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Cues of being watched enhance cooperation in a real-world setting

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We examined the effect of an image of a pair of eyes on contributions to an honesty box used to collect money for drinks in a university coffee room. People paid nearly three times as much for their drinks when eyes were displayed rather than a control image. This finding provides the first evidence from a naturalistic setting of the importance of cues of being watched, and hence reputational concerns, on human cooperative behaviour.

Keywords: cooperative behaviour; altruism; reputation; eyespots

1. INTRODUCTION

People tend to be generous, even toward unrelated individuals (Fehr & Fischbacher 2003). This is true even in situations where there is no prospect of repeat interaction, and hence no potential for direct reciprocity (Gintis *et al.* 2003). A possible mechanism maintaining generosity, where direct reciprocity is absent, is the motivation to maintain a pro-social reputation (Alexander 1987; Roberts 1998). Theoretical models show that cooperation in sizeable groups can, in theory, be maintained where potential partners have information about a person's past behaviour and use it in making decisions about interaction (Nowak & Sigmund 1998; Panchanathan & Boyd 2004). In indirect reciprocity models of this kind, individuals with a history of non-cooperation are shunned and thus pay a long-term cost for their behaviour. Consistent with such models, laboratory experiments have shown that people increase their levels of cooperation when they know their behaviour is being observed by others, and also use reputational information in deciding how to interact with others (Milinski *et al.* 2002*a*,*b*; Wedekind & Braithwaite 2002; Barclay 2004).

Recent studies have shown that even when subjects are told they are anonymous, they respond to subtle cues of being watched, such as the presence of eye-like spots on the background of the computer on which they complete the task (Haley & Fessler 2005; Burnham & Hare in press). However, these studies were based on artificial laboratory scenarios, and the effects of such cues on naturally occurring cooperative behaviour remain to be demonstrated. Here, we investigate whether subtle cues of being watched can increase contributions to a public good in a real-world setting where people have the option of contributing or not, using their own money. Specifically, we test the hypothesis that participants will contribute more money to an honesty box (also known as an honour box) in the presence of an image of a pair of eyes than in the presence of a control image of flowers.

2. MATERIAL AND METHODS

Participants came from a population of 48 members (25 females and 23 males) of the Division of Psychology at the University of Newcastle, who had the option to pay for tea and coffee via an honesty box. This system of payment for drinks had been in place for several years prior to the commencement of the current study. Instructions for payment remained constant throughout the experiment, and were posted on a black and white A5-sized (148 mm high × 210 mm wide) notice. The notice was displayed at eye height on a cupboard door located above a counter on which was situated the honesty box and also the coffee and tea making equipment; the fridge containing the milk was below the same counter. The notice featured a 150 × 35 mm banner that alternated each week between an image of a pair of eyes and an image of flowers printed above the prices for tea, coffee and milk (30, 50 and 10 pence, respectively). A different image was used each week to control for any effects attributable to a single image. The images of eyes varied in the sex and head orientation, but were all chosen such that the eyes were looking directly at the observer. In addition to the notice, all members of the department were informed by email approximately every six months about the arrangements for payment for tea and coffee; the most recent reminder was sent approximately one month prior to the commencement of this study. From the perspective of the participants, the only change introduced at the start of the experiment was the inclusion of the image banner on the notice. Participants were naive to the purposes of the manipulation and none reported being aware of these. The layout of the coffee room is such that it is unlikely that anyone failing to pay would be observed. Hence, contributions were effectively anonymous, and participants could choose whether and how much to pay for their drinks.

Each week we recorded the total amount of money collected in the honesty box. Throughout the period of the study, supplies of tea, coffee and milk were maintained to keep up with demand, and each week, the volume of milk consumed was recorded as the best index available of total beverage consumption. We computed the ratio of money collected to the volume of milk consumed in each week to control for weekly variation in consumption.

3. RESULTS

The ratio of money collected to milk consumed for each of the 10 weeks is shown in figure 1, along with the image on the banner for that week. Contribution levels always increased with the transition from flowers to eyes, and decreased with the transition from eyes to flowers. A general linear model with factors image type (fixed) and week (covariate) fitted to log-transformed data explained 63.8% of the variance. There was a significant main effect of image type (eyes versus flowers: $F_{1,7}=11.551$, $p=0.011$) but not week ($F_{1,7}=0.074$, $p=0.794$). The interaction between image type and week was omitted from the model because it was not significant. On average, people paid 2.76 times as much in the weeks with eyes (mean ± s.e. = 0.417 ± 0.081 £ per litre) than with flowers (0.151 ± 0.030 £ per litre). There was no evidence that image type affected consumption.

