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Perception of Human Face Does Not Induce Cooperation in Darkness

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Many studies showed that a concern to maintaining good reputation induces cooperation. Haley and Fessler (2005) found that an illustration of a human face makes people cooperative in the dictator game. In comparison with the past studies, our experimental results suggest that the observer effect is moderated by a particular contextual variable – darkness. We found that the illustration of a human face did not increase an amount of donation in the dictator game when it was presented in a dark sound proof room. In darkness, an observer often has a hard time in monitoring an actor even when an actor can see an observer. Hence, we conjecture that the human face-like stimuli does not increase a concern to reputation when presented in darkness, because the risk of an observer to identify the actor is low. Current experimental results show a possibility that a system that makes people cooperative in response to cues indicating the presence of the others is triggered only in a specific condition.

Keywords
reputation, dictator game, cooperation, face, darkness

Introduction

One important feature characterizing the human beings is its capacity of establishing cooperation even with strangers who are unlikely to interact with in future. It is argued that the concept of reputation is crucial to explain the evolution of cooperation that cannot be explained by either kinship or reciprocal altruism (Nowak & Sigmund, 1998). In many human societies, those who cheat the others receive bad reputation and are avoided as an exchange partner. It is thus vital to keep good reputation in a group for maintaining the benefit of mutually cooperative relationships. To maintain the good reputation, people must not behave uncooperatively especially when being monitored by others. So, it is expected that human is very sensitive to the cues of existence of observers and when there are such cues people are expected to behave altruistically. Haley and Fesslar (2005) first experimentally demonstrated that the participants became more altruistic in the dictator game when there was a face stimulus in front of them. They concluded that the face stimulus was perceived as an in-group observer and that led the participants to behave more altruistically in order to achieve the good reputation in their group. In this paper, we call this phenomenon the observer effect. Many experimental studies successfully replicated this effect (Bateson, Nettle, & Roberts, 2006; Oda, Niwa, Honma, & Hiraishi, 2011). The observer effect has been assumed by researchers to be a robust effect that is produced by automatic and unconscious psychological processes. For example, Bateson et al. (2006) wrote "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 behavior." Rigdon, Ishii, Watabe, and Kitayama (2009) also wrote "this process might be so fully ingrained into unconscious social cognition that it could be set off by a weak stimulus that carries no realistic basis to a pair of human eyes."

In this study, we argue this effect may depend on a particular contextual variable – darkness. Zhong, Bohns, and Gino (2010) showed that decision in the economic game is influenced by darkness of the room and that the participants became more uncooperative in a dark room. They argued that the darkness of a room increases the participant's subjective sense of anonymity, because it is generally difficult for an observer to identify the others in the dark. In other words, necessity of cooperation for achieving a good reputation is not so high in the dark. Darkness may also moderate the observer effect with the same reason. Under the darkness, being able to watch somebody's face does not necessarily mean that the person can also recognize the identity of others (e.g., an actor standing in the spotlight on a stage in a theater.) In this paper, we report the results of two laboratory experiments that examined the effect of a face stimulus on the one-shot dictator game in a dark sound proof room.

Experiment 1

Method

(i) Participants

Participants were 40 undergraduates at Sophia University in Japan (11 male and 29 female;

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mean age, 19.28 years) who were registered on a participant pool. When being recruited over an email or a telephone, monetary reward was emphasized. Half of the participants were randomly assigned to face condition, and half were assigned to the neutral condition.

(ii) Reward

Lottery was used as a reward of the dictator game. Participants received 10 pieces of lotteries. Expected value of each lottery was 100 JPY (= 0.9 EUR) as each lottery had a 1 in 50 chance of winning 5,000 JPY (=45 EUR). Participants could allocate as many pieces of lotteries as they want to an anonymous receiver.

(iii) Stimulus

While participants were reading the instruction on the PC screen for about 10-15 minutes, an illustration was presented as a background of the instruction. In the face condition, the same face stimulus as the illustration used in Haley and Fessler (2005) was displayed (Figure 1a). In the neutral condition, in order to make the energy of stimulus even, an illustration of a butterfly was made using decomposed parts of the face illustration (Figure 1b). Size of the face stimulus and neutral stimulus was 14°×27° and 13°×17°, respectively.

