The role of perceptual factors in the reflexive attentional shift phenomenon.

SORANZO, Alessandro <http://orcid.org/0000-0002-4445-1968>, WILSON, Christopher and BERTAMINI, Marco

Published version

SORANZO, Alessandro, WILSON, Christopher and BERTAMINI, Marco (2016). The role of perceptual factors in the reflexive attentional shift phenomenon. In: 39th European Conference on Visual Perception (ECVP) 2016 Barcelona, Barcelona, 28 August 2016 - 1 September 2016.

Copyright and re-use policy

The role of perceptual factors in the reflexive attentional shift phenomenon

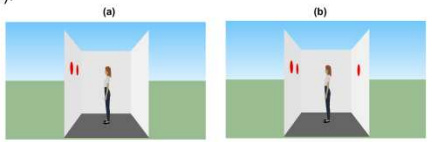
1P025

Alessandro Soranzo , Christopher Wilson and Marco Bertamini - a.soranzo@shu.ac.uk

Introduction

Spatial cueing of attention occurs when attention is oriented by the onset of a stimulus at a specific location (exogenous cuing) or by a cue at a location (Posner, 1980). Certain cues such as eyes or arrows have been known to orient attention towards target stimuli due to their social or biological relevance (Ristic & Kingstone, 2012).

Interestingly, the presence of a cue in the visual scene can interfere with participants' reporting of what they see. By using a *dot perspective task* paradigm, Samson et al (2010) found slower reaction times and higher error rates when the number of stimuli that the cue points to is different from the overall number of stimuli visible to the participant (Samson et al. 2010).



In both figures, a cue (avatar) is pointing towards two discs; however, whilst in a the viewer also can see two discs (congruent condition) in (b) the viewer can see three discs (incongruent condition). Interference occurs in (b) as participants are slower and produce more errors in reporting how many discs they see.

Two explanations have been advanced regarding what causes this effect:

- the **perceptual** explanation argues that perceptual factors of the cueing task are sufficient to explain the interference.
- the **social** explanation argues that perceptual factors are not sufficient on their own to generate interference but additional social processes need to occur.

The social explanation claims that, in addition to other processes, the cue itself has to be believed to have a point of view: "participants might not experience interference from the presence of the avatar if they thought that the avatar could not see" (Samson et al. 2010, page 1263); or interference is "depended on the attribution of a seeing mental state to the avatar" (Furlanetto et al. 2016).

Previous studies that have examined this aspect, but they found conflicting results:
- Furlanetto et al. (2016) used *different coloured goggles* to denote "seeing" and "non-seeing" avatars. However, the meaning of the colours of the goggles does not convey directly any perceptually relevant information; rather, it needs to be learned.

- Cole et al. (2016) and Baker et al. (2016) obscured/opened the view of the avatar with a *physical obstruction*. However, there was an extra component into the visual scene that adds complexity.

In addition, these studies employed a within-groups design to alternate between "seeing" and "non-seeing" conditions, potentially indicating to participants that they have to do something different in each condition.

Experiment

One between-subjects variable:
Cue type (Sighted avatar - Blindfolded avatar)

Two within-subjects variables:
Consistency (Consistent - Inconsistent)
Perspective [First Person Perspective (1PP) - Third Person Perspective (3PP)]

The dependent variables considered were RT and Error Rate.

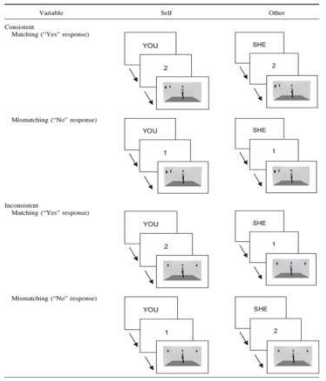
Method

Participants

Thirty-two participants took part in this experiment, Sixteen per each level of the Cue Type variable.

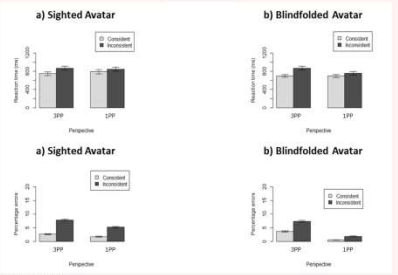
Procedure

Participants had to confirm whether the number shown previously is equal to the number of discs visible from the prompted perspective ("YOU" or "S/HE"). In relation to the 3PP trials: "When the prompt is S/HE, you have to indicate whether or not the avatar is pointing towards the number of discs previously indicated.



The Dot Perspective Task (Samson et al, 2010)

Results



Reaction time analysis

Cue type: ns; **Cue Type - Consistency**: *ns;* Int(**Cue Type - Perspective**): *ns*
Consistency: $F(1,30) = 55.18$; $p < 0.001$; $\eta^2 = 0.65$
[Inconsistent trials showing slower reaction times than Consistent trials]
Perspective: *ns;*
Int(**Consistency-Perspective**): $F(1,30) = 8.84$; $p = <0.01$; $\eta^2 = 0.23$
[Smaller consistency effects in 1PP trials than 3PP trials]

Error rate analysis

Cue type: ns Int(**Cue Type - Consistency**): *ns;* **Cue Type - Perspective**: *ns;*
Consistency: $F(1, 30) = 4.29$; $p<0.05$; $\eta^2 = 0.13$
[More Errors in Inconsistent trials than Consistent trials]
Perspective: $F(1,30) = 30.78$; $p < 0.01$; $\eta^2 = 0.5$ [Less errors in 1PP (4.6%) than 3PP trials (10.67%)]
Int **(Consistency - Perspective)**: $F(1,30) = 50.75$; $p. < 0.05$; $\eta^2 = 0.16$
[Smaller consistency effects in 1PP trials than 3PP trials]

Conclusions

The interference persisted even when the participants believed that the avatar could not see. The comparison of first person interference between the sighted avatar and the blindfolded avatar revealed no difference.

The two conditions were equally powerful in eliciting the interference.

The results support a *perceptual* interpretation of interference and challenge previous findings that suggest interference is the result of an intrinsically social process. Consistent with previous research, we found that a form of interference emerges in certain instances when participants are asked to adopt a first-person perspective and a cue is present (1PP-interference).

These findings suggest that the effect is not modulated by mental state attribution. It can be concluded that the directional features of the cue, readily discernible by visual processes, are sufficient to orient attention leading to interference.

References

Baker, L.J., Levin, D.T. and Saylor, M.M.. (2016). The extent of default visual perspective taking in complex layouts. Journal of Experimental Psychology: Human Perception and Performance, 42(4), pp. 508-516.

Cole, G. G., Atkinson, M., Le, A. T. D., & Smith, D. T. (2016). Do humans spontaneously take the perspective of others? Acta Psychologica, 164, 165–168.

Furlanetto, T., Becchio, C., Samson, D., & Apperly, I. (2016). Altercentric interference in level 1 visual perspective taking reflects the ascription of mental states, not submentalizing. Journal of Experimental Psychology. Human Perception and Performance, 42(2), 158–163

Posner, M. I. (1980). Orienting of attention. The Quarterly Journal of Experimental Psychology, 32(1), 3–25.

Ristic, J., & Kingstone, A. (2012). A new form of human spatial attention: Automated symbolic orienting. Visual Cognition, 20(3), 244–264.

Samson, D., Apperly, I. a., Braithwaite, J. J., Andrews, B. J., & Bodley Scott, S. E. (2010). Seeing it their way: evidence for rapid and involuntary computation of what other people see. Journal of Experimental Psychology. Human Perception and Performance, 36(5), 1255–1266.