

Altruists are trusted based on non-verbal cues

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The identification of altruists based on non-verbal cues might offer a solution to the problem of subtle cheating. Previous studies have indicated that the ability to discriminate altruists from non-altruists emerges during evolution. However, behavioural differences with regard to social exchanges involving altruists and non-altruists have not been studied. We investigated differences in responses to videotaped altruists and non-altruists with the Faith Game. Participants tended to entrust real money to altruists more than to non-altruists, providing strong evidence that cognitive adaptations evolve as counter-strategies to subtle cheating.

Keywords: altruist detection; non-verbal behaviour; subtle cheating; Faith Game

1. INTRODUCTION

Altruism constitutes an important feature of human social behaviour. As a species, humans demonstrate altruistic behaviours to non-kin. Trivers (1971) indicated that altruism towards non-kin can develop in the context of reciprocity. The maintenance of reciprocal exchanges involves identifying cheaters, who receive benefits without contributing, and excluding them from social relationships. According to Trivers (1971), cheating manifests itself in two forms: gross and subtle. Subtle cheating occurs in reciprocal relationships in which one party always attempts to give less than the other party, whereas gross cheating occurs when the cheater fails to reciprocate at all. Subtle cheating represents a major problem for the maintenance of altruistic relationships in complex human societies that rely on divisions of labour. When the choice of partner is based on arbitrary criteria, exploitation becomes more probable. Because the ability to identify genuine altruists, and to engage in exchanges with only these individuals, might mitigate such potential problems, cognitive mechanisms for detecting altruists have been considered to be evolutionary advances.

Brown *et al.* (2003) used a zero-acquaintance video presentation paradigm and revealed that humans can detect altruists based on several non-verbal cues. Oda *et al.* (in press) reported the same results using improved methods. They used video clips of natural conversations between Japanese individuals as stimuli and asked viewers to rate their own and the taped targets' altruism. Viewing 30 s video clips without sound,

Japanese participants were able to correctly estimate the altruism levels of targets. These studies, conducted in different socio-cultural situations, strongly suggest that humans have a cognitive architecture for assessing altruism in others. Indeed, these studies suggest a cognitive ability to discriminate altruists from non-altruists or to estimate the altruism levels of others. However, behavioural differences among perceivers with regard to social exchanges involving altruists and non-altruists have not been studied within a zero-acquaintance video presentation paradigm. In this study, we investigated differences between responses to videotaped altruists and non-altruists as measured in terms of willingness to entrust participants with real money.

The Faith Game (Kiyonari & Yamagishi 1999), which involves one player acting as an allocator and the other as a recipient, was used in our experiment. In this game, the allocator decides how to distribute a certain sum of money, X yen, between her/himself and the other recipient. The allocator role is the same as that of the dictator in the Dictator Game (Kahneman *et al.* 1986). On the other hand, the recipient does not know how the allocator has distributed the money and is presented with two choices: to trust the allocator and accept the money that has been allocated or to refuse the allotment and receive a certain amount of money ($< X/2$ yen) from the experimenter. No interaction between allocator and recipient is permitted. Our experiment involved participants playing this Faith Game as recipients against the videotaped altruists and non-altruists as allocators. Participants could use only non-verbal information to determine trustworthiness in order to enable investigation of whether non-verbal cues affected the behaviour of viewers.

2. MATERIAL AND METHODS

(a) Stimuli

We used the same video clips of natural conversations used by Oda *et al.* (in press) as stimuli. When selecting altruists and non-altruists for videotaping, we used the self-report altruism scale employed by Johnson *et al.* (1989) whose validity was demonstrated by Brown *et al.* (2003), by showing significant differences in the number of lottery tickets shared in the Dictator Game between those who scored in the top 10th percentile and the bottom 10th percentile. We asked 69 male Japanese undergraduates (mean age: 18.7 ± 0.9 years) to indicate how often they have performed each altruistic act described in the 56 statements on a scale of 1 (never) to 5 (very often). All participants were volunteers from a class at Nagoya Institute of Technology, Japan. The participants' altruism scores were transformed into percentiles. The 90th percentile and above on the altruism scale represented altruists, while the 10th percentile and below represented non-altruists. Using these criteria, seven altruists and seven non-altruists were chosen. These 14 people were called and asked to participate in the videotaping. One altruist and three non-altruists declined to participate.

The remaining 10 individuals were brought to the laboratory one at a time. The experimenter, who was unaware of each person's altruism score, sat just beside a video camera in front of the target person, who was asked to make a self-presentation such as on his likes and dislikes. Close shots of the target (above the shoulder) in front of a white screen were videotaped. We transformed the videos into digital files and chose the first 30 s of each presentation. Then we edited the video clips into a sequence of the 10 targets' presentations. The sound was deleted to control the verbal content.

(b) Procedure

The sample was composed of 40 Japanese students (22 males and 18 females; mean age: 20.9 ± 1.5 years) recruited from Okinawa University, who were told that they would be paid the amount of money they received in the experiment. Participants were individually escorted into the laboratory. They initially played the Dictator

Game, which enabled them to imagine the allocator role in the following Faith Game as well as measuring their own altruism level. Subsequently they played the Faith Game against the video clip.

(c) Dictator game

Three coins of ¥100, an envelope labelled 'Mine' and a box were arranged on a table in the laboratory. Participants were instructed as follows: they could get the coins at their discretion. If they wanted the money, they were to put any number of coins into the envelope and place the rest into the box. The money in the box would be donated to an unknown person whom the participants would not meet. The experimenter would not know how much money they received and this money would be part of their reward.