(iv) Procedure

Upon arrival, participants were led into a dark sound-proof room and signed the consent form. Only one participant was in the room on each session. The title slide had been displayed on a desktop PC screen until the experimenter left the room. Participants were orally instructed that the lottery was used as a reward and all the following instruction would be displayed on the PC screen. The experimenter put pieces of lotteries on the desk and left the room. Participants then read the instruction at one's own pace and played the dictator game as a dictator. PC monitor was the only light source in the room while participants were reading the instructions. It was instructed that the participants would be playing the dictator game with an unknown student from the same university who was planned to participate in the experiment later. It was emphasized that his payment was solely determined by the dictator's decision. Anonymity of decision was also emphasized.

After reading the instructions, participants put as many lotteries as they were willing to give to the receiver into an envelope. They then left the sealed-envelope into a transparent box which was filled with similar sealed-envelopes in order to assure them that the experimenter could not identify their decision anymore. The ID number of the participant was written on the envelope with a special ink which only becomes visible under a black light. At the end, participants called out the experimenter and responded to a post questionnaire.

(a) Face stimulus

(b) Neutral Stimulus

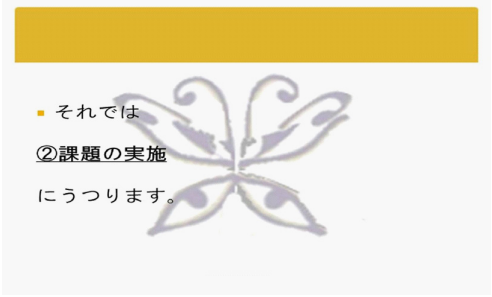


Figure 1. Stimulus presented in the Experiment 1.

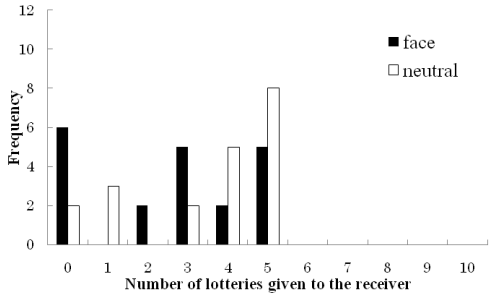
Result

An amount of allocation given to the receiver was compared between the face and neutral conditions (Figure 2a). Independent sample t-test revealed no significant effect of displayed stimulus (face condition: M = 2.60, SD = 1.98; neutral condition: M = 3.45, SD = 1.82), t(38) = 1.41, p = .166.

Discussion

The observer effect was not found in the experiment 1. Though not significant, there was even a tendency that participants allocated less lottery in the face condition. One possible explanation is that the participants in our experiment were not sincere, because lottery was used as a payment. However, extra analyses suggested otherwise. In the post questionnaire, we asked the following three questions using 10 point Likert scale: Were you convinced: of anonymity of your decision?; of existence of the other player?; that the decision involved real money? (1 = wasn't convinced at all, 10 = was convinced very much). One-sample t-tests revealed that responses to all the questions were significantly higher than the midpoint of the scale, suggesting that the participants were attending the experiment seriously. We also measured Social Value Orientation (SVO; Van Lange, Otten, De Bruin, & Joireman, 1997) when recruiting the participants in a classroom. This scale is known to be significantly correlated with responses in various economic games such as the trust game (Van den Bos, Van Dijk, Westenberg, Rombouts, & Crone, 2009). In Experiment 1, 20 participants were classified as cooperator, 14 participants as egoist and 3 participants as unclassified. 2×2 ANOVA (cooperators vs. egoists × face vs. neutral)

(a) Allocations in Experiment 1



(b) Allocations in Experiment 2

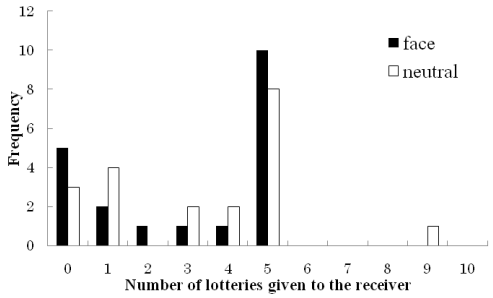


Figure 2. Frequencies of allocations in the dictator game.

showed that cooperators (M = 3.65, SD = 1.79) were more generous than egoists (M = 1.93, SD = 1.98), and the main effect of social value orientation was significant, F (1, 30) = 6.96, p = .013, η^2 = .19. The main effect of the stimulus, F (1, 30) = 1.48, p = .234, η^2 = .05, nor the interaction effect, F (1, 30) = 0.57, p = .456, η^2 = .02, was significant. This result also suggests that it was unlikely that the participants were making decisions randomly.

