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RELATION BETWEEN ATTITUDINAL TRUST AND BEHAVIORAL TRUST: AN EXPLORATORY STUDY

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ABSTRACT

Previous studies have reported the low predictability of attitudinal trust measures for behavioral trust outcomes. This study argues that there has been a mismatch of the trust construct by using social trust attitude measures to predict materialistic trust behavioral outcomes. Through exploratory pilot experiments, distributional preference measures were found to be related to the materialistic trust decision in the game but not to the social trust decision in the scenario. These findings can shed light on the validity issue of trust measures in future research.

Trust is essential for us to survive in modern societies as we are living in highly complex and interdependent societies. However, its scientific definition varies across academic fields. In psychology, trust is defined as one's willingness to be vulnerable to another based on positive expectation on the other (Colquitt, Scott, & LePine, 2007). In other fields like behavioral economics, trust is defined as "one's voluntary transfer of a good or favor to someone else, with future reciprocation expected but not guaranteed" (Gunnthorsdottir, McCabe, & Smith, 2002, p. 50).

Reviewing scattered definitions of trust in the literature, there are almost always two common components: (1) voluntary risk-taking to make oneself vulnerable to others and (2) expectation of the other's reciprocal response or trustworthiness. Among the trust measures that signal these features, the two most frequently used methods are the questionnaire and the experiment. Trust questionnaires focus on attitudinal trust about one's personality or disposition; trust experiments concentrate on an individual's trust judgment or behavior by using decision tasks, often in the form of an experimental game. As these methods were used instrumentally and sporadically in past studies, there are a few studies that directly explore the relation between attitudinal trust and behavioral trust (Ben-Ner & Halldorsson, 2010; Fehr, 2009), and those studies yielded mixed findings.

This article aims to find the reason behind the confusing results of previous studies. Based on the review regarding (1) the construct of trust "in" the trust measures and (2) the types of trust measures as a methodological "tool," a new conceptual frame for categorizing trust measures is suggested. This article argues that attitude scales and behavioral tasks need to be properly employed in accordance with the trust construct that each research focuses on. This argument is partially supported by exploratory pilot studies.

TRUST CONSTRUCT MISMATCH BETWEEN TRUST MEASURES

Trust scales examine attitudinal trust. Rotter's *Interpersonal Trust Scale* (1967) measures an individual's general trust toward various groups of people and society (e.g., "It is safe to believe that in spite of what people say most people are primarily interested in their own welfare"). However, trust experiments tend to concentrate on behavioral trust. For example, in *the investment game* (Berg, Dickhaut, & McCabe, 1995), the sender's investment multiplied and transferred to a receiver is regarded as trust, and the receiver's positive return to the sender indicates reciprocity (Camerer, 2003).

Experimental findings have shown somewhat unclear relations between these trust measures though. Glaeser et al. (2000) found that there are weak and mostly insignificant relations between the attitudinal trust measured by surveys and the behavioral trust measured by the investment game. Holm and Danielson (2005) found that trust survey answers predicted the amount of money invested in Sweden but not in Tanzania. Likewise, Ahmed and Salas (2009), examining the five countries of Chile, Colombia, India, Mexico, and Sweden, reported that surveyed trust has predictability for trust behavior in some countries but not in others.

As to the mixed results between surveys and games on trust, Fehr (2009) pointed out that trust questionnaires simultaneously measure expectancies on others, betrayal aversion, and risk preferences; however, the three factors operate separately and in a distinguishable manner to impact trust behavior in games. Similarly, Ben-Ner and Halldorsson (2010) argued that the investment game is a good trust measure, but it only examines a certain dimension of the trust construct. Based on previous studies, we may infer that trust behavior in an economic game might not reflect all aspects of trust. Thus, it is necessary to clarify trust in terms of its construct and its instrument. Table 1 suggests a conceptual frame to categorize four trust-related measurements. The problem found in previous studies may be caused by the mismatch between the social trust attitude measured by surveys (**A**) and the materialistic trust behavior measured by games (**D**). Hence, this article proposes that a response in the social trust survey (**A**) should correspond to a choice in the social trust task (**C**) and that a response in the materialistic trust survey (**B**) should correspond to a decision in the economic trust task (**D**).

