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Eyes Wide Shut: The Impact of Eye Visibility on Facial Emotional Recognition

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Introduction

Several studies have highlighted how specific regions of the face, particularly the eyes, are essential for decoding emotions. For instance, **anger** and **fear** are primarily recognised from the eyes region, whereas **happiness** is more recognisable from the mouth region (Calvo et al., 2018).

This suggests that occlusion of the eyes might impair the ability to recognise emotional faces.

However, it raises the question: Does the manner of occlusion of the eyes equally influence the recognition of emotional facial expressions?

Method



50 bachelor students ($M = 22.82$; $SD = 4.00$; 39 women/11 men) saw 240 faces varying in emotional expression and eye visibility.



Emotions: **anger**, **fear**, **happiness** and neutral.
Eye visibility: open, closed and glasses.



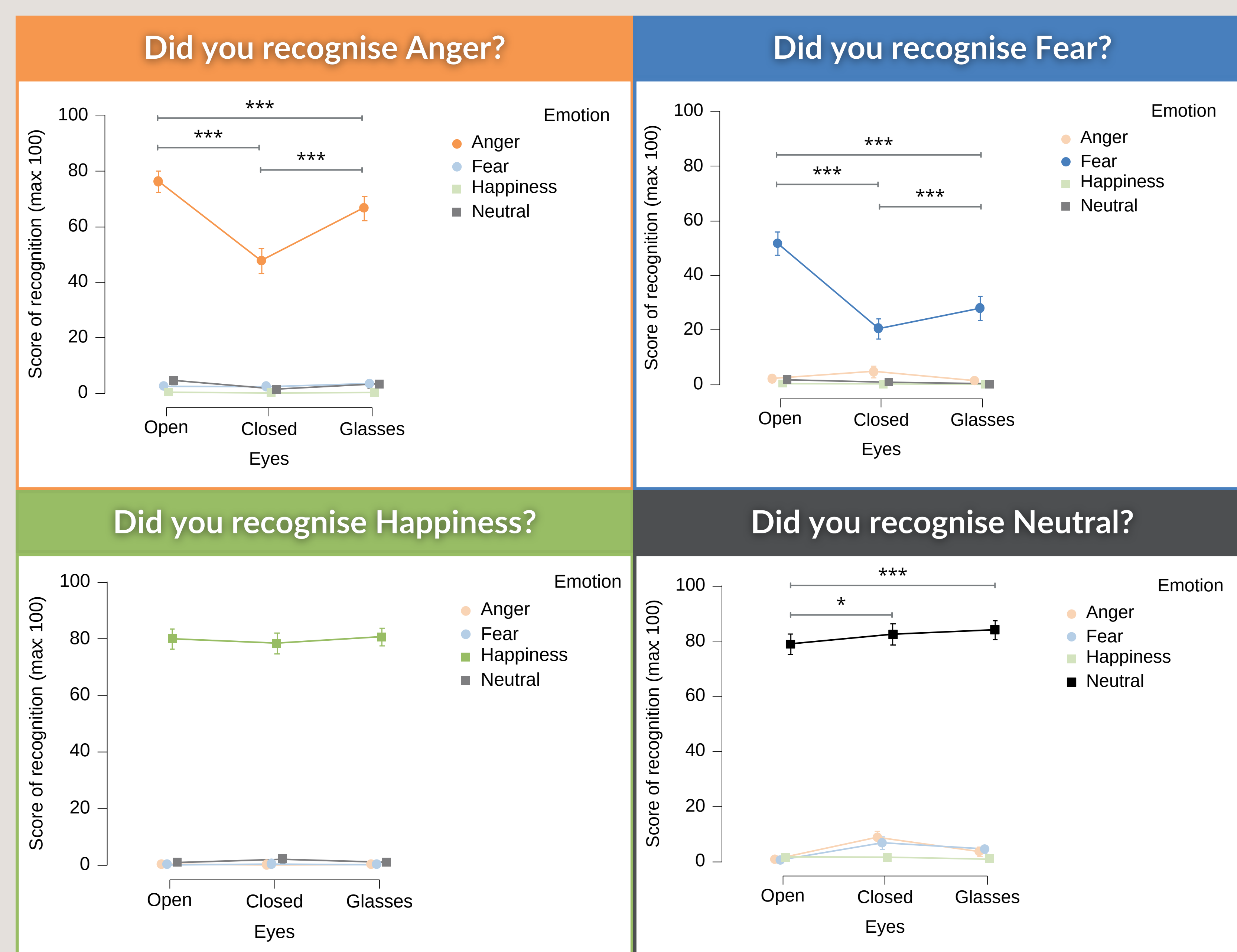
Participants rated how much they recognised **anger**, **fear**, **happiness**, **desire**, disgust, surprise and neutral on each face from 0 to 100, providing an evaluation for each emotion.



Pilot results

Focusing on **congruent** measures (i.e., ratings matching the expressed emotion), we conducted a rmANOVA on recognition scores for **anger**, **fear**, **happiness** and neutral facial expressions.