Except for the darkness of the room, there were two more major differences that may have influenced the experimental result. First, length of the stimulus presentation time was much longer in our Experiment 1 than Harley and Fessler (2005). We presented the stimulus as a background of the instruction for 10-15 minutes, but they presented the stimulus as a desktop screen until the instruction was displayed on the PC screen. Fehr and Schneider (2009) who reported the observer effect was not found in the trust game also presented stimulus as a background of the instruction in the same manner as we did. Second, we made neutral stimulus from parts of the face stimulus and we accidentally used eye parts as the hind wing of the butterfly. If people are especially sensitive to the stimulus resembling human eyes, our butterfly illustration could have caused the same effect as the face illustration.

The experiment 2 is identical with the experiment 1 except for two changes. First, instead of an illustration of the butterfly, we used a white blank background in the neutral condition. Second, like Harley and Fessler (2005), we showed a stimulus as a desktop screen so that the participants were exposed to the illustration only for about 3-5 minutes.

Experiment 2

Method

(i) Participants

Participants were 40 undergraduates at Sophia University in Japan (15 male and 25 female; mean age, 19.23). Half of the participants were randomly assigned to face condition, and half were assigned to the neutral condition.

Result

Independent sample t-test revealed no significant effect of displayed stimulus (face condition: M = 3.05, SD = 2.24; neutral condition: M = 3.35, SD = 2.41; Figure 2b), t(38) = 0.40, p = .686.

General Discussion

We tested the effect of a face stimulus in the dictator game as a replication of Haley and Fessler (2005). In both experiment 1 and 2, the observer effect was not found. Analyses of the post questionnaire and SVO in the experiment 2 replicated the same results as in the experiment 1. These data illustrate that we succeeded in replicating the standard dictator game experiments. Though we didn't directly checked the effect of the face stimulus in lighted place in the current experiment, experimental results suggest that the face stimulus may lose its influence on decisions in the dictator game when presented in darkness.

One possibility is that necessity of maintaining good reputation is low in the darkness. As we mentioned in the introduction, Zhong, Bohns, and Gino (2010) suggested that darkness increases subjective anonymity because it is impossible to see another person's behavior in the darkness. In other words, in darkness, people do not need to behave cooperatively even if there is an observer, because they are unlikely to be identified by that person. This may explain our results that the observer effect did not occur in darkness.

Another possibility is that, in darkness, a face may be perceived as an antagonistic enemy out-group member rather than an in-group observer. If that is the case, it is predicted that males allocate less than females in the face condition, because according to the male warrior hypothesis (Van Vugt, De Cremer, & Janssen, 2007), males need to be more aggressive against an out-group enemy than females. Further analyses support this possibility. We collapsed the data of the two experiments into two conditions – whether a face stimulus was presented (FACE condition) or not

(NO-FACE condition). In the FACE condition, independent sample t-test revealed that males allocated significantly less than females (males: M = 1.36, SD = 1.69; females: M = 3.38, SD = 1.99), $t(38) = 2.97$, $p = .005$. On the other hand, in the NO-FACE condition, independent sample t-test revealed that there was no significant effect of sex (males: M = 2.93, SD = 2.74; females: M = 3.68, SD = 1.63), $t(38) = 1.09$, $p = .284$

The observer effect was repeatedly replicated by many researchers (Oda, Niwa, Honma, & Hiraishi, 2011; Rigdon, Ishii, Watabe, & Kitayama, 2009) and this may have led the researchers to believe this effect to be automatic and strong which occurs across the board. Our study suggests that this effect is probably context-dependent and future research needs to rigorously specify factors and situations that trigger the system which is in charge of the observer effect.

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