

Personal familiarity enhances sensitivity to horizontal structure during face identification

Introduction

Selective processing of horizontal structure is correlated with face identification performance and the magnitude of the face inversion effect (Pachai et al., 2013).

Personal familiarity robustly enhances face recognition performance (e.g. Burton et al., 1999; Ramon et al., 2011).

Questions: Does personal familiarity selectively enhance the processing of horizontal structure? To what extent will this effect interact with face orientation?

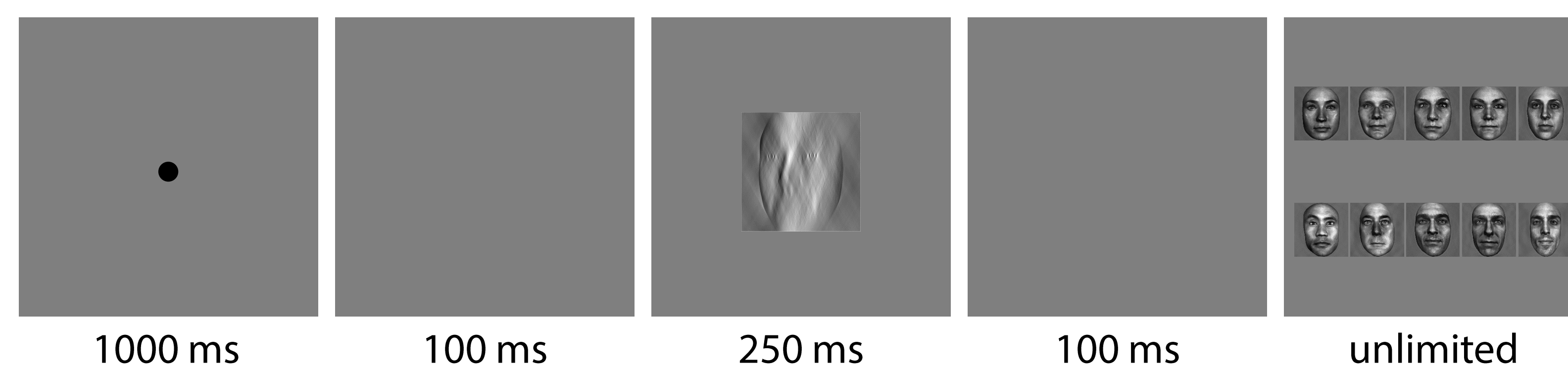
Methods

Stimuli: 20 members of the Institute of Neuroscience and School of Psychology at University of Glasgow.

Familiar observers: From University of Glasgow (n=18)

