Are social interactions processed holistically? Evidence from change blindness

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1. Background and current study

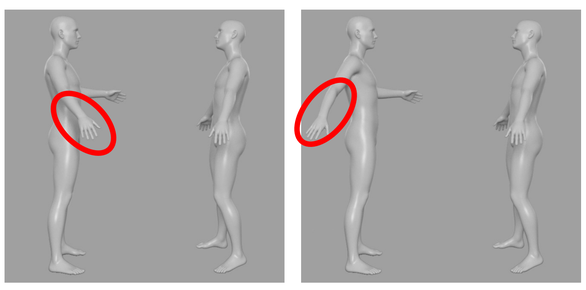
- Holistic processing is characterised as the integration of parts or features into a unified representation[1].
- Although observers are better at detecting changes that are applied to a feature of a face compared to a house, they are less able to pinpoint to location of the change for faces than houses[5].
- This is taken as evidence that faces are processed holistically, and houses and other objects are processed in a more piecemeal fashion [3,5.]
- Recent evidence suggests that similar to facial features in a face, upright face-to-face body dyads are also processed as a grouped unit[2,4].
- Our aims were to investigate holistic processing using this method in 1) intact vs broken interaction dyads 2) upright vs inverted intact interaction dyads.

2. Methods

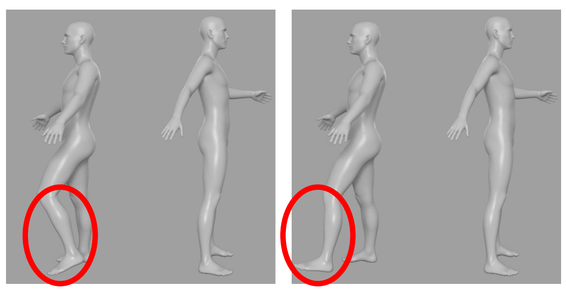
- **Materials:** using DAZ studio, 48 avatars were created. We created an edited version of each avatar by changing a single feature in each. Changes included: position of 1) head or neck 2) arm or hands 3) legs or feet or 4) the waist, hip or upper body (Overall 96 dyads; 48 facing and 48 non-facing dyads).

- **Experiment 1:** 2 x 2 mixed subjects design: Social Arrangement as the within-subject variable (e.g., 'face-to-face' vs 'back-to-back') and Task as the between-subject variable ('localisation' vs 'detection'). 200 participants took part in this experiment (100 in each task condition).

Face-to-face

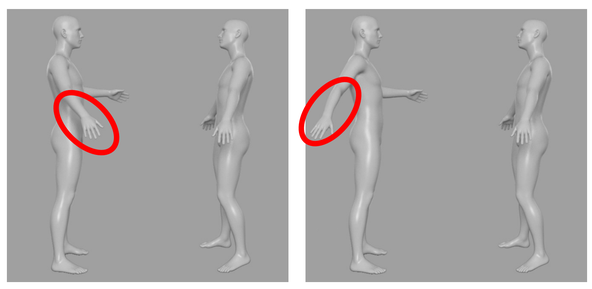


Back-to-back

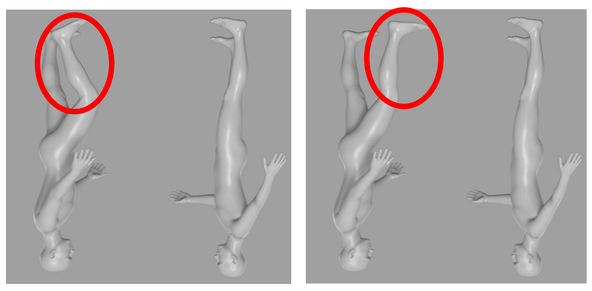


- **Experiment 2:** 2 x 2 mixed subjects design: Inversion as the within-subject variable (e.g., 'upright' vs 'inverted') and Task as the between-subject variable ('localisation' vs 'detection'). 100 participants took part in this experiment (50 in each task condition).

Upright



Inverted



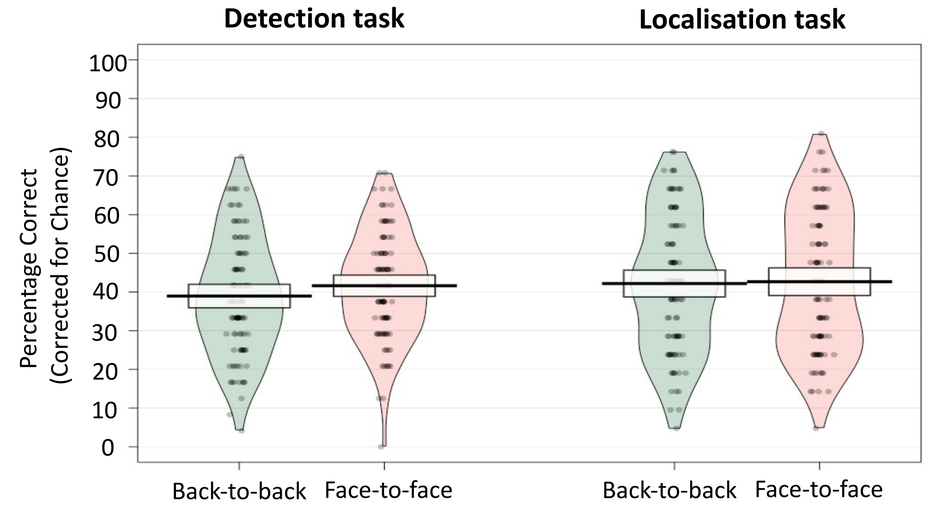
- **Hypotheses:**
  - *Experiment 1:* If facing dyads (intact interactions) are perceived holistically, participants should show a) increased accuracy for the detection of a change, and b) decreased ability to localise the change, in facing compared to non-facing dyads.
  - *Experiment 2:* If upright dyads are perceived holistically, participants should show a) increased accuracy for the detection of a change, and b) decreased ability to localise the change, in upright compared to inverted dyads.

