

# Eye- or mouth lookers?

## Saccade and pupillary responses to diagnostic features of emotional facial expressions

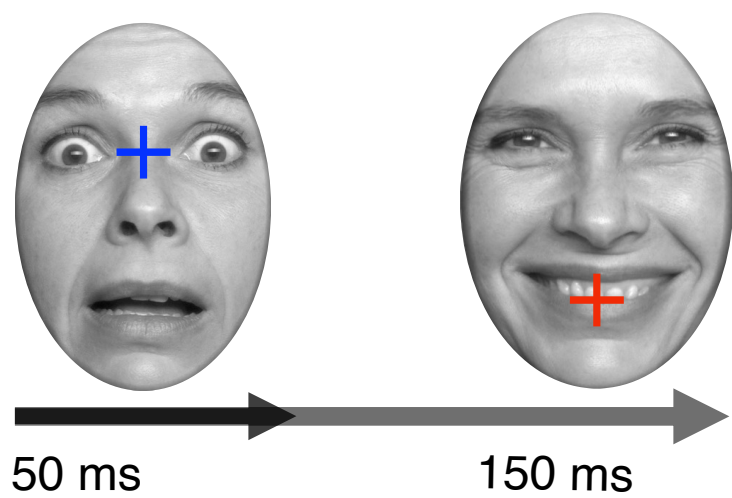
Yu-Fang Yang ([yu-fang.yang@uni-wuerzburg.de](mailto:yu-fang.yang@uni-wuerzburg.de)), Matthias Gamer  
Department of Psychology, University of Würzburg, Würzburg, Germany

### Introduction

The information values of specific facial features differ depending on the emotional expression. The **eyes** are more diagnostic of fear, while the **mouth** area is more relevant for recognizing happy emotions<sup>1</sup>. Previous research has found sensitivity to the distribution of such diagnostic features in reflexive eye movements, but conflicting results have been reported for very brief viewing durations<sup>2</sup>. Under which condition can reflexive eye movements be observed towards diagnostic facial features?

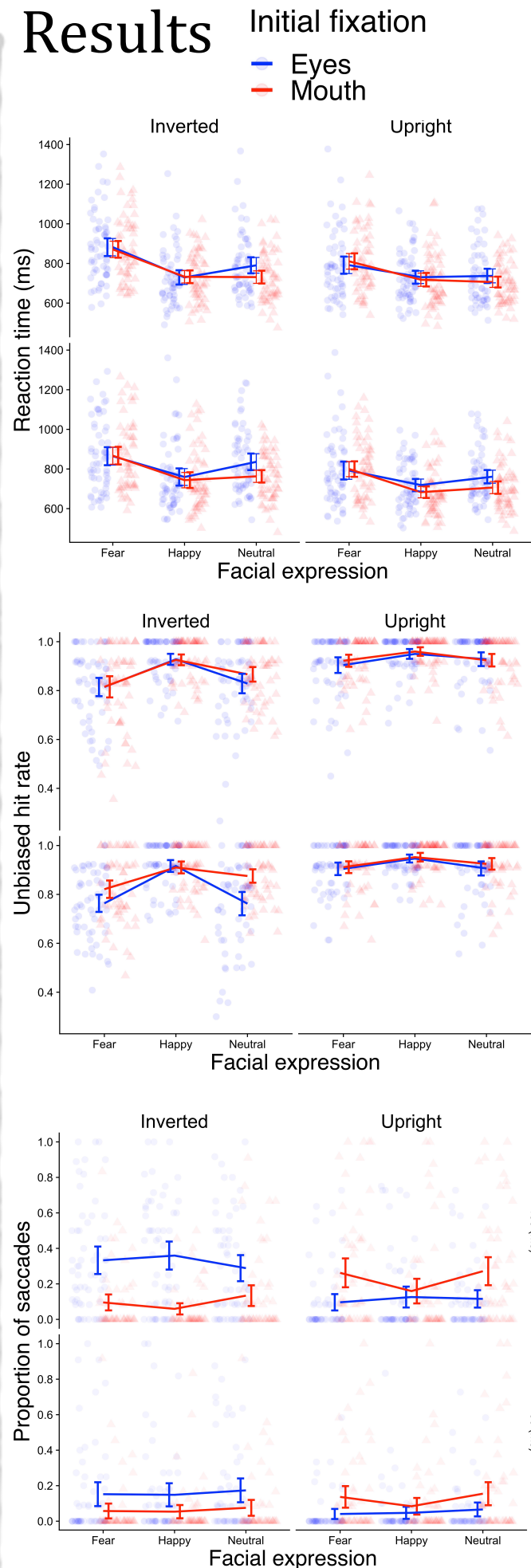


### Method



- **60 participants** with corrected to normal vision.
- A **2 x 2 x 3 x 2** design within within-subject factors presentation time (50ms, 150ms), initial fixation (eyes, mouth), facial expression (fearful, neutral, happy), orientation (upright, inverted) was used.

### Results



DOI: 10.5281/zenodo.4884740

#### Reaction time

Emotion x Initial fixation  
 $F(1,84)= 15,96, p < .001, \eta^2_p = 0.007$ . Faster classification when looking at the happy mouth than fearful eyes.

#### Unbiased Hit rate

Emotion x Initial fixation  
 $F(1,62)= 7,85, p = .002, \eta^2_p = 0.005$ . higher accuracy when looking at the happy mouth than fearful eyes ( $p < .0001$ ).

#### Proportion of saccade

Emotion x Initial fixation  
 $F(1,73)= 18,09, p < .001, \eta^2_p = 0.006$ . There were significantly more saccades towards fearful and neutral eyes than towards happy mouth.

- This pattern even occurred for a presentation time of 50 ms, but vanished for inverted faces. Pupil size was not modulated by the experimental manipulations.

### Conclusion

Classification of facial expressions was generally very accurate and fast, the initial focus on diagnostic features had no clear effect on performance. However, we replicate the previously observed preferential visual orienting towards diagnostic features even for very brief presentation times. These findings demonstrate that facial expression categorization can be accomplished with very restricted visual input.

1.Scheller, E., Büchel, C., & Gamer, M. (2012). *PLoS one*, 7(7), e41792.

2.Atkinson, A. P., & Smithson, H. E. (2020). *Journal of experimental psychology: Human perception and performance*, 46(3), 292.