



Eye preferences in response to emotional stimuli in captive capuchin monkeys (*Sapajus apella*)



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Introduction

Eye preferences may provide a window into emotional responses in animals. Emotions are important for predicting behaviour and assessing welfare.

Why use eye preferences?

The 'Valence hypothesis' proposes that the **right hemisphere** is dominant for **negative** emotional processing, and the **left hemisphere** is dominant for **positive** emotional processing (Davidson 1995).

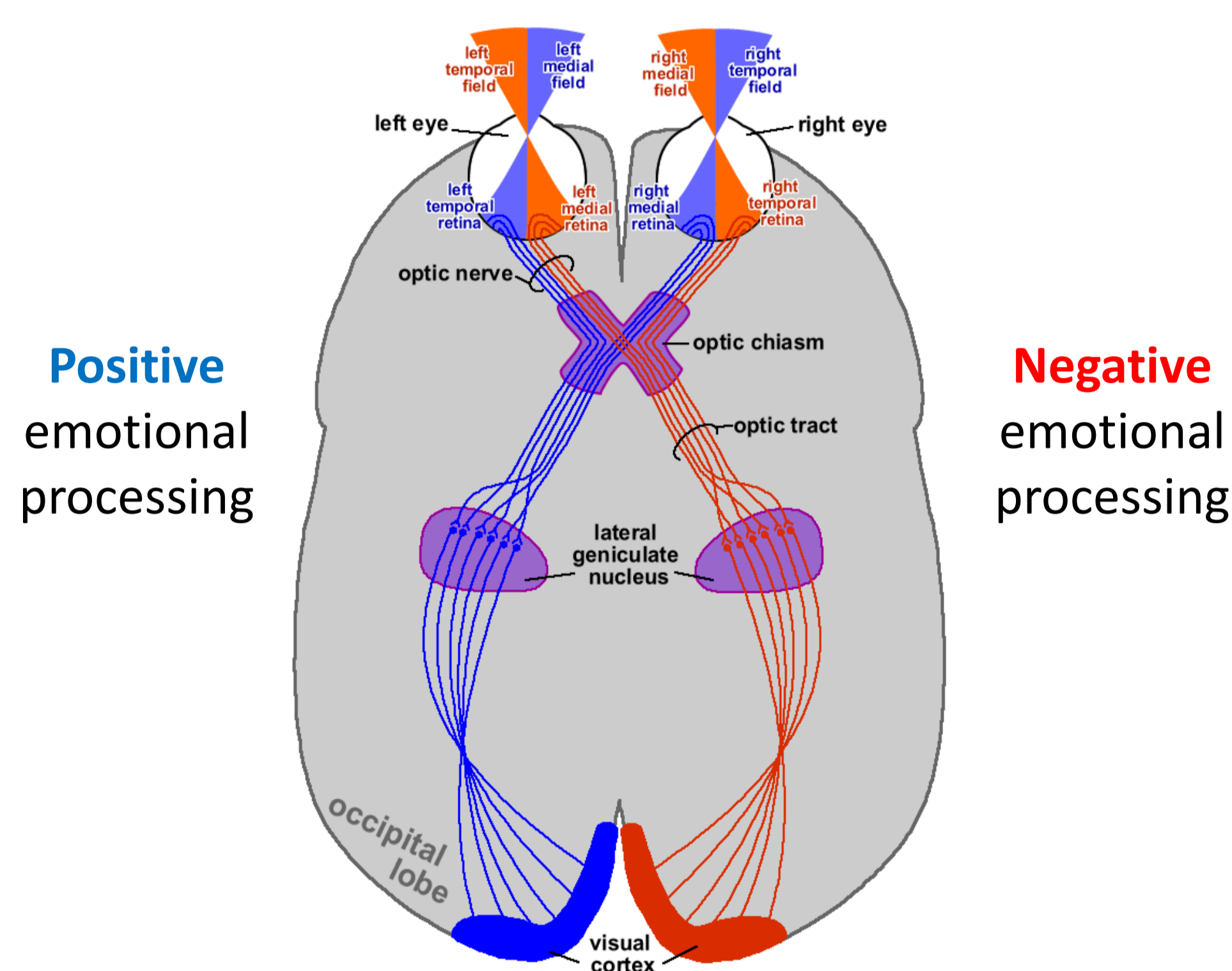


Fig 1. Human brain and optic chiasm

Hemispheric specialisations are thought to be reflected in the opposite side of the body in preferences for movement (e.g. limb preferences) and perception (e.g. eye preferences) (Rogers et al. 2013).

Objectives

To examine whether capuchin monkey eye preferences were modulated by the emotional valence of visual stimuli. In particular, whether the pattern of eye preference was consistent with the Valence hypothesis.



Hypothesis: Greater **left eye use** (right hemisphere dominance) for looking at **negatively valenced** images. Greater **right eye use** (left hemisphere dominance) for looking at **positively valenced** images.

