Theoretical context

- Numerous studies support the critical role of horizontal spatial information in upright face identification. Recently, it was shown that the best face recognizers are more selectively tuned to horizontal information ^{1, 2} and the well-known face inversion effect induces a clear reduction in horizontal tuning for upright faces³.
- In the present study, we compared spatial orientation tuning for samerace (SR/White-European) and other-race (OR/ East-Asian) faces.

Method

- 15 caucasian participants,
- 18-35 years old (M=22, SD=2.3).

Learning phase

- 5-AFC face identification task with SR and OR blocks couterbalanced,
- stimulus duration was 1000 ms,
- learning phase was completed when accuracy $\geq 90\%$ for both conditions.

Experiment

- 5-AFC face identification task with orientation bubbles (see Figure 1)⁴,
- 1500 trials per race (30 blocks/race).





Horizontal tuning for same-race and other-race faces

Isabelle Charbonneau¹, Kim Calvé¹, Justin Duncan^{1,2}, Caroline Blais ¹ & Daniel Fiset¹ (1) Département de Psychologie, U. Québec en Outaouais (2) Université de Fribourg



Figure 1. Orientation bubbles method. The orientation content of a stimulus is randomly sampled on a trial-by trial basis by submitting a base stimulus a) to a Fourier transform b) and then multiplying it with the orientation bubbles mask d) created with the help of a random vector c). The result is then converted to the image domain with inverse FFT (e) and presented to the participant.

Analyses and results

• Orientation bubbles data were analyzed 20 with a classification image analysis^{5, 6}:We calculated a weighted sum of orientation positive/negative allocating filters, weights (z-scored accuracies) to filters that led to correct/incorrect responses, 10 respectively;

Classification vectors were standardized using the mean and standard deviation of the null hypothesis⁴, summed to create a single group vector (divided by \sqrt{N}), and submitted to a pixel test⁷, Zcrit= 2.1, p < 1.05 (two-tailed), corrected for multiple observations.

Overall, successful recognition of both associated with horizontal races was orientation information. However, this link was stronger for SR faces, compared to OR faces.

Conclusion

These results reinforce the crucial role of horizontal facial contour in face recognition with same-race faces and also raise the possibility that these lowlevel visual information could account for the advantage of same-race faces to be better remembered than other-race faces (i.e. other-race effect⁸). In order to investigate this possibility, we are currently collecting data with Asian participants.



Figure 2. Spatial orientations correlated with accuracy for SR faces (max = 18.33) and OR faces (max = 9.57). The difference between the two conditions is shown in black (max = 6.2).



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