

# The Association Between the Level of General Trust and the Judgment Accuracy of Group Members' Cooperation in a Social Dilemma

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The current study sought to examine the association between the level of general trust and the judgment accuracy of others' cooperativeness. Based on data collected from 107 female first-year undergraduate students, we demonstrated that a high level of general trust was associated with a high level of judgment accuracy of group members' cooperation in a social dilemma game. Additional analysis suggested that the association was present even when the judgment accuracy was divided into hit rate (i.e., the rate of correct judgment on the cooperator as a cooperative) and correct rejection rate (i.e., the rate of correct judgment on the non-cooperator as a non-cooperative) by controlling the participants' judgment bias, Big Five personality traits, and the proportion of cooperators in the group. These results are in accordance with previous studies insofar as they suggest that high trusters are more skilled at discerning others' trustworthiness. The current study adds to the evidence that high trusters have increased cognitive skills and supports Yamagishi's emancipation theory of trust.

## Keywords

trust, cooperativeness, judgment accuracy, social dilemma, collectivistic society

## Introduction

Trusting others is not the same as being gullible (Yamagishi, 2011). This may be contrary to the general understanding of trustful persons, especially among Japanese people. However, empirical studies have demonstrated that high trusters are more sensitive to trust-relevant information than low trusters (e.g., Yamagishi et al., 1999) and that the former can discern or predict others'

behavior more accurately than can low trusters (e.g., Carter & Weber, 2010; Kikuchi et al., 1997). Specifically, Kikuchi et al. (1997) demonstrated that high trusters, as determined by Yamagishi and Yamagishi's (1994) general trust scale, were better able to predict who had made a cooperative choice in a prisoner's dilemma game after a brief face-to-face conversation. Subsequent research using Japanese and American university student samples has also demonstrated that high trusters can judge others' altruistic propensity through non-verbal cues after watching five-second video clips of Japanese target persons (Shinada et al., 2011). These findings suggest that high trusters have high levels of discernment, providing support for Yamagishi's (2011) "emancipation theory of trust."

According to the emancipation theory of trust, having a high level of general trust, which is regarded as the default expectation of other people's trustworthiness (Yamagishi & Yamagishi, 1994), encourages people to break free from closely knit social relationships and form new relationships with others. It is no surprise that trusting others plays an important role in society; if one cannot trust others, it would be difficult to establish better relationships. However, there is always risk involved in trust: one who unconditionally trusts others has an increased chance of being betrayed. Therefore, having *only* a high level of general trust is often hazardous. One must have both the disposition to trust others and the ability to select the right individuals with whom to interact. The results of the studies presented above seem to support the validity of Yamagishi's emancipation theory of trust, especially with regard to the "investment model of trust" (Yamagishi, 2011), which conceives general trust as being founded on social intelligence. However, further research is needed to establish the validity of his emancipation theory.

The purpose of this study is to provide further evidence to support Yamagishi's emancipation theory of trust. A study conducted by Kikuchi et al. (1997) focused on the judgment accuracy of cooperative disposition in a prisoner's dilemma game. In a study by Shinada et al. (2011), altruistic tendency in a dictator game was deemed to be a disposition to judge cooperativeness. Both findings were consistent in that high trusters are more skilled at discerning others' trustworthiness. However, both studies were based on "bilateral" games, wherein the interaction was basically limited to two persons. The current study uses an n-person social dilemma to examine whether the level of general trust and judgment accuracy of others' cooperativeness are correlated—a research topic that is highly applicable to everyday life. Specifically, we focused on the general disposition for forming cooperation in a social dilemma. Based on the argument that judgment accuracy of others' cooperativeness enables a high level of trust (Yamagishi, 2011), we observed an association between general trust and the skill to discern others' cooperativeness. Therefore, we hypothesized that the level of general trust and the judgment accuracy of group

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members' cooperation in a social dilemma would be positively associated.

## Methods

### Participants

One hundred and seven female Japanese first-year undergraduates (mean age = 18.15,  $SD = 0.41$ ) participated in this study. The participants belonged to the department of psychology and were recruited from a lecture on social psychology. The experiment was conducted in the latter half of June, about three months after they entered university. We chose this period so that the participants would know each other to some extent, but not too well; under such conditions, the judgment accuracy of others' cooperation is considered relevant.

