INFLUENCE OF SYMMETRY ON FACE DETECTION

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INTRODUCTION

- Symmetry and faces are highly salient in visual processing and ethologically significant (Chen et al., 2007; Kanwisher et al., 1997; Norcia et al., 2002; Saunders & Knill, 2001).
- Processing of symmetry and face perception interacts. Photographs of symmetric faces are preferred and perceived as more attractive compared to less symmetric faces (Perrett et al., 1999; Rhodes et al., 1998). Symmetry detection is enhanced for upright, normal faces compared to inverted, contrast-reversed faces (Rhodes et al., 2005).
- In previous studies, symmetry and face-likeness were not manipulated as independent variables. When stimuli were constructed in a manner that allowed symmetry and face-likeness to be varied independently, symmetry detection was enhanced for face-like images and there was no inversion effect (Conte et al., SFN2006). So therefore we ask...

METHODS

Participants:
- 6 R-handed females, avg. age 25 yrs, corrected to normal visual acuity; 2 were raters of face-likeness

Procedure:
- ~ 500 practice trials
- 2800 experimental trials/participant

Variables:
- Symmetry (0.2 - 0.6, 0.6 - 0.8, 0.8 - 1.0)
- Face Ratings (1.41-1.67, 1.67-1.97, 1.97-2.36, 2.36-4.0)
- Presentation Time (100 or 400 ms)
- Orientation (upright or inverted)

“Choose the image that is most face-like”

Rating the Images - 10 participants (5M, 5F) rated over 11,000 images as face-like on a 4-point scale (1 = least to 4 = most face-like). The overall ratings were derived from the 1st factor of missing-data principle component analysis. Each participant’s ratings strongly correlated with the consensus rating.

STIMULI DESIGN

Symmetry was quantified by mixing different proportions of check pairs. 12.5% of the stimuli were one group of checks, 39.4% another, 50% a mixture of both. Symmetry was manipulated by mixing different proportions of check pairs.

RESULTS

Fraction Correct

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<td>100 ms upright</td>
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Statistical analysis: ANOVA

Main Effects | F   | p    |
-------------|-----|------|
Symmetry     | 28.941 | < 0.001 |
Face Rating  | 236.29 | < 0.001 |
Time         | 18.566 | < 0.001 |
Orientation  | 0.058  | > 0.05 |

Interactions | Symmetry * Time | 3.682 | < 0.025 |
|              | Symmetry * Face Rating | 4.633 | < 0.001 |
|              | Face Rating * Time | 8.047 | < 0.001 |
|              | Face Rating * Time * Symmetry | 5.203 | < 0.001 |

Post-Hoc Analyses
- Errors were not systematic. They occurred equally in all conditions.
- There were no differences in accuracy for participants who rated more than 2 times.

REFERENCES


CONCLUSION

When symmetry and face-likeness are manipulated as independent variables, symmetry interferes with discrimination of face-like from non-face-like images at the featural (parts-based) level, and has no effect at the configurual (holistic) level.

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