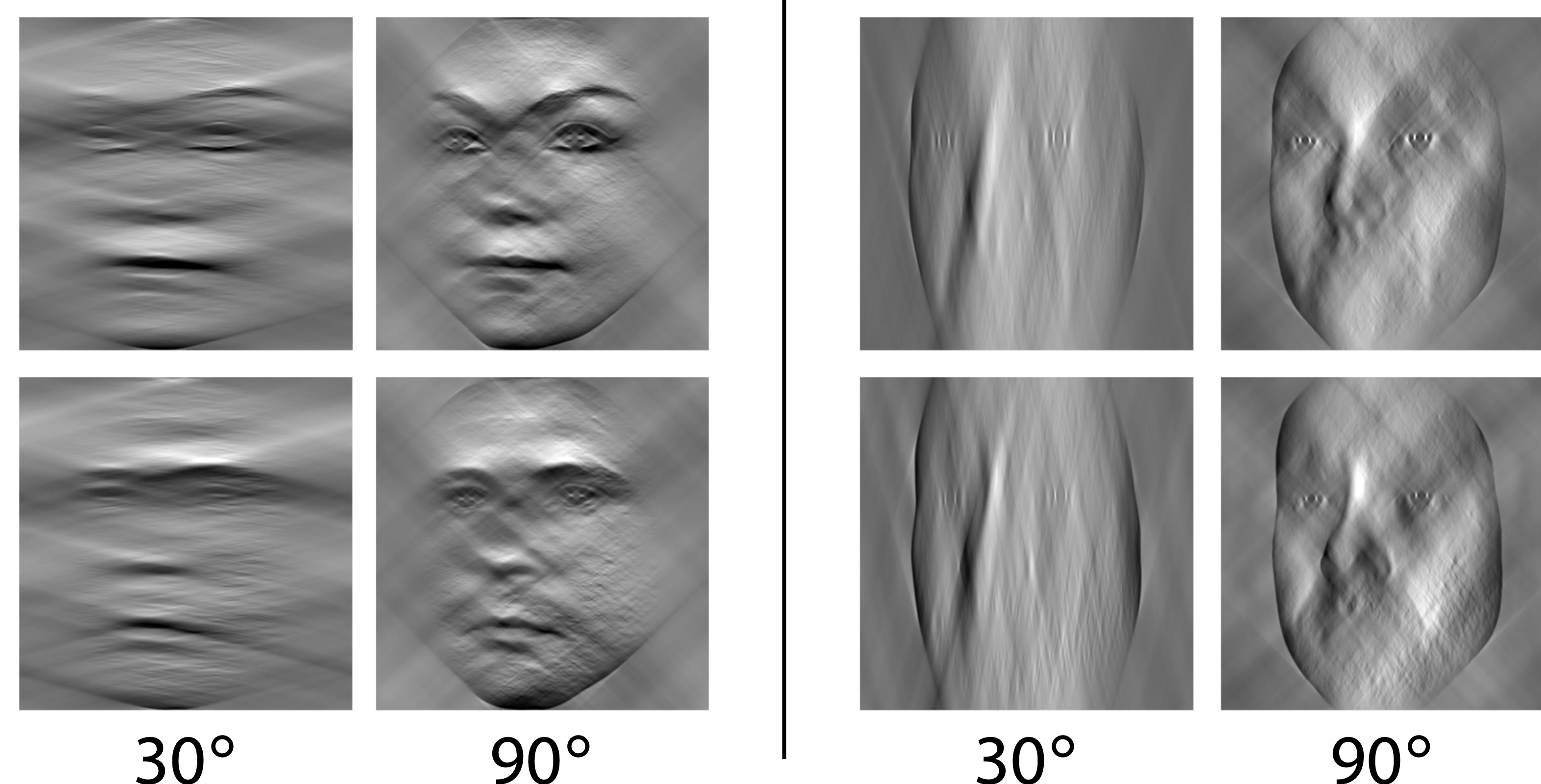
Unfamiliar observers: From McMaster University (n=18)

Task: 10-AFC, upright or inverted, with variable viewpoint.