Materials and Methods

Subjects: Eleven captive brown capuchin monkeys at Edinburgh Zoo.



Stimuli: Four images of different emotional valence and social relevance. Monkey faces were categorised as socially relevant.



Fig 2. Positively valenced images (left) and negatively valenced images (right)



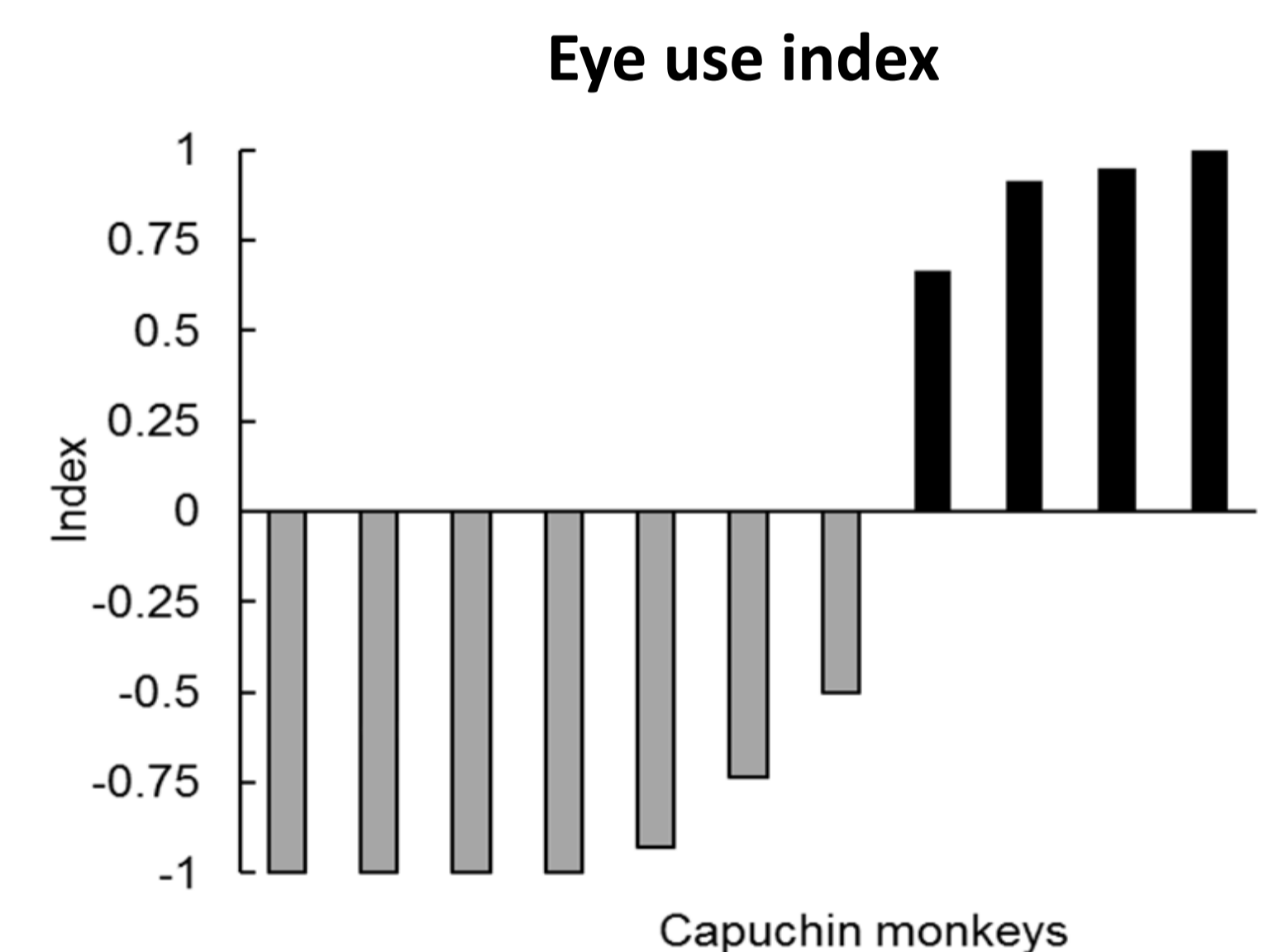
Fig 3. Capuchin monkey looking into viewing hole

Procedure: Within-subjects design (22 hours of research sessions). During each two-hour session several monkeys were individually presented with all four images (30s presentation of each image) on a screen.

