

Original Article

Effects of eye images on everyday cooperative behavior: a field experiment

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Initial receipt 6 May 2010; final revision received 23 October 2010

Abstract

Laboratory studies have shown that images of eyes can cause people to behave more cooperatively in some economic games, and in a previous experiment, we found that eye images increased the level of contributions to an honesty box. However, the generality and robustness of the eyes effect is not known. Here, we extended our research on the effects of eye images on cooperative behavior to a novel context—littering behavior in a university cafeteria—and attempted to elucidate the mechanism by which they work, by displaying them both in conjunction with, and not associated with, verbal messages to clear one's litter. We found a halving of the odds of littering in the presence of posters featuring eyes, as compared to posters featuring flowers. This effect was independent of whether the poster exhorted litter clearing or contained an unrelated message, suggesting that the effect of eye images cannot be explained by their drawing attention to verbal instructions. There was some support for the hypothesis that eye images had a larger effect when there were few people in the café than when the café was busy. Our results confirm that the effects of subtle cues of observation on cooperative behavior can be large in certain real-world contexts.

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Keywords: Eyes; Cooperation; Prosocial behaviour; Field experiment

1. Introduction

Human societies are characterised by high levels of cooperative behaviour (that is, behaviour that benefits other individuals at short-term cost to the self), often directed at non-kin. This includes many instances where the beneficiaries of the cooperative act are diffuse or unlikely to personally reciprocate. Such behaviour has been seen as an evolutionary puzzle since, if no other contingencies obtain, those who avoid the costs of cooperation will tend to have higher fitness than cooperators, and selection should thus be expected to act against it. A number of solutions to the problem of the evolutionary stability of cooperation aimed at non-kin when direct reciprocation is unlikely have been proposed. Prominent amongst these are models based on

reputation (Nowak & Sigmund, 1998; Panchanathan & Boyd, 2003), and on punishment (Boyd, Gintis, & Bowles, 2010; Boyd, Gintis, Bowles, & Richerson, 2003). In reputation models, individuals who fail to cooperate when they have the opportunity to do so risk not being chosen as interaction partners by other group members who have observed, or come to learn about, their behaviour. As long as the expected value of this future loss of interaction opportunities is sufficiently high, reputational consequences can make cooperation the fitness-maximising strategy even when the beneficiary is not likely to reciprocate. In punishment models, individuals impose fitness costs on uncooperative group members. Once again, this can be sufficient to make cooperation the fitness-maximising strategy, and the propensity to punish uncooperative behaviour can itself be favoured by selection under certain circumstances (Boyd et al., 2010). There is widespread empirical evidence that both reputational and punishment effects do occur in human cooperative behaviour. People punish non-cooperators (Fehr & Gächter, 2002), favor individuals with good reputations (Milinski,

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Semmann, & Krambeck, 2002a; Sylwester & Roberts 2010; Wedekind & Milinski, 2000), and the possibility of reputation-formation or of punishment greatly increases the amount of cooperative behaviour occurring in experimental games (Fehr & Gächter, 2002; Milinski, Semmann, & Krambeck, 2002b).

Both the reputational and the punishment-avoiding incentives to cooperate only obtain where someone else comes to know about one's behaviour. Thus, to the extent that the psychological mechanisms underlying decisions to cooperate have been shaped by the recurrent presence of reputational and punishment effects, those mechanisms ought to be highly sensitive to cues indicative that behaviour is being observed. In accordance with this prediction, there have been many demonstrations that the physical presence of other people in the room, or other non-verbal cues of proximity or visibility, produces more cooperative behaviour (Andreoni & Petrie, 2004; Burnham, 2003; Dawes, McTavish, & Shaklee, 1977; Hoffman, McCabe, Shachat, & Smith, 1994; Kurzban, 2001). A potent minimal cue of observation is a pair of eyes, and Haley and Fessler (2005) showed that merely including a stylized image of eyes on the background of the computer screen was sufficient to increase cooperation in the Dictator Game. Variations on this result have since been produced by Burnham and Hare (2007), who found a similar effect in a Public Goods Game using a robot with human-like eyes facing the participant, by Rigdon, Ishii, Watabe, and Kitayama (2009), who showed that a face-like arrangement of three dots sufficed to produce the effect in the Dictator Game, and Mifune, Hashimoto, and Yamagishi (2010), who used stimuli of the same kind as Haley and Fessler (2005) and showed that the eyes effect in the Dictator Game is only present when the beneficiary of the cooperative act is perceived to be a member of the same in-group as the co-operator.

Set against these findings, Fehr and Schneider (2010) found that including background eye images on the computer screen had no effect on the cooperative behaviour of the second player in a Trust Game. In this scenario, the participant has to decide how much money to back-transfer to another (unseen) individual who has transferred a sum to them. There was, however, a large effect of including an explicit reputational incentive by allowing interaction partners to know about each participant's previous decisions before deciding how much to transfer to them. Moreover, Lamba and Mace (2010) recently showed that being in a room with other people present had no effect on people's decisions in the Ultimatum Game when they were explicitly assured that those individuals would have no knowledge of what they decided. Although this is not directly comparable with the work of Haley and Fessler (2005), since the scenario is different, and participants were not directly faced with eye images, it does suggest that the mere presence of observers in the environment is not enough to increase cooperative

behaviour where explicit information about actual anonymity is also provided.

It is difficult, on the basis of the evidence reviewed thus far, to reach a conclusion concerning how important cues of being observed might be as an influence on human cooperative behaviour in general, not least because the external validity of laboratory game scenarios is debatable and not well established (Benz & Meier, 2008; Levitt & List, 2007). Thus, field experiments using real-world cooperative decisions may be of use, as they have often been in the history of research on cooperation (Goldberg, 1995; Keizer, Lindenberg, & Steg, 2008; Latane & Dabbs, 1975; Levine, Martinez, Brase, & Sorenson, 1994; Shotland & Heinold, 1985). Field experiments have the advantage that the behaviours under study are naturally occurring, ensuring ecological validity, and the participants do not know that they are involved in an experiment, minimising problems of experimenter demand. In a previous field experiment (Bateson, Nettle, & Roberts, 2006), we alternately displayed images of eyes and of flowers adjacent to an honesty box in which people placed their contributions to the coffee fund in our building at Newcastle University. The eye images had a large effect, with mean contributions almost three times as high in weeks when eyes were displayed than when flowers were displayed. These results suggest that eye effects can be quite strong, and appear in real-world situations.

However, our previous study was not without limitations. The setting was a coffee area close to offices, where the same relatively small group of people go most days, and the coffee fund was run by someone personally known to many of them. Thus, it is not obvious that the eyes effect will generalise to a setting where the population is more transient and the costs of not cooperating fall on strangers. Moreover, the eye images in our earlier study were displayed on a poster setting out the obligation to pay for coffee and stating the prices. This makes it impossible to distinguish between two possible interpretations of the results. The first interpretation is that the eye images simply captured attention and drew it to the vicinity of the verbal instructions more effectively than the flower images did. Verbal instructions can themselves be an effective means of increasing compliance with cooperative norms (Burgess, Clark, & Hende, 1971; Durdan, Reeder, & Hecht, 1985). On this interpretation, there is no inherent link between cues of observation and cooperation, and all that needs to be assumed is that pictures of people are particularly potent at capturing attention. The second interpretation is that there is a direct link between cues of being observed and the activation of motivation to uphold a local cooperative norm. If this interpretation is correct, then eye images should enhance cooperative behaviour even if they are not paired with verbal instructions to cooperate.

In this study, we report a second field experiment that extends the findings of our first. We had several

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