Table 1. Conceptual Categorization for Trust Measure and Construct

		Trust Measures	
		Survey	Experiment
Trust	Social	A Social Trust Attitude	C Social Trust Behavior
Construct	Materialistic	B Materialistic Trust Attitude	D Materialistic Trust Behavior

TWO MISSING TRUST MEASURES

The measure for materialistic trust attitude (**B**) or the experimental task to examine social trust behavior (**C**) has received relatively little attention. There are some scales to help infer the relation between materialistic trust attitude and behavior. The *social value orientation* (SVO) scale categorizes personal tendencies for resource allocation (Van Lange, De Bruin, Otten, & Joireman, 1997). For example, the prosocial type is motivated to maximize collective gains, but the individualistic type cares about personal profits and ignores the others. The *dictator game* (DG) (Forsythe, Horowitz, Savin, & Sefton, 1994) also examines one's distributional tendency because the dictator in the game is asked to split a given endowment between oneself (distributor) and the other (recipient). The *ultimatum game* (UG) (Güth, Schmittberger, & Schwarze, 1982) is like the DG except that the recipient in the UG can disable the distributor's decision by rejecting the offer. Although the distributional preference measures do not specifically examine materialistic *trust* attitude, some previous studies found that these measures are related to trust behavior. For instance, prosocial types are more trusting and trustworthy than the other SVO types (Derks, Lee, & Krabbendam, 2014), and there is a significant relationship between the decision in the DG and the decision in the investment game (Holm & Danielson, 2005).

As an experimental task that can measure social trust (**C**), the scenario method may be suitable but it is rarely used in research. A scenario is a story describing plausible futures to investigate systematic factors that influence perceptions, judgments, decisions, etc. (Selin, 2006). According to *the imagined contact hypothesis* (Crisp & Turner, 2009), scenarios could investigate the influence of implicit and subtle social cues by asking people to imagine social conditions without real interpersonal contact. Imagined contacts could impact both attitudes and intentions because detailed schemes likely induce vivid and available behavioral scripts in people (Miles & Crisp, 2013). Goto (1996) used scenarios to study trust and discovered that one's dispositional trust predicted trust behaviors in the scenario varied by uncertainty levels, social distances among people, and the amount of money transacted.

If the construct mismatch between A and D caused earlier findings, it would be possible to test the relation between **B** and **C** in reverse. As there is no attitude measure developed for materialistic trust yet, other scales that examine interpersonal materialistic attitudes, as reviewed above, will be used alternatively for an exploratory purpose. Hypothesis 1 is as below:

H1. Materialistic distributional preferences would be little related to the trust decision in the scenario describing social trust situations.

Because most experimental games are designed to have measurable economic outcomes, players tend to behave strategically and materialistically more than they consider social conditions and interpersonal relations. To see the possibility of the relations between **B** and **D**, whether one's distributional preferences are closely related to trust decisions in games will be examined. Hypothesis 2 is as follows:

H2. Materialistic distributional preferences would be strongly related to the trust decision in the game that focuses on economic outcomes.

STUDY DESIGN

Subject

The experiment was conducted in a university in the northwestern part of the United States. 260 students (163 females and 97 males) were recruited via an online subject pool system managed by the psychology department. Upon arrival, participants entered one of eight rooms in the laboratory where each room had one computer. After informed consent was obtained from participants, they performed the experiment individually using the personal computer through the website *Qualtrics.com*. After the experiment, the participants received course credit for participating.

Procedure

Individuals' materialistic attitudes were measured by the SVO (Murphy, Ackermann, & Handgraaf, 2011), the DG, and the UG. To use the last two games as a substitute for the materialistic attitudinal measure, the DG and UG were modified into a questionnaire in which respondents were given several questions on their distributive preference to divide the endowed \$100 as a distributor or as a recipient (See Appendix A for details).

