Do Altruists Detect Altruists Easier Than Non–Altruists?

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Previous studies indicated that humans have a cognitive architecture for detecting altruism in others based on non–verbal cues. According to the perspective of 'green beard effect', green beard gene should produce recognition of the green beard in other individuals, which predicts that altruists can detect altruists easier than non–altruists. In a game situation in which perceivers respond to videotaped altruists and non–altruists, we measured the altruism of perceivers and examined the relationship between degree of altruism and ability to identify altruists. We found no significant relationship between the accuracy with which altruism levels were detected and the altruism level of perceivers.

Keywords

Introduction

Hamilton's (1964) theory of kin selection proposes that a mutation for altruism promote its own replication, by promoting altruism towards close genetic kin. In this theory, overall genetic relatedness is an indicator of the probability of an altruistic mutation being present in another individual. However, an altruistic mutation's presence could also be indicated by some cue unrelated to overall genetic relatedness. According to the perspective of 'green beard effect' (Dawkins, 1976 after Hamilton, 1964), altruism evolves irrespective of relatedness when altruists have observable characteristics (e.g., a green beard) that distinguish them from non–altruists, and other altruists, who also have this unique feature recognizing them and treat them preferentially.

The green beard perspective on human altruism predicts that people will be adapted to acquire information about others' altruism level (see review by Price, 2006). One candidate is nonverbal cues of cooperative intentions. For example, Brown, Palameta, and Moore (2003) used a zero–acquaintance video presentation paradigm and revealed that humans can detect altruists based on several non–verbal cues. Oda, Yamagata, Yabiku, and Matsumoto–Oda (2009) 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–second video clips without sound, Japanese participants were able to correctly estimate the altruism levels of targets. Moreover, Oda, Naganawa, Yamauchi, Yamagata, and Matsumoto–Oda (2009) found that people tended to trust altruists more than non–altruists in a game situation using real money. These studies, conducted in different socio–cultural situations, strongly suggest that humans have a cognitive architecture for detecting altruism in others.

The observable characteristics should not arbitrary because selection should favor cheaters who grow a deceptive green beard without the altruistic tendency. Coding the video–clips, both Brown et al. (2003) and Oda, Yamagata, et al. (2009) found that degree of felt smile (characterized by rising cheeks and narrowing of the eyes, i.e., orbicularis oculi muscle activity) was significantly correlated with altruism level of the targets. The degree of felt smile could be a "true green beard" because it is under involuntary control and difficult to mimic.

Those studies on altruism detection, however, did not focus on individual difference in perceivers' detection abilities. Green beard gene should produce recognition of the green beard in other individuals, which predicts that altruists can detect altruists easier than non–altruists. In this study we measured the altruism of perceivers and examined the relationship between degree of altruism and ability to identify altruists. Whereas Oda, Yamagata, et al. (2009) used the translated version of the self–report altruism scale developed by Johnson et al. (1989), our study employed another altruism scale, developed specifically for Japanese undergraduate students, that enabled more exact measurements of altruism.

Methods

This study was conducted as a part of the experiment described in Oda, Naganawa, et al. (2009).

(a) Stimuli

We used the same video–clips of natural conversations used by Oda, Yamagata, et al. (2009)

as stimuli. When selecting altruists and non–altruists for videotaping, we used the self–report altruism scale employed by Johnson et al. (1989). 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, 7 altruists and 7 non–altruists were chosen. These 14 people were called and asked to participate in the videotaping. One altruist and 3 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 seconds 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 comprised 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 measured their own altruism level. Subsequently they played the Faith Game against the video clip.

(c) Dictator Game

Three coins of 100 JPY, an envelope labeled '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 labeled 'Mine', a box labeled 'Do not entrust' and 10 envelopes labeled 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 JPY 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 JPY to share with an unknown person, and the participants would decide whether to entrust 300 JPY 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 JPY irrespective of the decision of each target. While viewing each video, participants put 300 JPY in the envelope of the designated target if they chose to trust that target with the money or they put 100 JPY in the envelope written 'Mine' and the remaining 200 JPY 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 labeled 'Mine'.