### Measures

Before the experiment, participants completed a brief questionnaire. To measure their level of general trust, we utilized the general trust scale (Yamagishi et al., 2015, originally developed by Yamagishi and Yamagishi, 1994). It includes items such as "Generally, I trust others" and "Most people are basically honest." High scorers are considered to have, by default, high expectations regarding human benevolence. Considering the possibility that general trust might be associated with the Big Five personality traits (e.g., Evans & Revelle, 2008), we used the Ten-Item Personality Inventory (TIPI-J; Oshio et al., 2012) to measure the participants' Big Five personality scores. Items were rated on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).

After completing the general trust scale and the TIPI-J, participants were asked to create their own ID number (consisting of five figures) to ensure anonymity. The experimenter emphasized to the participants that the raw data were assessed using only the ID number as a personal reference. Although this study was conducted as part of a lecture, monetary rewards were also used to incentivize participants. It was then emphasized that 10% of the participants were given the money determined by their actual decisions in the one-shot social dilemma game (SDG) experiment (through a QUO card). It was also emphasized that the better the performance in the judgment task, the more likely the participant was to receive monetary rewards. By doing so, we attempted to increase the participants' motivation to engage in the task.

### One-shot SDG experiment

The participants were first divided into eight groups consisting of 11–16 members each<sup>1</sup>. They were informed that their decision to participate was voluntary and that they could freely stop participating at any point in the study. All the students who attended the lecture agreed to participate<sup>2</sup>. At this point, the experimenter distributed the instruction sheet to the participants. Using the screen and instruction sheet, general rules of SDG on how to record their decisions (they answered through a Google

form using their own devices such as smartphones) were explained in detail. After the experimenter confirmed that all participants understood these rules, each participant was given 500 JPY (approximately 5 USD) and asked to decide how much out of that money they wanted to contribute to their group. Participants were told that the total amount of money contributed to the group would be doubled by an experimenter and divided equally among group members. No feedback on their decision was given to participants.

### Judgment task

After the participants decided on the amount they wanted to contribute, they were escorted to a space with a large table where all group members could see each other and were asked to perform the judgment task. "Number cards" prepared in advance by the experiment, with the numbers 1–16 written on them, were placed on the table. Participants drew one card at random and sat in a chair corresponding to the card number; the arrangement of tables and chairs allowed all participants to know each other's number. In the judgment task, participants were asked to determine whether each group member other than herself had made a substantial contribution (i.e., whether they were a cooperator or non-cooperator). A person who contributed 250 JPY or more (out of 500) was defined as a "cooperator," while a person who contributed less than 250 JPY was defined as a "non-cooperator." In our analysis shown below, the percentage of correct judgment, obtained by simply dividing the number of times the participants correctly judged each group member's behavior by the number of people in her group excluding her, was used as the mean score of judgment accuracy. For more detailed examination, we also created two more indices assessing judgment accuracy: *hit rates* and *correct rejection rates*. Hit rate was calculated by dividing the number of times that the participant correctly judged the cooperator as a cooperative by the number of cooperators in her group excluding herself. Similarly, for each participant, the correct rejection rate was calculated by dividing the number of times that the participant correctly judged non-cooperators as non-cooperatives by the number of non-cooperators in her group excluding herself. We used these two rates to examine the association between the level of general trust and judgment accuracy.

## Results

As shown in Table 1, the mean amount contributed in the SDG was 253.27 JPY ( $SD = 154.99$ ). The mean rate of judgment accuracy was 0.55, the mean hit rate was 0.53, and the mean correct rejection rate was 0.52. As the results of zero-order correlation<sup>3</sup> show, the level of general trust was significantly positively correlated with judgment accuracy ( $r = .22, p < .05, 95\% \text{ CI } [.03, .39]$ ) and positively correlated with hit rate ( $r = .21, p < .05, 95\% \text{ CI } [.03, .39]$ ), although non-significant correlation was observed with correct rejection rate ( $r = -.04$ ).

The zero-order correlation may be influenced by the judgment bias of the participants and the number of cooperators in her group. Therefore, we created

<sup>1</sup> These groups were originally formed for an orientation seminar (an official event of the university), and the group members spent three days and two nights together in May.

<sup>2</sup> This may be because participants were informed about the experiment a week prior.