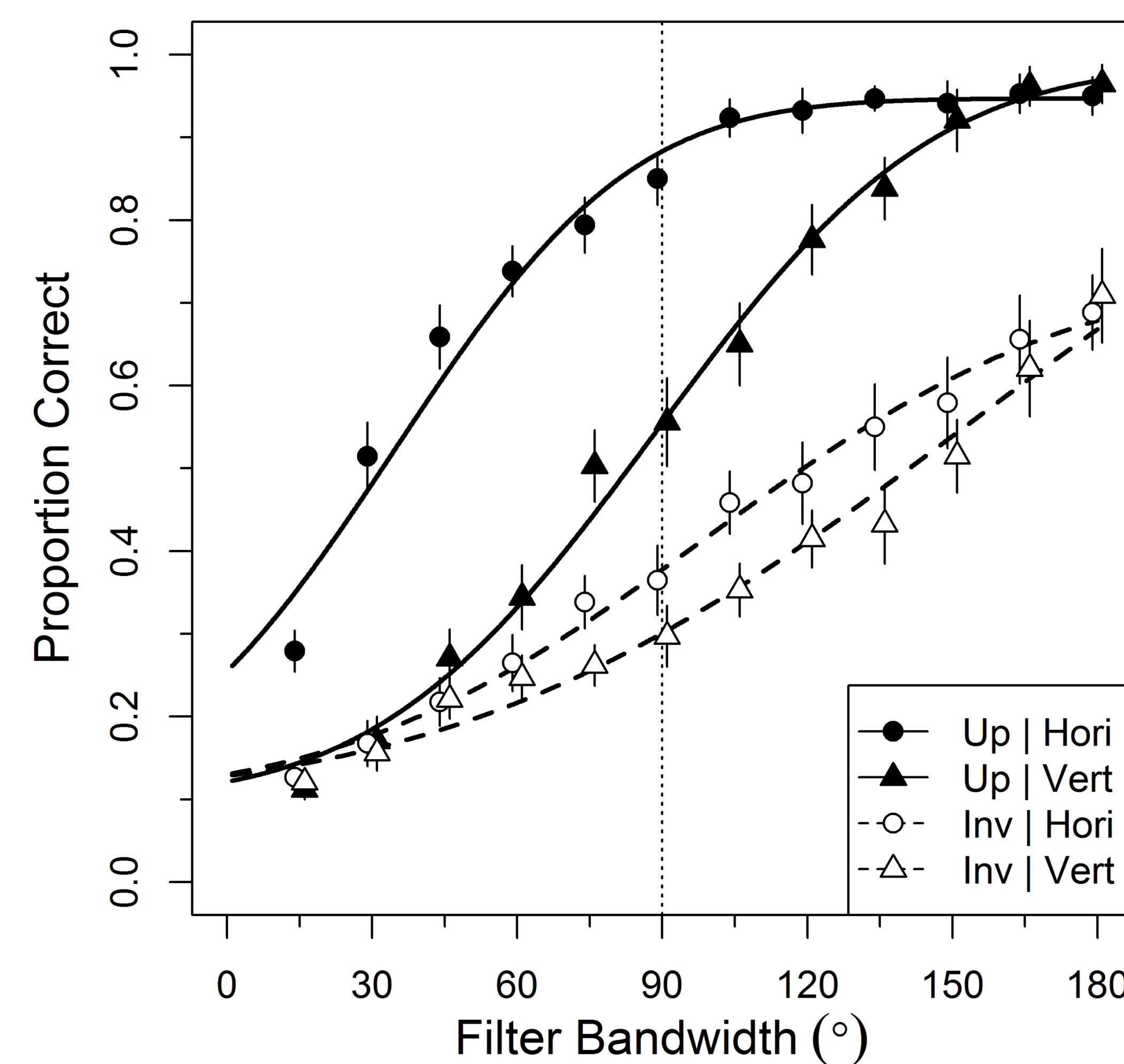
Temporal structure of a single trial. Observers selected their response with a mouse click

Filtering: Horizontal or vertical, bandwidth 15° to 180° in 15° steps, where 180° filters produce unmanipulated faces.