4. DISCUSSION

Our results show that an image of a pair of eyes appearing to observe behaviour dramatically increases contribution to a public good in a real-world context where participants were behaving naturally and using their own money.

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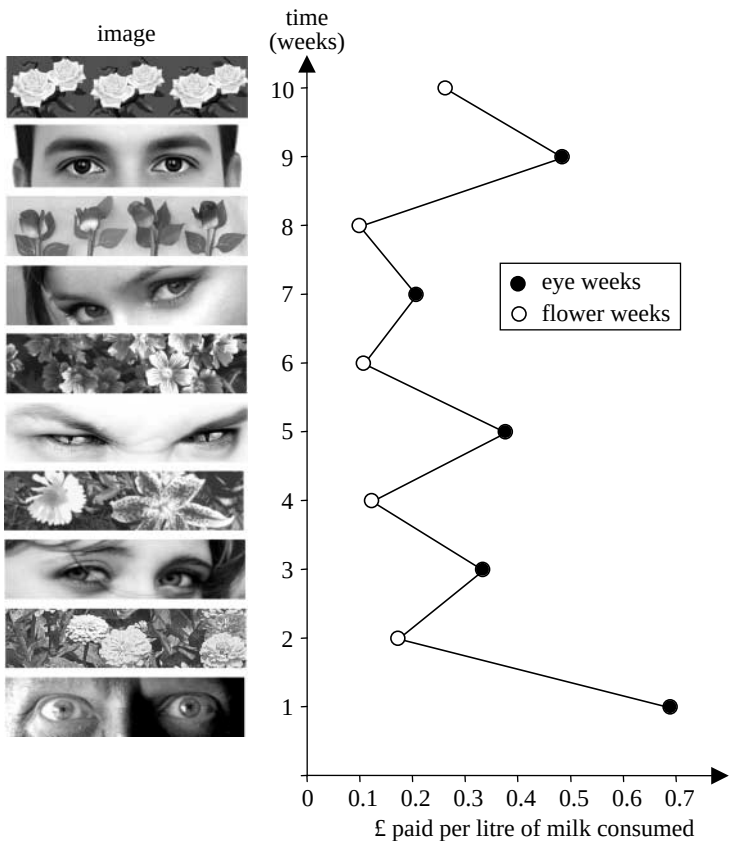

Figure 1. Pounds paid per litre of milk consumed as a function of week and image type.

Why does an image of a pair of eyes motivate cooperative behaviour? While it is possible that the eyes were simply more effective than the flowers at attracting people's attention to the notice, we do not believe that this is the explanation for our findings. The participants had all been informed prior to the experiment that they were supposed to pay for their drinks. Furthermore, the notice was positioned such that it was not possible that anyone making drinks would fail to see it, irrespective of the image displayed.

Instead, we believe that images of eyes motivate cooperative behaviour because they induce a perception in participants of being watched. Although participants were not actually observed in either of our experimental conditions, the human perceptual system contains neurons that respond selectively to stimuli involving faces and eyes (Emery 2000; Haxby *et al.* 2000), and it is therefore possible that the images exerted an automatic and unconscious effect on the participants' perception that they were being watched. Our results therefore support the hypothesis that reputational concerns may be extremely powerful in motivating cooperative behaviour.

Our findings have practical interest for those designing honesty-based systems, or wishing to maximize contributions to public goods. They also have theoretical implications. Faced with the relative generosity of human cooperation, even when interactions are explicitly anonymous and not repeated, some scholars have argued that humans are not always maximizers of individual self-interest (Camerer & Fehr 2006), but instead have been shaped to be pro-social or other-regarding by a history of group selection (Gintis 2000; Gintis *et al.* 2003). A simpler explanation is simply that humans are strongly attuned to cues that generally indicate reputational consequences of behaviour (Burnham & Johnson 2005; Haley & Fessler 2005). If even very weak, subconscious cues, such as the photocopied eyes used in this experiment, can strongly enhance cooperation, it is quite possible that the cooperativeness observed in other studies results from the presence in the experimental environment of subtle cues evoking the psychology of being observed. The power of these subconscious cues may be sufficient to override the explicit instructions of the experimenter to the effect that behaviour is anonymous. If this interpretation is correct, then the self-interested motive of reputation maintenance may be sufficient to explain cooperation in the absence of direct return.

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