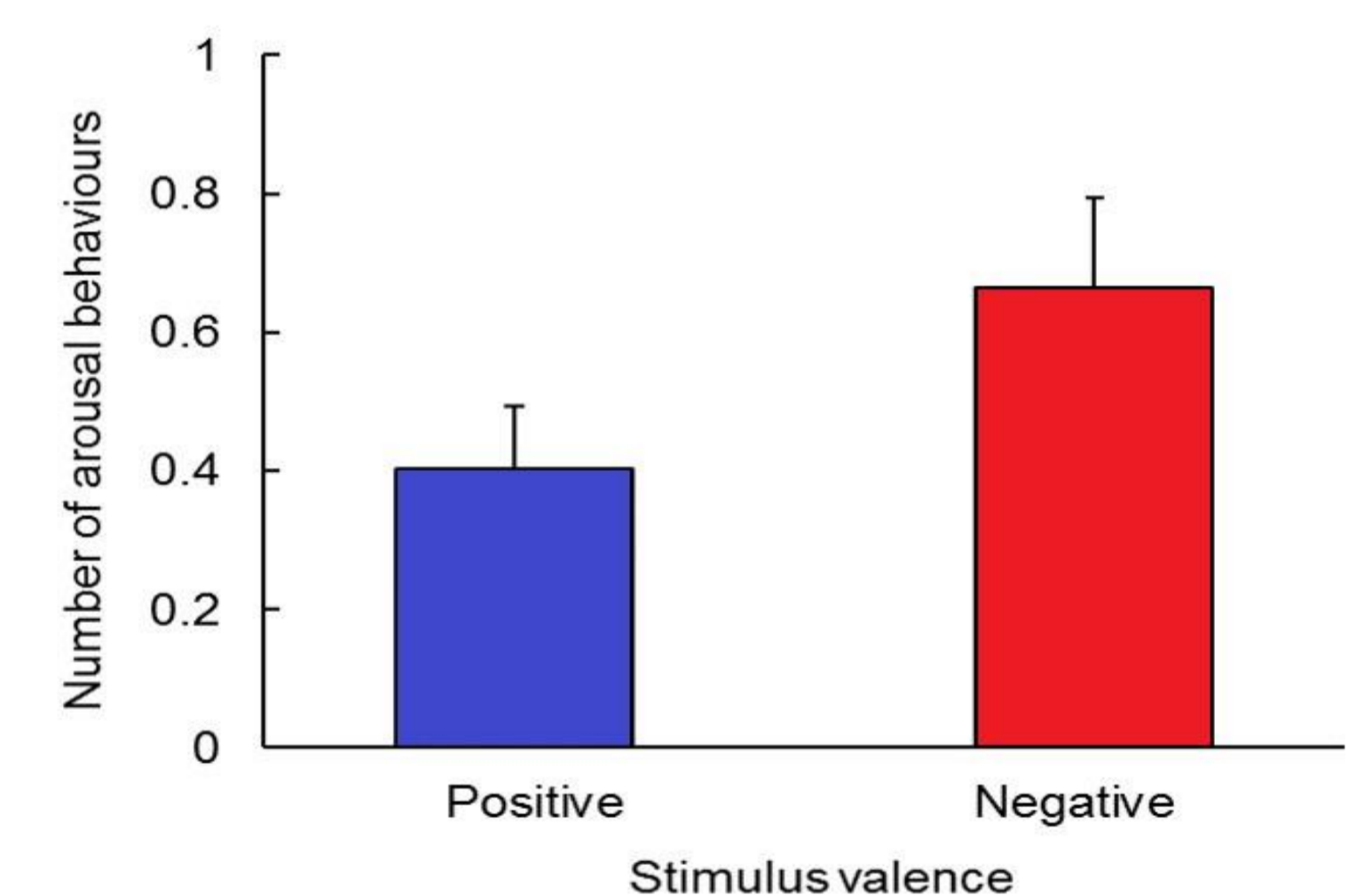
Eye preferences (number of left and right eye looks) and **arousal behaviours** (vocalisation, door-touching, self-scratching and hand-rubbing) for viewing the images through a single viewing hole were recorded.

Results

- **Individual-level eye preferences;** seven monkeys were left eye biased and four monkeys were right eye biased for viewing all the images (binomial tests, $p_s < 0.05$ for all).
- **Eye preferences did not differ with the emotional valence of the images** ($t_{(10)} = 1.27$, $p = 0.23$). No support for Valence hypothesis.
- **More arousal behaviours for viewing the negatively valenced than positively valenced images** ($M = 0.66$ ($SEM = 0.13$) vs. $M = 0.40$ ($SEM = 0.09$) behaviours per session), $F_{(1, 10)} = 5.74$, $p = 0.04$. Suggests stimuli had a degree of emotional salience.



Mean number of arousal behaviours per session



Discussion and Conclusions

Individual-level eye preferences may reflect the sighting-dominant eye (the eye used for monocular viewing tasks) and the constraint of the monocular viewing task itself (Mapp et al. 2003). We found **no evidence for hemispheric specialisation of emotional processing, and no relationship between eye preferences and hemispheric processing**, in capuchin monkeys. A better approach may be to examine visual field use.

Key references

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Further information

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