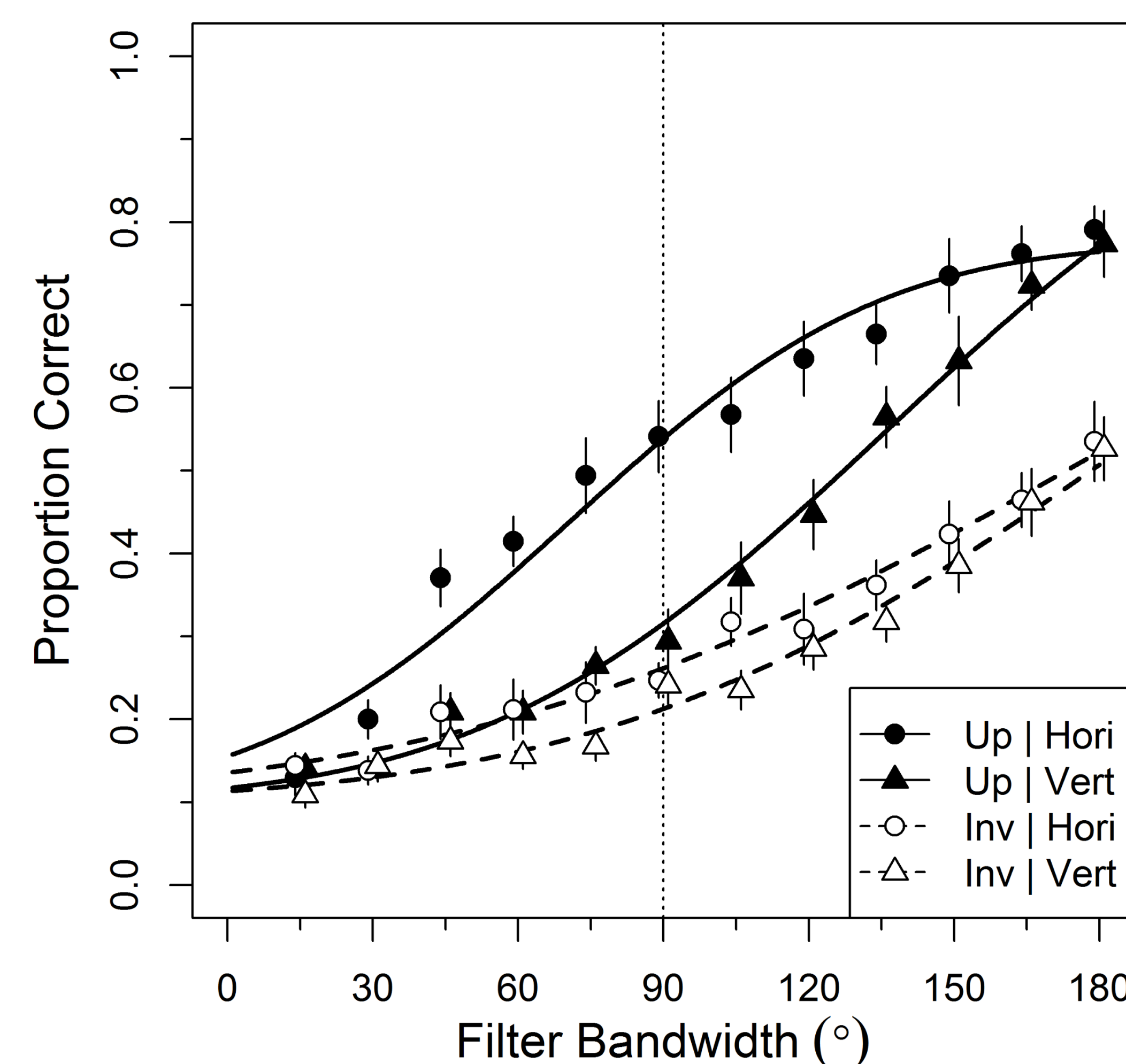


An example of two face identities (top and bottom rows) filtered to retain horizontal (left) or vertical (right) spatial frequency components with one of two bandwidths.

