Implicit biases about invisible forces that project from the eyes

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ABSTRACT

The extramission theory of vision theorizes that visual perception occurs by beams emitted from the eyes and bouncing off of objects in the world. This account can be found in ancient Greek texts, and remains a persistent belief in folk science. One manifestation of this belief is the "evil eye," popular in many cultures, in which a curse stems from a malignant glare. In the late nineteenth and early twentieth century, Titchner[3] and Coover[4] studied the belief in a force that projects from the eyes and is detectable by others. In the 1970s, Piaget noted that children hold a naïve belief in an extramission theory of vision,[5] and in the 1990s it was shown that more than half of American college students maintain this belief.[6-8] This maintenance of extramission-like beliefs is indicative of a deeper cognitive mechanism that results in these intuitive assumptions about the mechanism of vision. This implicit model which attributes a mechanical force to a human agent's vision may be part of the brain's pre-determined social representations.

METHODS

In the experiment, subjects view an image of a table with a paper tube upright in the center. The width and height of the tube varies among trials. The subjects are asked to imagine the tube being gently tilted until it reaches a critical angle at which it naturally topples over as opposed to naturally returning to vertical. An arrow in the display indicated whether to judge a leftward or rightward tilt. Subjects reported their estimate of the critical tilt angle by using the F and J keys to adjust the angle of an initially vertical line. In addition, a photograph of a person's face is shown next to the table. The face is either looking at the tube, or blindfolded facing the tube, and the face is positioned either to the right or left of the table. The face is not mentioned to the subjects in the instructions and is irrelevant to the subject's task.

The behavioral task requires the subject to judge the tilt at which a paper tube would likely topple over. After reading the task instructions on a computer monitor, the subject see an instructional video, showing real paper tubes, to understand the task. The subject then proceed with the experiment on the computer monitor. The experiment is being implemented through Amazon's Mechanical Turk. The subjects never receive any information in the instruction period about the human agent displayed next to the table. They are neither told to ignore it nor to attend to it. Its presence is not explained and any possible impact it might have on the tube is never mentioned. It is seemingly irrelevant to the task.

Instructional Video:

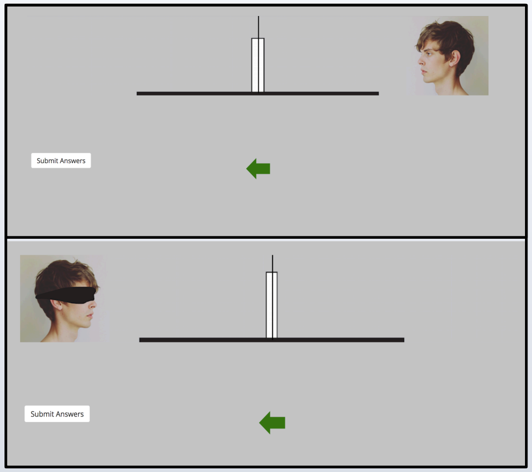

Figure 1. Example displays from Experiment 1. On each trial, subjects usethe F and J keys on a keyboard to tilt the black line in the direction of the green arrow, to estimate the critical angle at which the tube would fall over. Subjects press the 'Submit Answers' button to indicate their final choice. The following factors are randomly varied across interleaved trials: whether the face is on the left or right, whether the face is blindfolded or not, whether the direction of tilt is toward or away from the face, and the size of the tube (four possible shapes).

Questionnaire

In experiment 1, after completing the tilt-estimation experiment, each subject answered a series of questions on the computer display.

Question 1: In two or three sentences what do you think the purpose is of the experiment you just completed. What do you think we were studying?

Question 2: Please explain how eyesight vision works in one to two sentences:

Question 3: Do you intuitively think of vision as a process where something is leaving your eye or as a process where something is coming into your eye?

Question 4: Do you think the person in the display affected your responses?

In the display, a black line is overlaid on the tube and a green arrow is placed below the tube. The subject's task is to tilt the black line in the direction indicated by the black arrow, by using the F and J keys on a standard keyboard, to indicate the critical angle at which the subject judges that the paper tube should fall over. Once the black line is adjusted to the desired tilt, the subject presses the return key to report the answer. Each trial is self-paced, not advancing until the subject completes the answer. The scene on the monitor then disappears and no feedback is given.

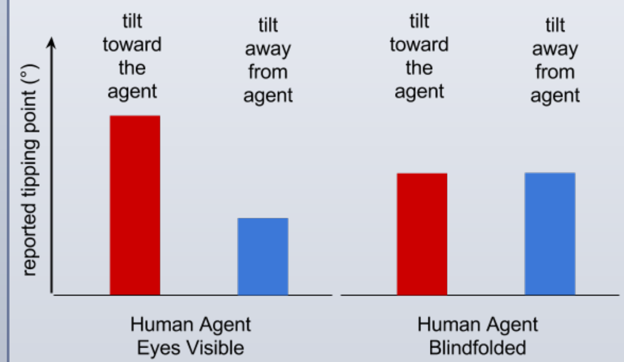

Figure 2. Of the 4 condensed trial types, this is the expected pattern of behavior comparing when the human agent on the screen was gazing at the tube versus when the human agent was not gazing at the tube. The hypothesis is that when the human agent is shown gazing directly at the tube, the subject will report less tilt necessary (because they will implicitly add an additional force for the gaze of the agent on the screen) and more of a tile necessary to topple the tube when the tube is being tilted towards the human agent (because the tilt is working against the implicit force of the human agent's gaze). If the hypothesis is correct, then there should be no difference between the tilt angles when the human agent on the screen is blindfolded, because the subject should not be accounting for the agent on the screen's gaze.

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