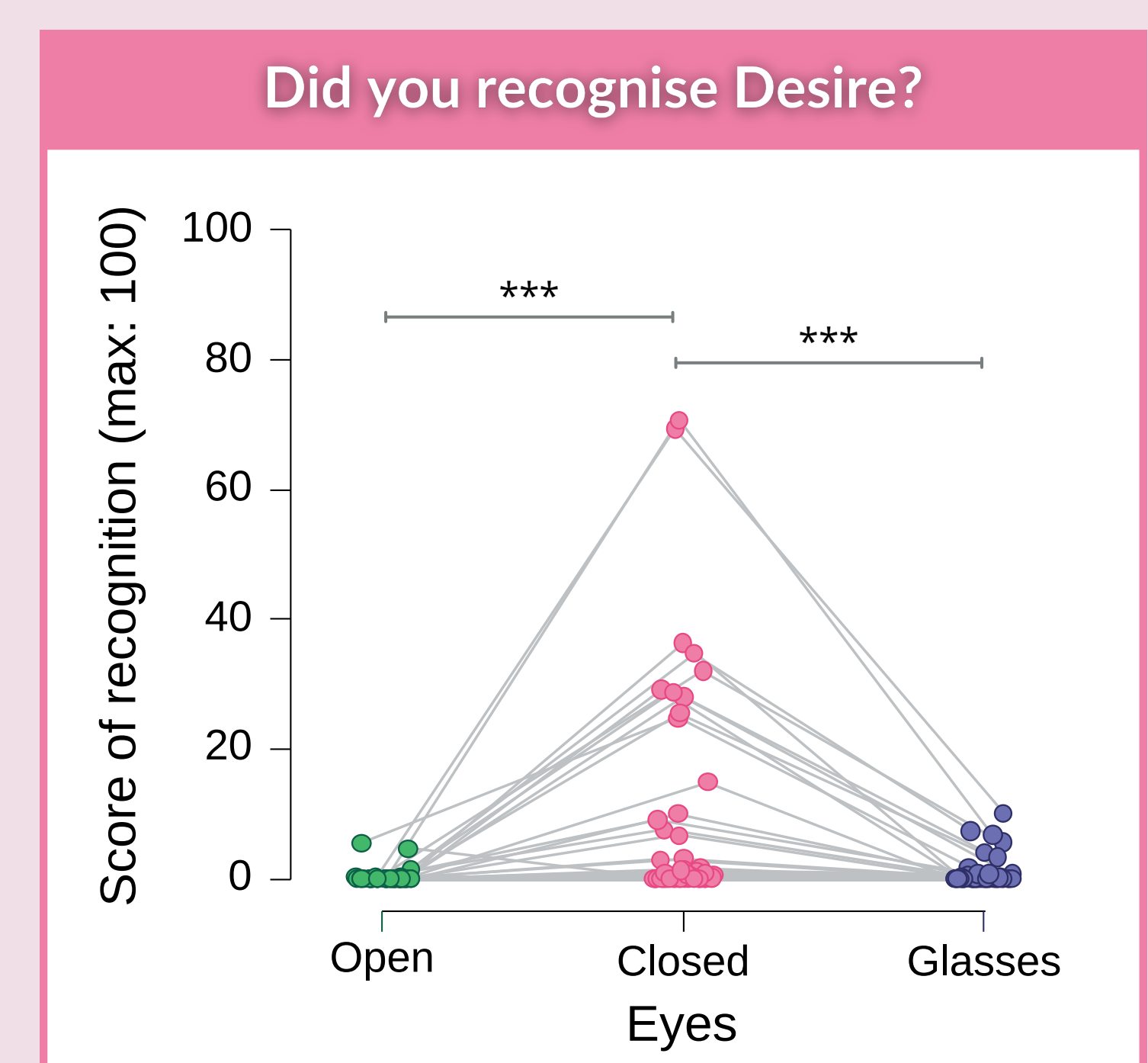
All levels of the 4x3x4 rmANOVA were highly significant, considering emotional expressions, eye visibility and response emotions.



Note. Scores of recognition of response emotions by emotional facial expression and eye visibility condition. Error bars correspond to 95% within-participants confidence intervals. For the congruent emotions, asterisks indicate the significant differences between conditions with Holm-Bonferroni corrections: * $p < .05$; *** $p < .001$.

Supplementary results

Participants from a previous study have reported informally that they perceived **fearful faces with closed eyes** as expressing orgasms. To address this insight, we analysed the scores on the **desire** scale for **fear** expressions with eye visibility as factor.



Note. Asterisks indicate the significant differences between conditions: *** $p < .001$.

Discussion

Occluding the eyes significantly impairs our ability to recognise emotions where the eyes are crucial, such as **anger** and **fear**.

We propose that seeing an emotional face with closed eyes suggests that the attentional focus of the elicited emotion is internal, impairing the expected emotional recognition, while the ambiguity provoked by the glasses might be an in-between.

Piloted qualitative data seem to concur, with more internally focused emotions being reported for closed eyes (e.g., concentration, calm, sadness) than for glasses, which remain similar to open eyes. This is particularly noticeable with closed-eyes **fear**, where the expression is often attributed to **desire**.

Future research will use eye-tracking to explore the observer's gaze patterns, specifically examining whether they spend equal amounts of time looking at the eye region. This may help explain some of the variability in recognizing emotions.

Reference

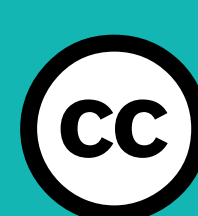
Calvo, M. G., Fernández-Martín, A., Gutiérrez-García, A., & Lundqvist, D. (2018). Selective eye fixations on diagnostic face regions of dynamic emotional expressions: KDEF-dyn database. *Scientific Reports*, 8(1), 17039. <https://doi.org/gh3j6n>

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