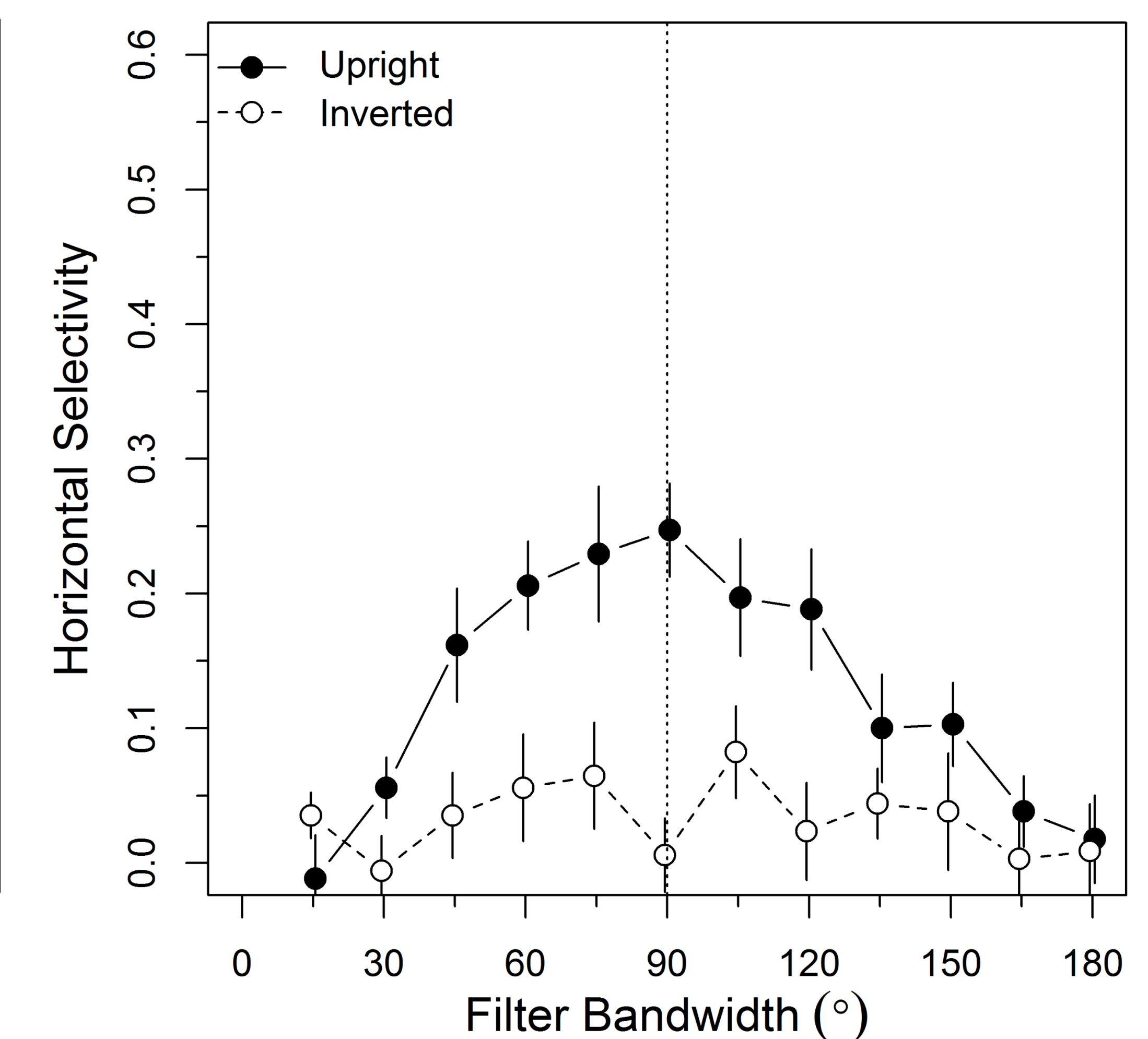
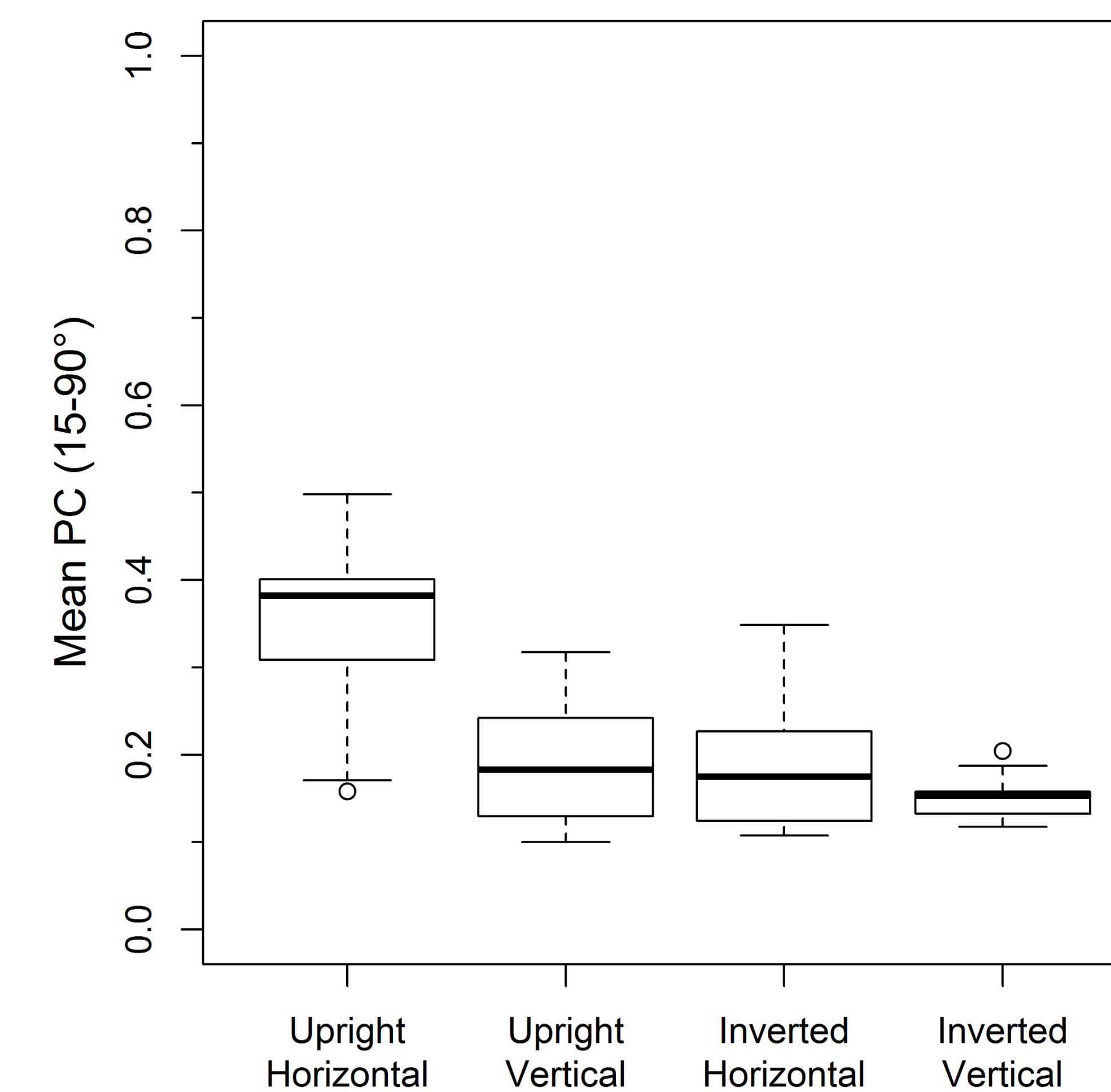
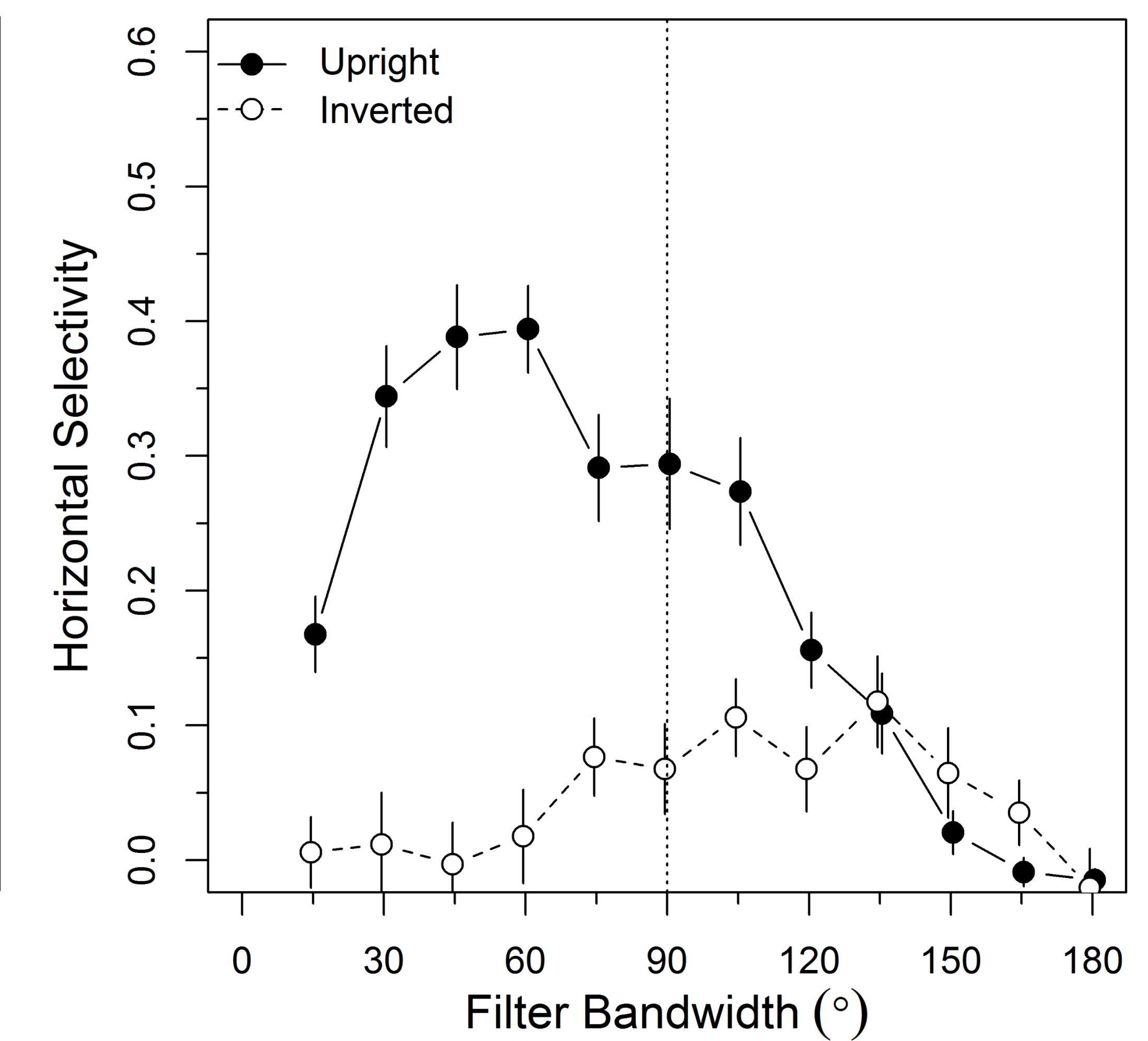
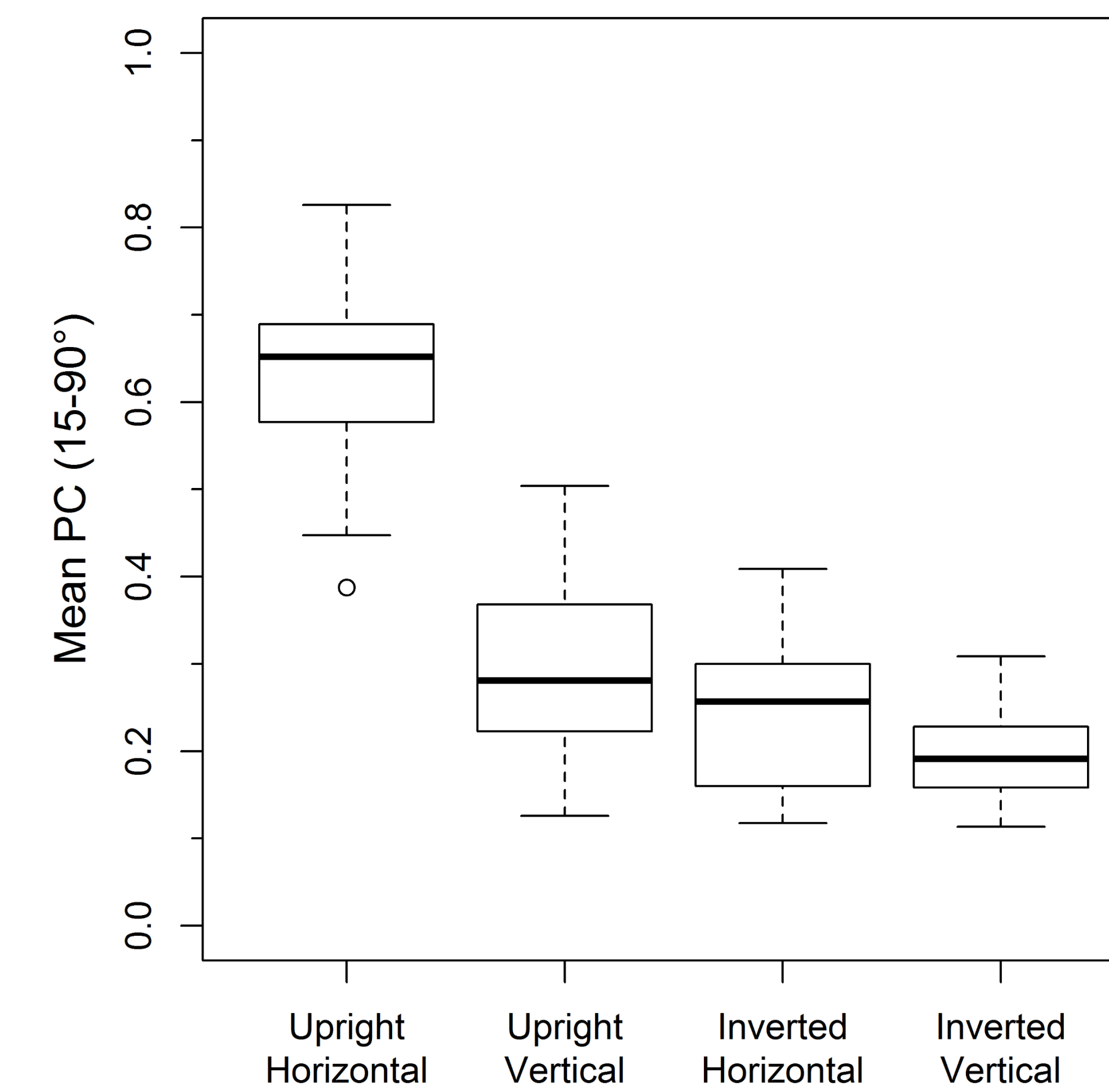
Familiar



Unfamiliar



Results



Left: Mean proportion correct on the 10-AFC discrimination task. **Middle:** Proportion correct averaged from 15° to 90°, where 90° is the largest bandwidth at which the filters isolate independent subsets of the orientation structure. **Right:** Horizontal selectivity, defined as the difference in proportion correct between horizontal and vertical filters at each bandwidth. In all three figure types, note that personal familiarity selectively improves sensitivity to horizontal structure in upright but not inverted faces.

Conclusions

Sensitivity to horizontal structure, relative to vertical, is enhanced in observers who are personally familiar with the face identities, even at the narrowest bandwidths.

Personal familiarity improves performance with inverted faces, but horizontal selectivity remains similar.

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References

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- Pachai, M. V., Sekuler, A. B., & Bennett, P. J. (2013). Sensitivity to information conveyed by horizontal contours is correlated with face identification accuracy. *Front Psychol*, 4, 1-9.
- Ramon, M., Caharel, S., & Rossion, B. (2011). The speed of recognition of personally familiar faces. *Perception*, 40, 437-449

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