2D-3D
Kin recognition in human faces

Tommaso Querci, Iris J. Holzleitner, Lisa M. DeBruine

Department of Neuroscience and Psychology, 56-58 Hillhead st, University of Glasgow, UK

Registered for Preregistration Challenge

Introduction

- Kin recognition plays a significant role in human social behaviour, affecting trustworthiness, cooperation, and partner choice[1][2].
- Allocentric (third-party) kin recognition abilities are supposed to serve humans and other primates as a group-recognizing feature[3].
- Maloney and Dal Martello[4] showed that humans can discriminate between photographs of biological siblings and unrelated couples.

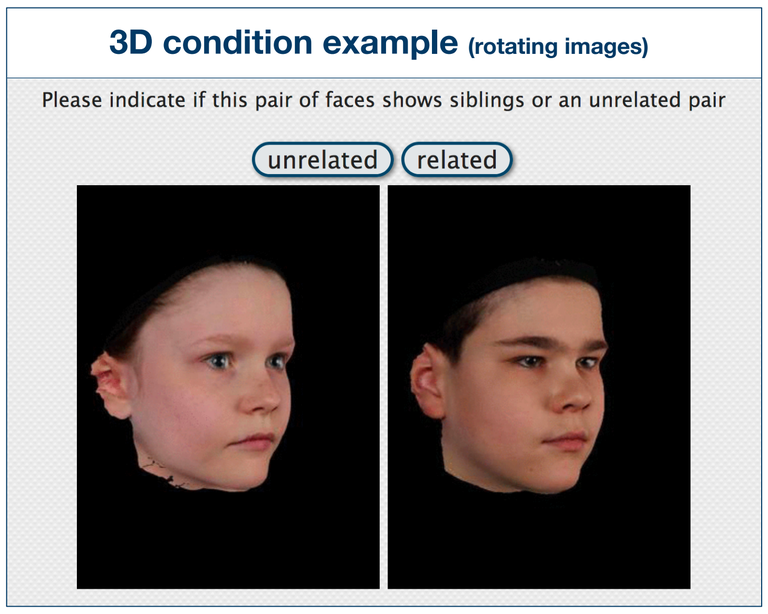

Fig. 1

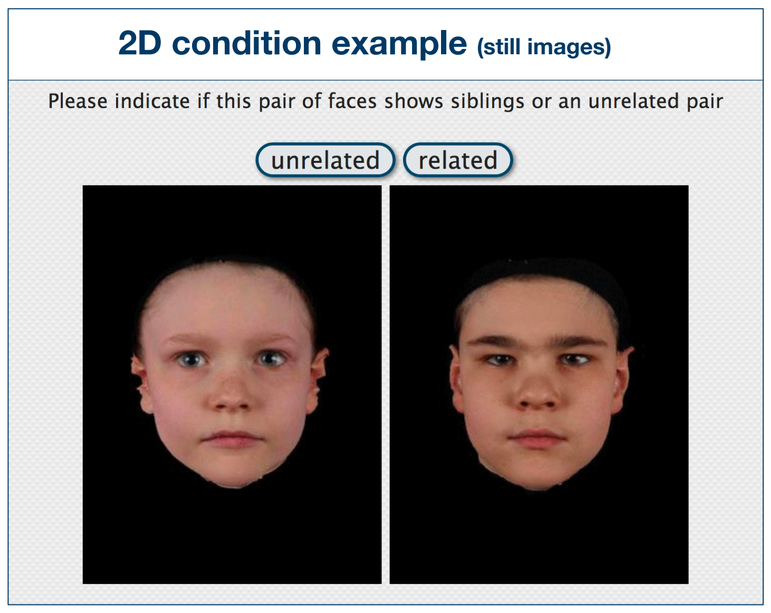

Fig. 2

Aims

- Since 3D visualization produces an experience more similar to real life, which could result in a more accurate perception, the present study compares third-party kinship judgments using 2D and 3D face stimuli.
- Also, following Maloney & Dal Martello (2006), we test whether third-party kinship judgments are affected by age and sex differences between children.

OPEN MATERIALS PREREGISTERED

Methods

- From an overall set of approximately 1500 images, we selected 50 sibling pairs (both siblings under the age of 18) and 50 foil pairs matched for age, sex, and ethnicity.
- Pairs of faces were presented on a black background, masked to show only the face, the ears, and a portion of the neck. 3D faces were animated to move side-to-side (-40 to +40 degree). (Fig. 1-2)
- 55 raters (32♀ 23♂) judged kinship of 50 2D face pairs and a different 50 3D face pairs (for each condition 25 related, 25 unrelated).

Results

- **Main effect of relatedness:** siblings were judged as related more often than foil pairs. No significant effects of sex and age difference within the couple. (Fig. 3)
- **Main effect of stimulus type:** pairs presented in 3D were judged as related more often than 2D pairs, independent of the actual relatedness. (Fig. 4)
- **Effect of age difference on stimulus type:** in the 3D condition, the bigger the age difference within the couple, the more likely for that couple to be judged as related. This effect does not appear in the 2D condition. (Fig. 5)

