

Does drawing faces make you a super-expert of faces?

An investigation of face perception and recognition abilities in visual artists

Christel Devue, Catherine Barsics & Serge Brédart



Background

Face processing abilities would range from very poor (i.e. developmental prosopagnosia) to outstanding performance (i.e. super-recognizers)¹. Highly physiognomist people seem to show a larger face inversion effect compared to controls, suggesting a link between face recognition skills and the amplitude of the effect. Through the practice of portraiture and the close attention paid to the shape of the head, the facial features and their configuration to reach a good likeness of a person, artists might perform like « super-recognizers ».

Aim

Investigate whether the regular practice of portraiture leads to specific better performance in face processing (perception and memory) and whether the expertise acquired through drawing qualitatively affects the processing of faces (i.e. as indexed by a differential inversion effect).

Methods

Participants

- N = 21; 11 artists (M = 26 years ± 4), 10 controls (M = 26 years ± 3)
- Artists drew portraits for 8,5 years ± 5
- They devoted 62% ± 23 of their practice to faces and 33% ± 18 to portraits/caricatures

Measures and tasks

- **Self-reported face processing abilities questionnaire**
37 items, 7-point Likert scale (e. g. "I recognize people I have only encountered once at first sight")
- **Cambridge Face Perception Test²**
Arrange 6 faces according to their degrees of likeness to a target
- **Cambridge Face Memory Test – Australian³**
Retrieve 1 out of 6 studied targets among 3 more and more degraded faces

Perceptual matching of Houses vs. Faces (Upright/inverted)

Image 1 (1000 ms) → Mask (750 ms) → Image 2 (till response)

Houses

"Same" pair (36 trials)

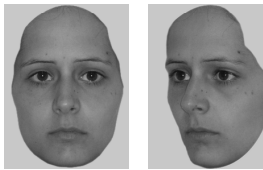


"Different" pair (36 trials)

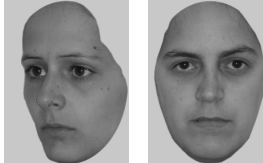


Faces

"Same" pair (36 trials)



"Different" pair (36 trials)

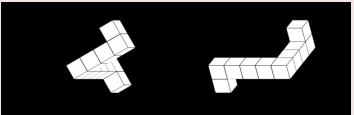


Mental rotation

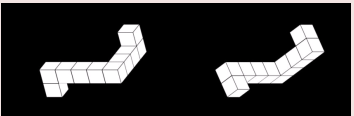
Same – different judgment on pseudo 3D figures⁴ presented side by side

- Rotation on the X (50 trials) or on the Z axis (50 trials)
- 5 angles (0, 45, 90, 135 and 180°)

"Same" pair



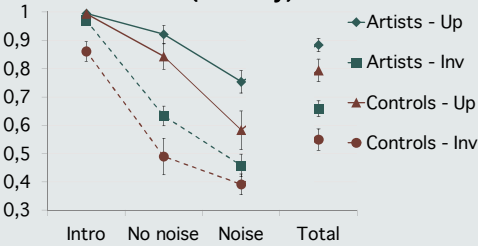
"Different" pair



Results & Discussion

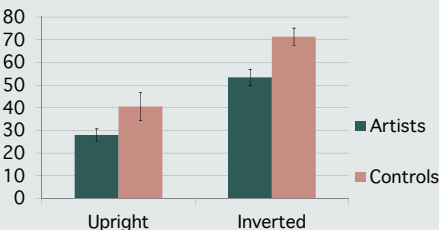
Face processing questionnaire: Artists reported better face recognition abilities (M = 204) than controls (M = 159); Mann-Whitney U test, z = 3, p < 0.005.