After completing the surveys, participants were randomly assigned to a scenario task or a game task. For the game task, the centipede game was employed (McKelvey & Palfrey, 1992). It is a sequential game where two parties play the role of a trustor and a trustee alternately. The first player decides to continue or terminate the game. If the game is continued, then the second player decides whether to continue or end the game. There could be 10 decision stages in the game. The total payoffs were doubled each round, and the player terminating the game took four-fifths of the prize. The other player received the rest (See Appendix B for details). Thus, continuing the game is considered trusting behavior since it guarantees an increase in the collective payoffs, but the risk of being betrayed by the other also increases. In contrast, stopping the game is considered distrusting or betrayal because the decision assures the larger portion of the prize, but the chance to proliferate the entire reward is lost because the game ends. Therefore, the number of passes made during the game can indicate one's material trust level.

For the scenario task, two stories were used to see trust behavior in the social context. One story is about a person who looks for a private seller to buy a used car from within the limited budget. Another story is about a person who is advised to replace a car water pump by a car mechanic. Based on the previously demonstrated effect of imagined contacts (Crisp & Turner, 2009; Miles & Crisp, 2013), scenarios were created to place participants in more realistic decision settings where social and situational factors come into play. Buying a used car from a seller sounds more realistic and empathetic to most people than playing a monetary game with a stranger. Circumstantial information in the scenario can have readers deliberate on other undescribed implicit factors (Freund & Keil, 2013), search and process contextual information broadly (Ku,

Kuo, Yang, & Chung, 2013), and make empathetic and realistic decisions. For example, while reading the scenario, participants could remember their past experience with a dishonest mechanic or think about the risk of costly problems hidden in a used car. Then, those considerations may affect the final decisions. Participants randomly read one of the two stories and are asked to answer the question "Would you purchase the car?" or "Would you replace the water pump?" on a 6-point Likert scale.

RESULT

The analysis was conducted with 130 students (81 females and 49 males) in the scenario condition and 130 students (82 females and 48 males) in the game condition. Their mean age was 20.38 ($SD = 1.82$).

In the scenarios, the trust level to the car dealer or the car mechanic was measured using the 6-point scale, from "Definitely Not" (1) to "Definitely Yes" (6). The mean difference between the two scenarios was not significant, $t(125.82) = 0.625, p = .533$. All scores were combined for analysis. H1 predicted that one's materialistic attitude is little related to one's social trust decision in the scenario. The equivalence test (Lakens, 2017) was conducted to test H1. It follows the two one-sided tests (TOST) procedure (Schuirmann, 1987) in which the null hypothesis states the presence of an effect and the alternative hypothesis states the absence of an effect; the purpose of the equivalence test is the opposite of the typical null hypothesis significance test (NHST). If the NHST is *not significant* (the 95% CI includes zero) but the equivalence TOST is *significant* (the 90% CI falls within equivalence bounds), it can be concluded that scores are statistically equivalent or that a treatment effect is too small to be meaningful (Lakens, 2017, *p.* 356-357). To set the equivalence bounds, a minimal effect size was computed by using the *G*Power* sensitivity analysis (Faul, Erdfelder, Lang, & Buchner, 2007), which satisfies 80% power ($1 - \beta$) and 5% type I error (α) with a given sample size (N). Then, analyses were performed with *R* 3.3.3 using the *TOSTER* package. Table 2 displays the major findings. Spearman's correlation between the SVO and the scenario response was not significant in the NHST, $r(130) = .063, p = .475$, but significant in the TOST, $r(130) = .063, p = .020$. It suggests that the correlation is not significantly different from zero and is statistically equivalent to zero with equivalence bounds of -0.24 and 0.24 . All the other tests for Pearson's correlations between the scores from the DG/UG questionnaire and the scenario responses yielded the same conclusion, implying no statistically meaningful association between materialistic attitude measures and trust decisions in the scenario (See Table 2). Finally, independent group means were compared for major SVO types (34 individualistic types with $M = 4.29$ and $SD = 1.268$, and 94 prosocial types with $M = 4.36$ and $SD = 1.125$) to find any significant group difference or equivalence in scenario outcomes. Equivalence bounds for this test were computed based on 80% power, $\alpha = .05$, and $N = 128$ ($n_1 = 34, n_2 = 94$). Because of unequal sample sizes, Welch's *t*-test was used instead of Student's *t*-test (Delacre, Lakens, & