Are social interactions preferentially attended in real-world scenes? Evidence from change blindness

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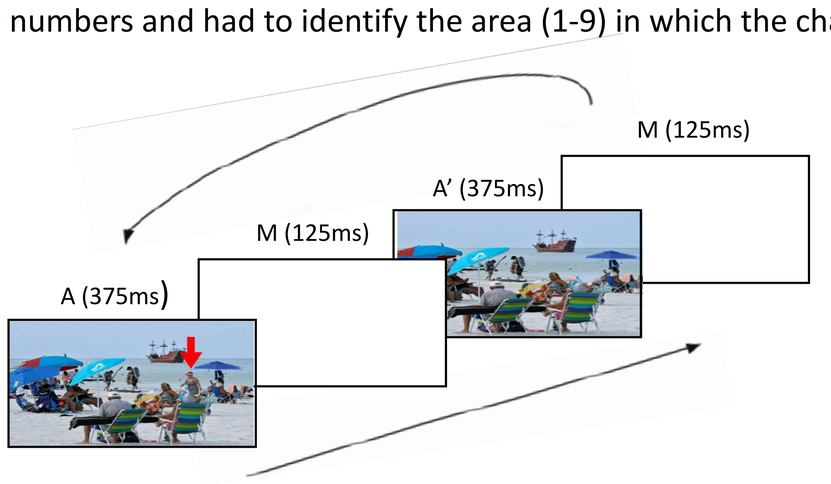
1. Background and current study

- Given the brain's capacity limitations, incoming sensory information must be selected for further processing.
- We are more likely to spot changes to social aspects than non-social aspects of a scene (e.g., people vs trees; 1; 3).
- Whilst previous research has focused on how individual faces and bodies are processed, there is growing interest in how observers process scenes containing multiple people (2; 6).
- Using a change detection task and real-world scenes, we aimed to explore whether changes are detected faster when they occur to individuals versus objects, and the extent to which it's important if the individuals are presented within a social interaction or not.

2. Methods

- **Experiments**: over three separate experiments, we explored change detection to complex real-world scenes, in which changes either occurred by the removal of a) an individual on their own, b) an individual who was interacting with others, or c) an object.
- Experiment 1 (*N = 50*), measuring change detection **for non-interacting individuals versus objects**, Experiment 2 (*N = 49*), measuring change detection for **interacting individuals versus objects** and finally, Experiment 3 (*N = 85*), measuring change detection **for non-interacting versus interacting individuals**.
- **Design:** 2 x 2 mixed subjects design: Social Condition as the within-subject variable (e.g., 'Individuals' vs 'Objects') and Orientation as the between-subject variable ('Upright' vs 'Inverted').
- We ran an inverted version of each task to determine whether differences were driven by low-level visual features.
- **Procedure:** Experiments were conducted entirely online via Gorilla. Participants were presented with a sequence of images: unedited image (A) – blank screen (M) – edited image (A') – blank screen (M), which continued until they indicated detection of the change OR until the trial ended (timed out at 30 seconds). Participants were then presented with the unedited image superimposed with a grid of 9 numbers and had to identify the area (1-9) in which the change occurred.



- All participants included in the analyses correctly responded on at least 70% of catch trials.
- Results from a rating study showed that targets in the 'social interaction' condition (*M* = 5.88, *SD* = 0.66) were perceived to be more highly engaged in a social interaction than those selected in the 'non-interaction' condition (*M* = 1.87, *SD* = 0.50), [$F(1, 20) = 661.50$, $p < .001$, $\eta p^2 = .97$].
- **Dependent variables**: Percentage accuracy and response times (for accurate responses).

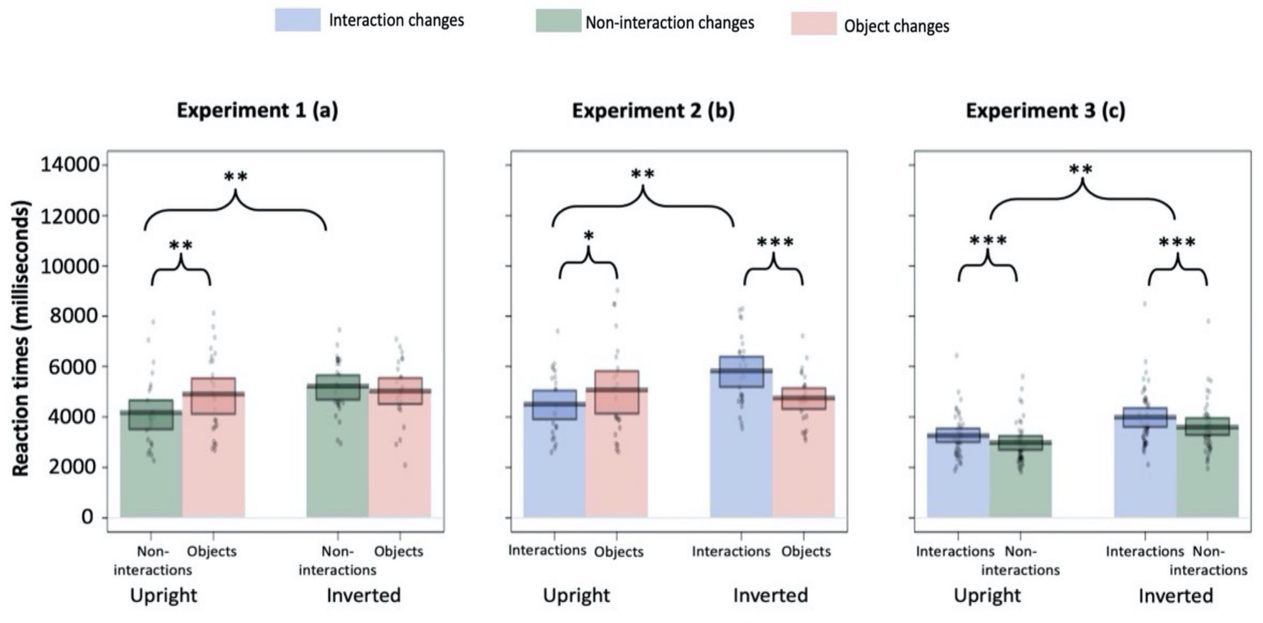
3. Results

- **Experiments 1 & 2:**

1. When presented upright, changes to individuals, whether non-interacting (Experiment 1) or interacting (Experiment 2), were detected better and more quickly than changes to objects.
2. Changes to individuals, whether non-interacting (Experiment 1) or interacting (Experiment 2), were detected more quickly when they were presented upright than inverted. No such inversion effect was seen for objects.

- **Experiment 3:**

1. Changes to individuals in non-interactions were detected faster than those presented within an interaction in both upright and inverted versions of the task.
2. The main effect of Orientation was also significant, where changes were detected faster when the scenes were presented upright.



4. Discussion

- Experiments 1 and 2 replicate effects found in previous studies, where changes to socially-relevant information are detected better and quickly than other changes in complex scenes (1; 3).
- Results from the inverted condition made it clear that these effects were not driven by incidental differences between the images or targets.
- In Experiment 3, we found an overall advantage for the detection of changes to non-interacting than interacting individuals.
- This effect could be driven by differences in low-level visual features of the images, for example, by differences between the images used in each condition, or differences in the targets that were selected.
- The results of all three experiments indicate that inverting the images diminished the change advantage effect for both non-interacting and interacting individuals, but this was not the case for objects, perhaps reflecting the holistic processing of people (4; 5; 7).

5. References

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