The experimenter did not watch participants allocate the money and some coins were already in the box so that participants would think that the experimenter could not know how much they added.

(d) Faith game

After the Dictator Game, the experimenter arranged the envelope labelled 'Mine', a box labelled 'Do not entrust' and 10 envelopes labelled from 1 to 10, respectively, on a table. These numbers on the envelopes corresponded to each of the 10 videotaped targets. Three coins of ¥100 were put on each of the 10 envelopes. A laptop computer (Dell Inspiron 1525), also on the table, was used to present the stimuli. The participants were instructed as follows: they would see video clips of natural conversations involving 10 Japanese men. The videotaped targets were asked how much money they would give if they were entrusted with ¥300 to share with an unknown person, and the participants would decide whether to entrust ¥300 to each of the targets. If they entrusted the target with this money, they would share the money with each target at the discretion of the latter. If they did not entrust the target with the money, they would receive ¥100 irrespective of the decision of each target. While viewing each video, participants put ¥300 in the envelope of the designated target if they chose to trust that target with the money or they put ¥100 in the envelope written 'Mine' and the remaining ¥200 in the box if they chose not to entrust the money to the target. Participants were able to stop the video if they needed additional time to complete the experimental task. After the game, the experimenter would pay the amount of money each entrusted target decided to share as well as the money in the envelope labelled 'Mine'.

Actually we had decided the reward beforehand: if a participant trusted an altruistic target she/he gained ¥200, while she/he could not get any money when she/he trusted a non-altruist. Video clips were presented on a 15 inch LCD monitor. The order of presentation of the targets was randomized for each participant. The experimenter did not watch while participants viewed the video clips and distributed the money.

(e) Analyses

We assigned 1 point to each target for being entrusted with ¥300 and 0 points to each target when no money was entrusted. We used the mean score of the six altruists to designate the altruist faith score and that of the four non-altruists to designate the non-altruist faith score.

3. RESULTS

The mean altruist faith score was 0.65 ± 0.26 while that of the non-altruist faith score was 0.56 ± 0.31 . The faith scores of the altruists and the non-altruists were not significantly correlated with the amount of money shared by the participants in the Dictator Game (altruists: $r = 0.23$; non-altruists: $r = 0.29$). The genuine altruism of participants did not affect their faith in targets. Scores were analysed using a repeated-measures analysis of variance, with the altruism of targets (altruists versus non-altruists) as a within-subject variable and sex as a between-subjects variable. Results indicated significant effects for the altruism of targets ($F_{1,38} = 4.33$, $p < 0.05$, $\eta^2 = 0.10$), but the interaction with regard to the sex of perceivers was not significant ($F_{1,38} = 1.37$). The effect of sex was also not significant ($F_{1,38} = 1.11$). Altruistic targets were

more trusted than non-altruistic targets, irrespective of the sex of participants.

4. DISCUSSION

The result indicates that people, irrespective of sex, behave differently toward altruists and non-altruists in social exchanges involving money. This represents strong evidence for the evolution of cognitive adaptations providing counter-strategies to subtle cheating by identifying altruists and engaging in exchanges with this group exclusively. Our study, however, used only men as targets and sex differences in trust behaviour have been reported in previous studies (e.g. Buchan *et al.* 2008). Future studies should examine the effect of the sex of the target.

Oda (in press) reported that the six altruist targets exhibited more felt smiles, which are not under voluntary control and are difficult to mimic, than four non-altruist targets. Mehu *et al.* (2007) also found that Duchenne smiles (i.e. felt or 'genuine' smiles) in sharing interactions were positively affected by one measure of altruism. Participants in the current study might use this cue in deciding about placing their faith in others. Of course, we did not control other information regarding a targets' identity, physical appearance, etc. To determine whether non-verbal behaviour alone signals altruism level of the targets motion-capture technology would be needed to isolate non-verbal behaviour and create stimuli free from appearance (Brown *et al.* 2005).

Some previous studies have indicated that subjects are actually capable of predicting the cooperation rates of other participants engaged in the Prisoners' Dilemma (PD) game at a level better than chance after personal communication between the two groups of respondents (e.g. Frank *et al.* 1993; Yamagishi *et al.* 1999). However, these studies investigated the ability of social intelligence to guide estimations of the altruism of others rather than genuine altruism *per se*, because predicting the behaviour of opponents, as well as evaluating one's own altruism, greatly affects decision making in a PD situation. That is, even if a PD player were an altruist, she/he would tend to choose defection when she/he cannot expect cooperation from opponents.

Studies have reported that certain characteristics associated with non-cooperative persons can be identified by non-verbal cues (Yamagishi *et al.* 2003; Verplaetse *et al.* 2007). These results suggest that participants in our study actually identified non-altruists and chose the altruists as a result. However, both of these studies used the PD game, which is not appropriate for distinguishing altruists and non-altruists for the aforementioned reason. Moreover, such cues can be detected only from pictures of faces that are taken during the appropriate moments. Our experiment, on the other hand, revealed a significant difference in discriminating altruists from non-altruists, who were videotaped during natural conversations not related to any social exchanges. The videotaped targets did not know why they had been chosen and videotaped. The ability to identify altruists would be useful when forming new relationships involving social exchange, whereas the ability to identify cheaters might help in

maintaining an established relationship involving social exchange. The mechanisms underlying altruist detection, as identified in this study, might differ from those underlying cheater detection, as reported by Yamagishi *et al.* (2003) and Verplaetse *et al.* (2007).

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