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Original Article

Attentiveness to eyes predicts generosity in a reputation-relevant context

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ABSTRACT

Eyes play a vital role in human social interactions. In fact, some prior work indicates that simply the presence of eyes or eye-like stimuli increases people's prosocial behavior, arguably because the eyes serve as cues of being watched and thus elicit reputational concerns. The current study was designed to address two questions in this regard. First, we examined how salient the eyes are among the human features. Second, we asked whether individual differences in attentiveness to eyes (but not other human features such as ears or hands) are predictive of reputation-enhancing behavior. Using an eye-tracking paradigm, we found that participants looked longest to eyes compared to other human features. Critically, greater attentiveness to eyes correlated with greater generosity on a donation task, but only in a reputation-relevant context (i.e., when donations were public but not when they were anonymous). Attentiveness to other human features did not predict donation behavior. Eyes are thus an especially salient human feature, and attentiveness to eyes may signal individuals' concerns about their reputations.

1. Introduction

Eyes play a critical role in helping us navigate our social environment. They allow us to detect the presence and some of the contents of other minds, and they are vital for initiating, maintaining, and regulating collaborative interactions (Grossmann, 2017). These vital social functions lead the eyes to be highly salient to humans. For instance, humans focus more heavily on the eye region when scanning faces than chimpanzees (Kano & Tomonaga, 2010). Furthermore, when following others' gaze, human infants use eye gaze direction whereas other great apes rely more on head direction (Tomasello, Hare, Lehmann, & Call, 2007). Eyes thus attract attention and guide human social behavior from early in development.

In addition, eyes are thought to serve vital cooperative functions. In particular, the presence of eyes has been found to increase prosocial behavior, both in economic games and in real-life contexts (the so-called "watching eyes" effect; see Nettle et al., 2013, for a review). For instance, adults gave significantly more money towards a common good when an image of a pair of eyes was visible during the donation compared to when an inanimate object (e.g., flower) was present (e.g., Bateson, Nettle, & Roberts, 2006). This effect has been demonstrated across a range of prosocial behaviors, such as increased removal of litter, increased voter turnout, reduced bicycle theft, and so on (e.g., Bateson, Callow, Holmes, Redmond Roche, & Nettle, 2013; Burnham & Hare, 2007; Ekström, 2012; Ernest-Jones, Nettle, & Bateson, 2011; Haley & Fessler, 2005; Nettle, Nott, & Bateson, 2012; Panagopoulos, 2014a, 2014b).

This cooperation-enhancing effect of eyes is thought to arise from people's strong motivation to manage their reputations (Bateson et al., 2006; Haley & Fessler, 2005). Human cooperative behavior is arguably maintained in large part by the reputational costs that individuals incur when they break cooperative norms (Fehr & Gächter, 2002; Milinski, Semmann, & Krambeck, 2002; Wedekind & Milinski, 2000). As a result, adults and even young children behave more prosocially when being watched by others (e.g., Bull & Gibson-Robinson, 1981; Engelmann, Herrmann, & Tomasello, 2012; Kurzban, 2001; Piazza, Bering, & Ingram, 2011). Since eyes or eye-like stimuli cue that one is being watched, they trigger similar reputational concerns and thus increase prosociality (Haley & Fessler, 2005).

In spite of the many studies showing an effect of watching eyes on a variety of prosocial behaviors, the robustness of the phenomenon has been called into question by studies that have failed to find the effect (Carbon & Hesslinger, 2011; Fehr & Schneider, 2010; Saunders, Taylor, & Atkinson, 2016; Sparks & Barclay, 2015). Indeed, a recent meta-analysis found that artificial surveillance cues do not reliably increase generosity (Northover, Pederson, Cohen, & Andrews, 2017). Additionally, some studies indicate that the effect is apparent under certain conditions but not others. For instance, there is some evidence that eye images increase prosocial behavior towards in-group but not out-group members (Mifune, Hashimoto, & Yamagishi, 2010), and that the effect is modulated by the number of real people in the vicinity (e.g., Bateson et al., 2013; Powell, Roberts, & Nettle, 2012). Moreover, a meta-analysis of 25 studies showed that the effect emerges reliably after short exposures to images of eyes, but not after long exposures

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(Sparks & Barclay, 2013; though see Panagopoulos, 2014b). Given these mixed findings, the jury is still out on the robustness and the generalizability of the cooperation-enhancing effect of watching eyes.

An important way to advance our understanding of this phenomenon is to inquire about the moderating role of individual differences. That is, is the watching eyes effect more apparent in individuals with certain characteristics? One participant characteristic that seems especially meaningful to consider is how concerned individuals are about their own reputations. Specifically, individuals who are more concerned about their reputations could plausibly be more sensitive to cues that trigger reputational concerns. One may thus predict that individuals who are more attentive to reputation-management cues such as eyes should also show greater prosociality when their reputations are at stake. That is, individuals' propensity to attend to eyes, insofar as it serves as an index of their reputational concern, should be related to how generous they are in situations in which they can enhance their reputations but not in situations in which they cannot enhance their reputations. Our first goal in the present study was to test this prediction.