Actually we had decided the reward beforehand: if a participant trusted an altruistic target s/he gained 200 JPY, while s/he could not get any money when s/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) Questionnaire

A week after the Faith Game, participants completed the prosocial behavior scale (Kikuchi, 1988), which was developed to measure, on a scale of 1 (never) to 5 (very often), the frequency with which Japanese undergraduate students performed each of 20 altruistic acts described in statements. The reliability of this scale was demonstrated by high correlations between tests and re–tests after 2 months. The validity was demonstrated by data showing significant differences in the scores of participants who did and did not perform volunteer services (see Kikuchi, 1988 for details). However, the scale is flawed by its lack of differentiation between altruistic acts directed at friends versus those directed at individuals not known to the participant. We did a confirmatory factor analysis by classifying the 20 items into groups that objects are unknown people, friends and uncertain (unpublished data). In this study we used the score for the 6 items objected to uncertain people as the measure of genuine altruism. We also asked about the frequency with which participants had performed each altruistic act described in the seven

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Results

We performed signal detection analysis (Gescheider, 1997) on each participant. The values of d' (sensitivity parameter) were calculated by a hit rate (how often each participant entrusted the altruistic targets) and a false alarm rate (how often each participant entrusted the non–altruistic targets). The mean d' of the 40 participants was 0.27 ± 0.83 (males: 0.13 ± 0.73, females: 0.44 ± 0.91). One sample t–test rejected the null hypothesis that the mean of the population from which the data sample was drawn is equal to zero, $t(39) = 2.04$, $p < .05$. This supports the result of Oda, Naganawa, et al. (2009) that people can detect altruists in social exchanges. There was no significant difference between sexes, $t(38) = -1.19$, ns. The beta (bias parameter) was also calculated. Mean beta was 1.09 ± 0.43 (males: 1.15 ± 0.38, females: 1.02 ± 0.47). There was also no significant difference between males and females, $t(38) = 0.92$, ns.

The mean score for the six items contained in the prosocial behavior scale was 21.2 ± 5.3 (males: 21.0 ± 5.4, females: 21.6 ± 4.9). There was no significant difference between sexes, $t(38) = -0.35$, ns. The altruism scores for acts involving unfamiliar people were significantly correlated with neither the d' ($r = -.03$) nor the beta ($r = -.20$). The mean score for the seven statements with the greatest effect sizes with regard to distinguishing the 6 target altruists from the 4 target non–altruists was 22.9 ± 4.8 (males: 22.0 ± 4.7, females: 24.1 ± 4.7). There was no significant difference between sexes, $t(38) = -1.4$, ns. The altruism scores discriminating the altruists and non–altruists were significantly correlated with neither the d' ($r = -.03$) nor the beta ($r = -.22$). These results indicate that the genuine altruism of participants did not affect their detection accuracy.

Discussion

We found no significant relationship between the accuracy with which altruism levels were detected and the altruism level of perceivers and, therefore, cannot conclude that altruists recognize each other and treat each other preferentially. That is, our study does not provide evidence for the green beard effect. However, this absence of affirmative evidence does not constitute evidence for denying the green beard effect with regard to human altruism because there are some other cues of cooperativeness (e.g., reputation).

A possible reason of the lack of correlation is that altruist–detection is also important for non–altruists. While the non–altruist in our study is not the same as cheaters, it is plausible that they tend to cheat more than the altruists. While degree of felt smile could be a 'green beard', this observable characteristic is also a sign of dupe for cheaters. If altruists are not preferentially identified by other altruists, they are in greater danger of exploitation by non–altruists or cheaters, suggesting that altruists develop counter–strategies for dealing with exploitation. It is possible that altruists detect cheaters better than do non–altruists. Although several kinds of cognitive biases for cheater detection and recognition have been reported (e.g., Cosmides, 1989; Oda, 1997; Oda & Nakajima, 2009), the altruism of the perceivers has not been investigated and future studies should address this issue.

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