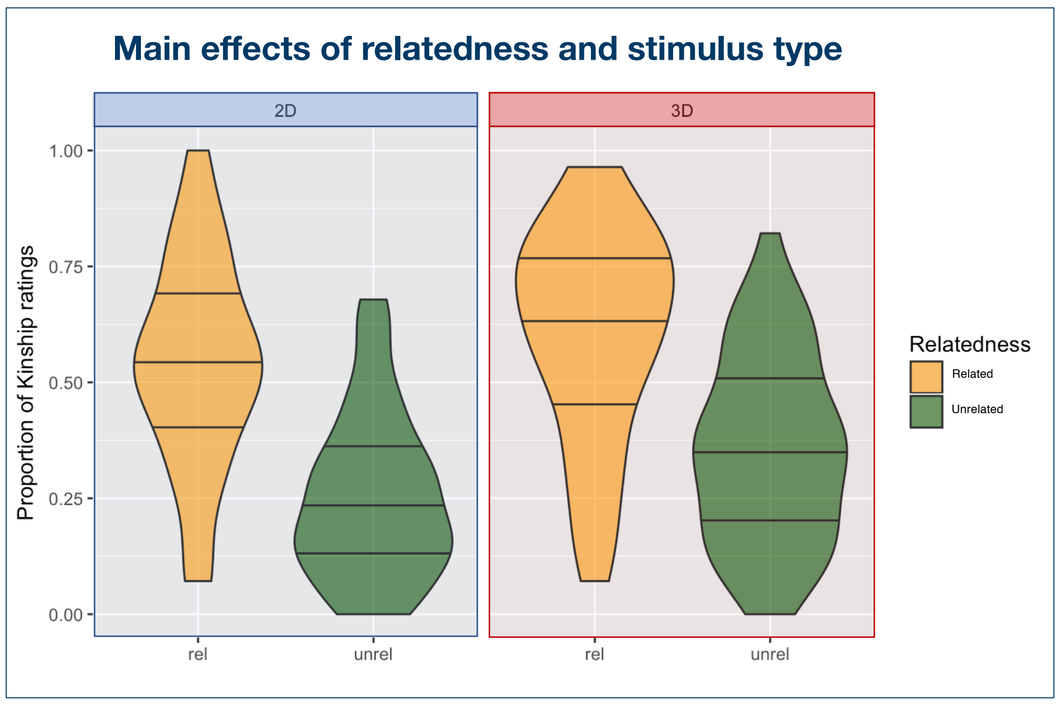

Fig. 3

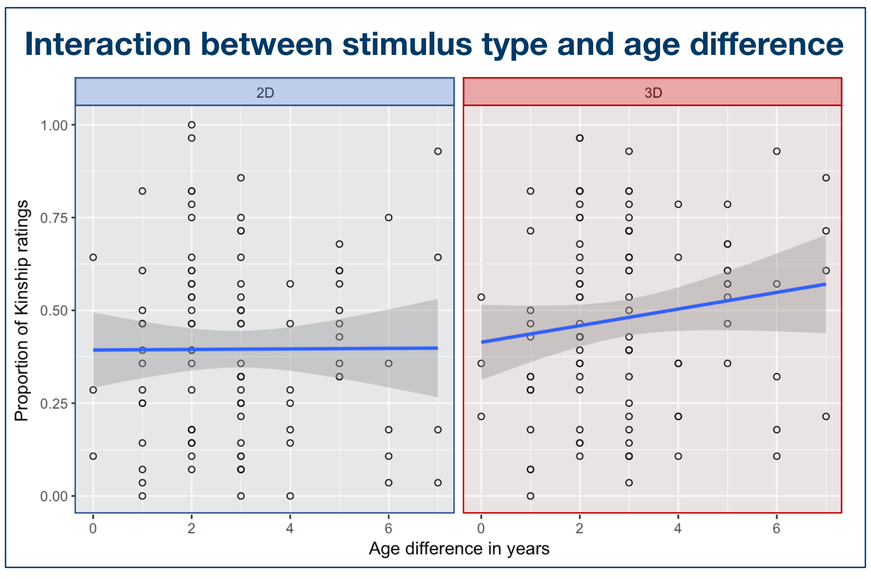

Fig. 5

Conclusions

- 3D visualization does not improve judgements' accuracy, but it does increase the perceived relatedness overall.
- Unexpectedly, and only in the 3D condition, third-party raters are more likely to judge a pair as related the bigger that pair's age difference is.
- Further research should investigate whether the stim-type effect is caused by a more attentive exploration of 3D faces. Also, it is to explore the interaction between 3D visualization and age difference.

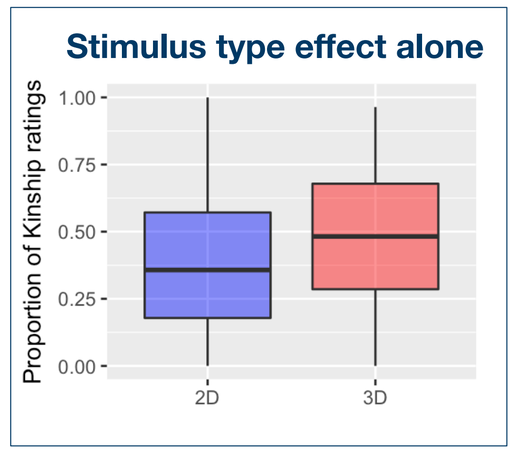

Fig. 4

References

[1] DeBruine, L. M. (2005). Trustworthy but not lust-worthy: Context-specific effects of facial resemblance. *Proceedings of the Royal Society of London B: Biological Sciences,* 272(1566), 919-922.

[2] Krupp, D. B., DeBruine, L. M., & Barclay, P. (2008). A cue of kinship promotes cooperation for the public good. *Evolution and Human Behavior,* 29(1), 49-55.

[3] Cheney, D. L., & Seyfarth, R. M. (1986). The recognition of social alliances by vervet monkeys. *Animal Behaviour,* 34(6), 1722-1731.

[4] Maloney, L. T., & Dal Martello, M. F. (2006). Kin recognition and the perceived facial similarity of children. *Journal of Vision*, 6(10), 4-4.

Acknowledgements

The authors thank the members of the FaceLab at the University of Glasgow, Erasmus+ program for funding the internship, Peter Kramer for supervision and suggestions.
Special thanks to Simone Garuglieri and Valeria Taddei for help and revision.