Importantly, if the propensity to attend to eyes really is an index of reputational concern, then we may additionally predict that individuals' propensity to attend to other human features (such as the ears or hands) should not show a similar association with generosity in reputation-relevant situations. This is because whereas all human features cue the presence of another person, which may serve important functions such as making individuals feel more social or reminding them that they are part of a group, the eyes are unique among the human features in their “monitoring” function and are therefore an especially relevant cue for reputation-management (see Manesi, Van Lange, & Pollet, 2016). Thus, if attentiveness to eyes does index individuals' reputational concerns, then we should see a specific association between attentiveness to eyes and prosocial behavior in a reputation-relevant context but should see no association between attentiveness to other human features in the same context. Our second goal was thus to test for the specificity of this association.

The present study was designed to address these important questions about the cooperative functions of eyes. We first presented participants with pictures of eyes among pictures of other human features and used an eye tracker to assess participants' attentiveness to eyes versus the other features. Participants were then given a ‘windfall’ of $10 and the opportunity to donate money. Half the participants donated publicly and the other half donated anonymously. Given the evidence that eyes are a highly salient stimulus, we predicted that participants would attend more to eyes than to other human features. Furthermore, based on our proposal that greater attentiveness to cues that trigger reputational concerns (eyes) should be associated with greater reputation management, we predicted that participants' attentiveness to eyes (but not to the other human features) would be associated with their donation amount, but only when their reputations were at stake (i.e., in the public but not the anonymous donation context).

2. Method

2.1. Participants

The final sample consisted of 131 undergraduate students ($M_{age} = 18.89$ years, $SD = 1.13$; 71.8% female). The majority of the participants were Caucasian (66.4% Caucasian, 21.4% Asian, 5.3% African American, and 6.9% other). An additional 7 students participated but were excluded for having eye-tracking data for <20% of their total trials ($n = 4$) or because they were outliers (gaze duration to eyes was >3 absolute deviations from the median; $n = 3$; see Results for more information). Participants were assigned to one of two conditions: public donation ($n = 65$) or anonymous donation ($n = 66$). There were no significant differences in gender or race distribution across conditions (all $ps > 0.24$). Participants were compensated with course credit and up to $10 based on their decision in the donation task. The procedure was approved by the authors' institutional IRB and all participants provided informed consent.

2.2. Design and materials

Participants viewed a series of circular arrays (76 cm in diameter) with six equidistant and equal-sized pictures of human features (2.54×5.08 cm each). Each array contained a photo of eyes, nose, mouth, ear, hands, and feet. Further, there were four different types for each feature. For example, there were brown male eyes, blue male eyes, brown female eyes, and blue female eyes. In total, participants viewed 24 arrays in a randomized order with positions and types of human features counterbalanced within and across participants. Pictures of facial features were taken from a previously validated FACES database (http://faces.mpib-berlin.mpg.de). The areas of the eyes, nose, and mouth were individually cropped from photographs of Caucasian male and female models (ages 19–30) displaying neutral expressions. All of these facial features were forward facing (e.g., gaze of eyes was directed towards the participant). In addition, pictures of ears, hands, and feet were taken from Google Images. Regions of Interest (ROIs) were created using Tobii Studio (Version 3.3.0; Tobii Technology, Stockholm, Sweden). ROIs of 225×150 pixels were created to be non-overlapping and encompassing the entirety of each individual feature on the display. Animated distractors provided by Tobii Studio were placed randomly between trials to regain participants' attention. (Note that participants were also presented trials containing facial features among inanimate objects such as a car or a bowl in the same circular configuration, as well as trials containing neutral-expression faces. However, the present study only discusses findings from the trials featuring human features.)

2.3. Eye tracking procedure

In a lab setting, participants sat approximately 60 cm from a 24-in. monitor (52 cm $\times$ 32 cm) with a resolution of 1680×1050 pixels. The eye tracking unit (Tobii model X120; Tobii Technology, Stockholm, Sweden) with bright pupil capture setting (see also Jackson and Sirois, 2009) was positioned below the monitor and measured participants' eye movements at a sampling frequency of 60 Hz. Stimulus presentation and data recording were carried out using Tobii Studio. First, participants completed a 9-point calibration procedure. They were then instructed by the experimenter to freely gaze at the display but were not given further instructions about where to direct attention. The experimenter then went behind a curtain, out of the participant's view, and initiated the stimulus presentation. Each trial consisted of three segments: 1) blank screen for 0.5 s, 2) fixation cross for 1 s, and 3) circular array for 5 s.

2.4. Donation task

After the presentation of the arrays of human features, the following announcement appeared on the screen: “As a token of our appreciation, we'd like to give you $10 for participating in the study. In addition, part of our lab is involved in raising money to promote child development (e.g., buying toys and educational materials). You may elect to donate any amount of money you have earned as part of your participation in this study.” Participants were able to select donation amounts on the screen in dollar intervals ranging from $0 to $10. In the anonymous condition, the announcement additionally stated, “Your donation is completely voluntary and anonymous.” In addition, participants in the anonymous condition were instructed to see themselves out and, upon exiting the experimental room, to collect the remaining dollar amount (i.e., $10 minus the amount they had donated) in an envelope placed on a table. In contrast, the instructions in the public condition did not guarantee anonymity and instead stated that the researcher