<sup>3</sup> The zero-order correlation coefficients among related variables are summarized in Table S1 (Supplementary Material).

Table 1. Descriptive statistics and partial correlation coefficients among related variables.

	<i>M (SD)</i>	1	2	3	4	5
1. Amount contributed in SDG	253.27 (154.99)	—				
2. Judgment accuracy	0.55 (0.14)	-.05 [-.25, .15]	—			
3. Hit rate	0.53 (0.35)	-.10 [-.29, .10]	.77** [.68, .84]	—		
4. Correct rejection rate	0.52 (0.33)	-.10 [-.29, .10]	.74** [.63, .82]	.77** [.67, .84]	—	
5. General trust	3.79 (1.02)	.09 [-.11, .28]	.24* [.04, .41]	.22* [.02, .40]	.22* [.03, .40]	—

Note. Partial correlation coefficients with 95% confidence intervals controlling for the participants' judgment bias, Big Five personality traits, and the proportion of cooperators in the group are shown. \*\* $p < .01$ . \* $p < .05$ .

two indicators as control variables: *judgment bias* and *proportion of cooperators in the group*. The judgment bias was calculated by simply dividing the number of times the participant judged each member of the group as a cooperator by the number of group members excluding herself. The proportion of cooperators in the group was also simply calculated by dividing the actual number of cooperators in a participant's group by the number of group members excluding herself. We then examined the partial correlation by controlling these two variables, along with the participant's Big Five personality traits (see, Table 1), and found that the level of general trust was significantly positively correlated with judgment accuracy ( $r = .24, p < .05, 95\% \text{ CI } [.04, .41]$ ), positively correlated with hit rate ( $r = .22, p < .05, 95\% \text{ CI } [.02, .40]$ ), and positively correlated with correct rejection rate ( $r = .22, p < .05, 95\% \text{ CI } [.03, .40]$ )<sup>4</sup>.

**Discussion**

Our results showed evidence of a correlation between the level of the participants' general trust and their judgment accuracy of group members' cooperative behavior in a social dilemma. This association was present even if the judgment accuracy was divided into hit rate and correct rejection rate when controlling for the participants' judgment bias, Big Five personality traits, and the proportion of cooperators in the group. This finding is in accordance with previous studies (e.g., Kikuchi et al., 1997), which found that high trusters were more skilled in discerning others' trustworthiness. In the current study, we did not find any association between the general cooperative disposition (e.g., amount contributed in the SDG or agreeableness in the Big Five personality traits) and judgment accuracy. This finding is not inconsistent with Yamagishi's emancipation theory of trust. However, how the general cooperative disposition is associated with judgment accuracy is an interesting and potentially fruitful topic for future research.

Based on Yamagishi's original theory of trust, it was argued that having a high level of general trust does not

play an adaptive role in collectivistic societies such as Japan, which are characterized by the "assurance" of security in long-lasting and stable relationships (Hashimoto & Yamagishi, 2016; Yamagishi & Hashimoto, 2016). However, traditionally collectivistic societies are gradually transitioning to more individualistic societies, which are characterized by an open pursuit of opportunities outside secure and stable relationships. In this sense, it is important to consider socio-cultural environmental factors in the debate on trust and cooperator detection. Considering this period of transition, trusting others could be more important now than it was about 25 years ago, when the emancipation theory of trust was proposed. In today's global society, it is better to maintain a high level of general trust than to distrust others by default.

The current study focused on examining judgment accuracy in everyday situations and face-to-face settings; therefore, we had to rely on the participants' actual decision making in this experiment. As a result, there exists a limitation in terms of experimental rigor. Specifically, it should be noted that the inconsistent number of people and inconsistent proportion of cooperators in each group are potentially problematic. It will be necessary to replicate this experiment and confirm the robustness of our findings in more rigorous ways in future investigations.

**Supplementary Material**

Electronic supplementary materials are available online.

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<sup>4</sup> Based on Yamagishi's emancipation theory, general trust can be considered to increase only when individuals have a discerning ability. However, it seems appropriate to analyze the effect of trust on judgement accuracy by conducting regression analysis. Since the theory we relied on is a "co-evolutionary model," both of these points may be considered problematic. In this manuscript, we show the correlational evidence only, but the results of exploratory regression analyses that we conducted are presented in Tables S2 and S3.

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