CFMT – Australian (accuracy)



- 2 Group X 2 Difficulty (No noise, Noise) X 2 Orientation
- Main effects of Group (**artists > controls**), Difficulty and Orientation, all ps < 0.05 (no interactions)

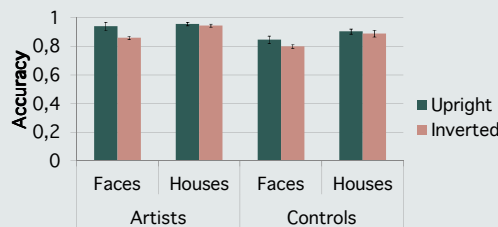
CFPT – Mean total deviation



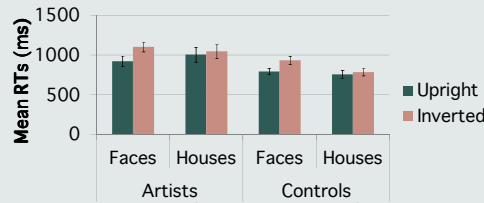
- 2 Group X 2 Orientation
- Main effects of Group (**artists > controls**) and Orientation, both ps < 0.01 (no interaction)
- Similar inversion effect in the two groups ((upright - inverted)/upright): -1.1 ± 0.75 vs -0.95 ± 0.63

Artists have better perceptual and recognition abilities for faces than controls

Perceptual matching task



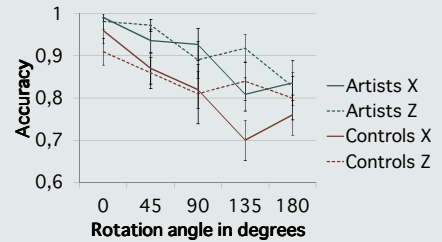
- 2 Group X 2 Category X 2 Orientation
- Main effects of Group (**artists > controls**), Category (houses > faces) and Orientation (upright > inverted), all ps < 0.001
- Category X Orientation interaction (**inversion effect only for faces**)



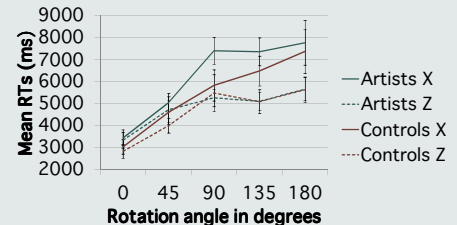
- Main effects of Group (**artists > controls**) and Orientation (upright < inverted), all ps < 0.05
- Category by Orientation interaction (**inversion effect only for faces**), Group X Category interaction (controls faster with houses than with faces)

Artists are overall more accurate but slower than controls; they do not show an ampler face inversion effect

Mental rotation task



- 2 Group X 2 Axis X 5 Rotation angle
- Main effects of Group (**artists > controls**), and angle, all ps < 0.05
- Axis X angle interaction, p < 0.002



- Main effects of axis (X > Z), and angle, all ps < 0.001
- Axis by angle interaction, p < 0.002

Similar processing time for artists and controls but artists are more accurate

Conclusion

Artists who draw portraits on a regular basis report better face recognition abilities. They also show better face perception skills as well as better perceptual skills in general (see 5) in terms of accuracy, which sometimes relied on longer processing times (see perceptual matching task). These better perceptual abilities extend to better face recognition abilities.

The absence of differential inversion effect in artists might indicate a quantitatively but not qualitatively different facial processing due to expertise in this group compared to controls.

References

1. Russell et al. (2009). Super-recognizers: People with extraordinary face recognition ability. *Psychonomic Bulletin & Review*, 16, 252-257.
2. Duchaine et al. (2007). Family resemblance: Ten family members with prosopagnosia and within-class object agnosia. *Cognitive Neuropsychology*, 24, 419-430.
3. McKone et al. (2011). Face ethnicity and measurement reliability affect face recognition performance in developmental prosopagnosia: Evidence from the Cambridge Face Memory Test–Australian. *Cognitive Neuropsychology*, 28, 109-146.
4. Peters & Battista (2008). Applications of mental rotation figures of the Shepard and Metzler type and description of a Mental Rotation Stimulus Library. *Brain and Cognition*, 66, 260-264.
5. Kozbelt (2001). Artists as experts in visual cognition. *Visual Cognition*, 8, 705-23.

Contact information: cdevue@ulg.ac.be