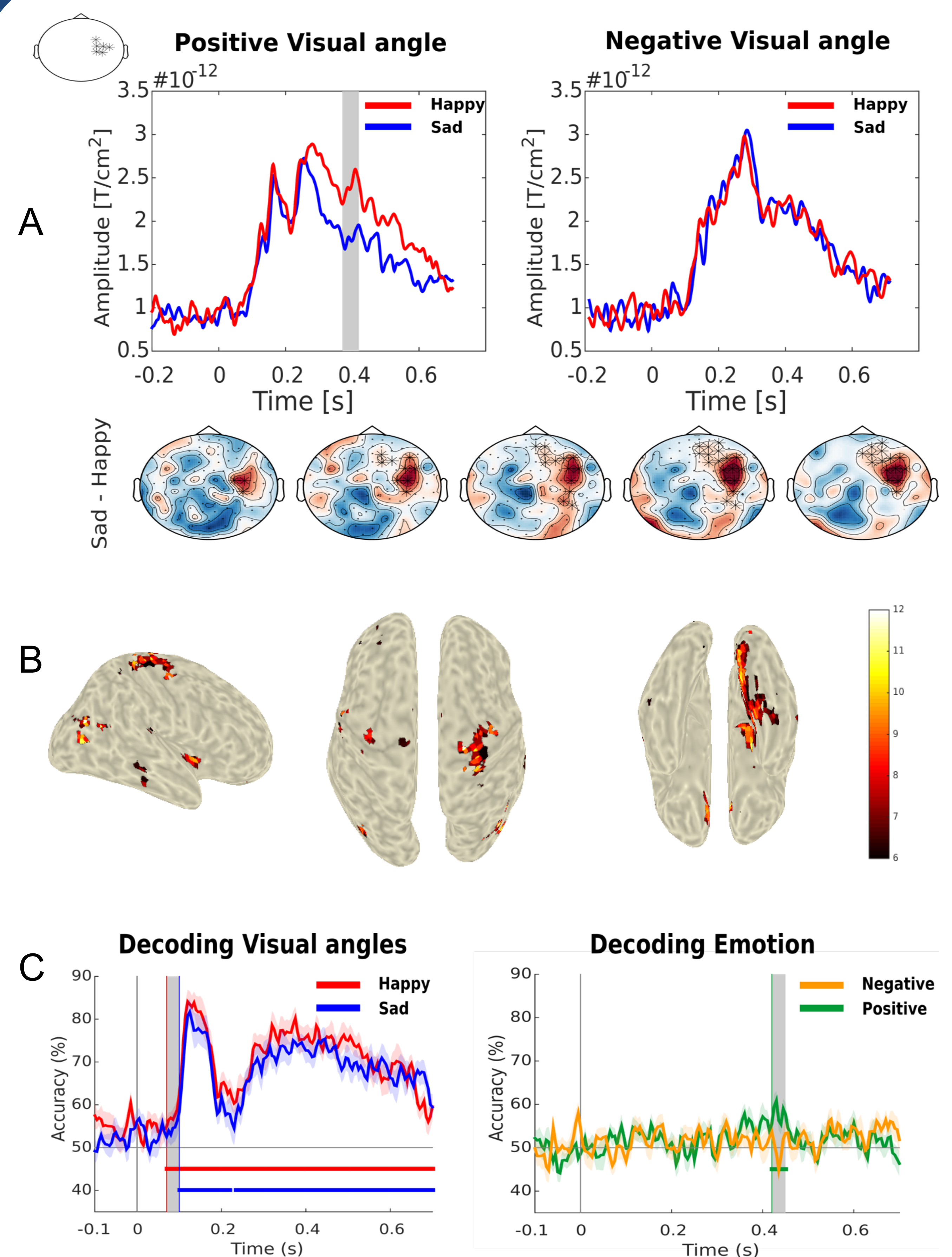


Figure: A) Evoked responses showing difference for emotion processing of positive and negative face angles. B) Source reconstruction of significant differences in evoked responses at positive face angles. C) Time resolved decoding of facial angles and emotion.

## CONCLUSIONS

- We found that the evoked response to happy emotions was significantly less in amplitude (372 - 419 ms after presentation of stimuli) than that for sad emotions only for faces presented at positive visual angles. We did not find significant differences for negative face angles.
- The source reconstruction of these effects reflect the peak activations in the fusiform and lingual gyrus, which are dedicated areas for facial expression of emotion processing.
- Time-resolved Decoding results revealed that while decoding the information about the visual angle, happy emotions (~ 70 ms) are processed faster than sad emotions (~ 100 ms).
- The results suggest that the right face is more expressive than the left. There is also neurological evidence supporting that facial expressions of happy emotions are processed faster than sad.