

The Influence of Another's Presence and Actions on Perspective Taking

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Introduction

How does observation of another's actions affect perspective taking? How does the possibility for bodily mapping affect perspective taking?

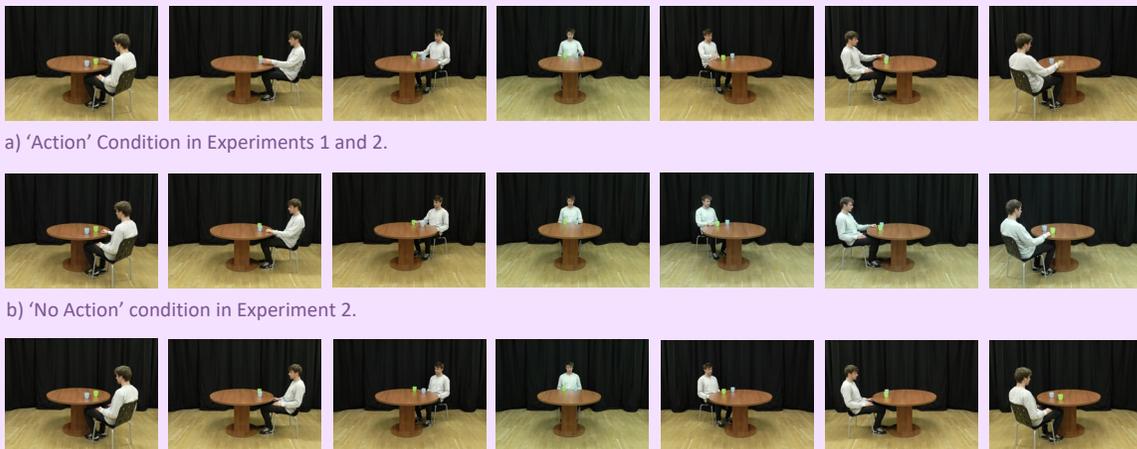
To answer these questions, we conducted three online experiments.

We hypothesised that action simulation through action observation will facilitate mental own body transformation when taking another's perspective. Therefore, we expected participants to be faster when taking the perspective of a person who was acting on an object compared to a person who was sitting still. We also aimed to replicate previous research findings^(1,2) predicting that the presence of a person should facilitate perspective taking, compared to an empty chair. This would show that the possibility for bodily mapping is important in perspective taking.

Experiments

- Experiment 1** had a within participant design with the factors Condition ('Action' and 'No Action'); and Angle (seven different angles: 45, 90, 135, 180, 225, 270, 315).
 - In the 'Action' condition, the model was reaching for an object on the table (Figure 1, row a).
 - In the 'No Action' condition, the model was having both of his hands on the lap (Figure 1, row b).
- Experiment 2** had the same design however in the 'No Action' condition, the model was having one of his hands on the table (Figure 1, row b) to visually resemble the 'Action' Condition more.
- Experiment 3** had a between participant design with the factors Condition: 'Person Present' (Figure 1, row c) and 'Person Absent' (an empty chair positioned at the same angles); and Angle.

Task: In all experiments, participants were asked to judge the position of an object relative the person or the chair in the pictures (e.g., "Is the blue cup on the right of the person?")



c) 'No Action' condition in Experiment 1 and 'Person Present' condition in Experiment 3.

Figure 1. Examples of the stimuli pictures in different conditions in Experiments 1, 2 and 3.

Results

Action in Perspective Taking

(Experiments 1 and 2)

- Participants were faster in the 'Action' condition compared to the 'No Action' condition both in Experiment 1 ($F(1, 77) = 9.56, p = .003, \eta^2 = 0.11$) and in Experiment 2 ($F(1, 75) = 4.75, p = .032, \eta^2 = 0.06$).

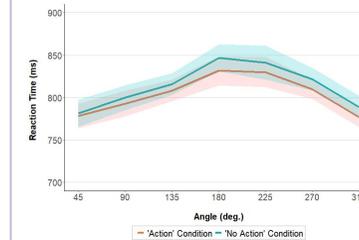


Figure 2. Mean Reaction Times in the 'Action' and 'No Action' Condition in Experiment 1 with 95% C.I's.

Bodily Mapping in Perspective Taking

(Experiment 3)

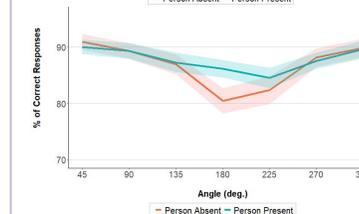
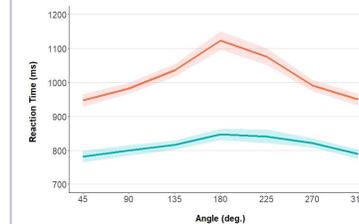


Figure 3. Mean Reaction Times (Upper Figure) and Accuracy Rates (Lower Figure) in the 'Person Absent' and 'Person Present' Condition in Experiment 3 with 95% C.I's.

- The differences between the 'Action' and 'No Action' conditions were smaller in Experiment 2.
- Participants were slower at higher angular disparities compared to lower angular disparities (significant effect of angle, $F(3, 221) = 11.58, p < .001, \eta^2 = 0.13$)

- Participants were faster and more accurate when taking the perspective of a person than when taking the perspective of a chair.
- These differences were bigger at higher angular disparities (significant interaction between Condition and Angle both in RTs, $F(4,599) = 11.21, p < .001, \eta^2 = 0.07$); and in accuracy rates, $F(4,615) = 3.60, p = .007, \eta^2 = 0.02$).

Discussion

Self-initiated Mental Own Body Rotation

As expected, we found increased reaction times at higher angular disparities between the participants and the model or the chair in the pictures in all our experiments. This pattern was also shown in previous studies and research has indicated that it reflects mental rotation of the self to the other's or object's orientation⁽³⁾. Slower reaction times at higher angular disparities reflect the magnitude of this rotation.

Action Observation in Perspective Taking

We found that seeing a person acting resulted in faster reaction times when taking their perspective. The processes behind this facilitation effect could include action observation processes activating the mirror neuron system.

The Importance of Bodily Mapping in Perspective Taking

The results of our Experiment 3 and previous studies^(1,2) show the importance of the presence of a human figure during perspective taking. However, more research is needed to determine which exact characteristics of the figure would be sufficient to cause these effects.

References

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