- **Procedure:**
  - Experiments were conducted online via Gorilla.
  - Sequence of images: unedited image (1s) – blank screen (300ms) – edited image (1s).
  - **Change localisation task**: all trials involved a change. Participants indicated which of the 4 features was changed using a drop down list, they selected which figure it applied to by selecting the list on the right side of the screen if they thought the change was applied to the right figure and vice versa for the left figure.
  - **Change detection task**: only half of the trials involved a change. Participants had to indicate whether there was a change or not (but did not have to specify the change).

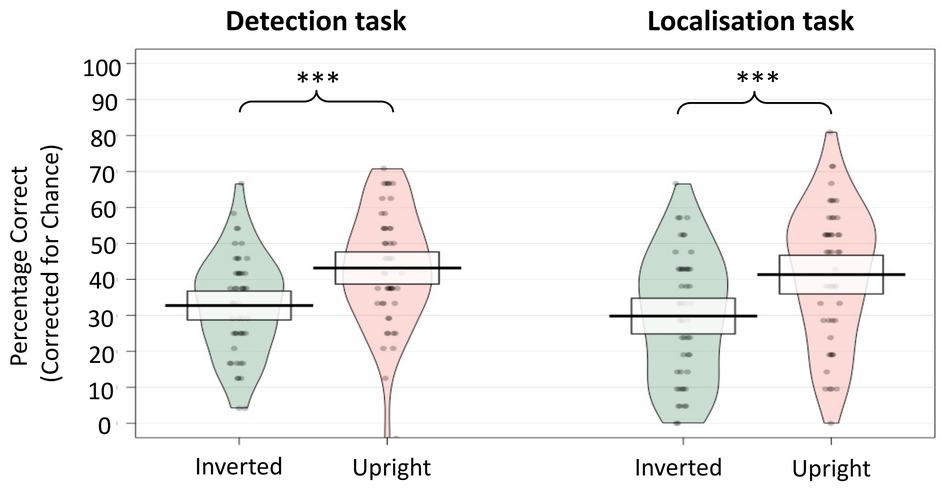
- **Dependent variables**:
  - **Change localisation task**: accuracy calculated as the percentage of correctly identifying the change feature in the right figure
  - **Change detection task**: accuracy calculated as the sum of the percentages of hits and correct rejections.
  - We then corrected each participant's accuracy score for chance: (% correct – % chance) ÷ (100% – % chance). This correction was conducted because chance performance was different for the change-detection task (50%) and the change-localization task (12.5%).

3. Results

- **Experiment 1:** The main effect of Task (p = .316), Arrangement (p = .194), and interaction (p = .828) were non-significant.

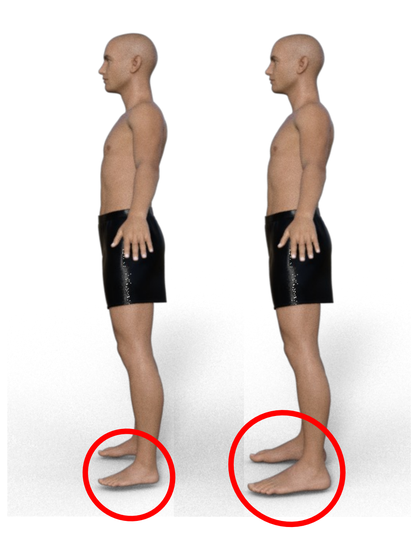


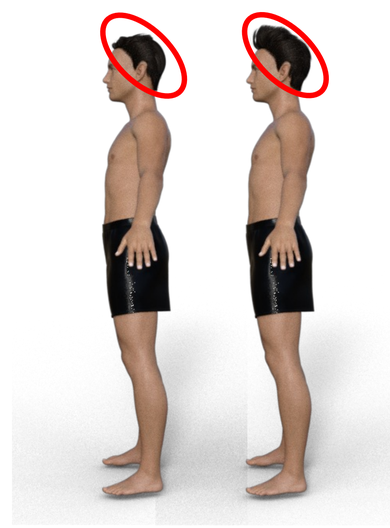
- **Experiment 2:** The main effect of Inversion was significant [$F(1, 98)$ = 19.36, p < .001, ηp^2 = .17], with participants more accurate at detecting changes in the upright (M = 42.25, SD = 17.33), than inverted images (M = 30.86, SD = 16.25). The main effect of Task (p = .364) and the Task x Inversion interaction (p = .958) were non-significant.



4. Discussion and future experiments

- In contrast to our hypotheses, in Experiment 1 we found no evidence of better change detection compared to change localisation for facing dyads or vice versa for non-facing dyads.
- In Experiment 2, we did not find a Task x Inversion interaction effect. However, regardless of the type of task, participants were better at detecting the changes when they were presented upright than inverted.
- The lack of significant interactions in both experiments may suggest that multiple bodies are not holistically processed. Alternatively, the null effects could be driven by: 1) this paradigm not reliably illustrating the costs and benefits of holistic processing for multiple bodies, or 2) the postural changes we made to the dyad stimuli do not allow us to capture holistic processing in this paradigm.
- We are following this up by making different types of changes to our stimuli, focusing on other kinds of bodily changes that more closely match the types of changes made in previous examples of the phenomenon.





5. References

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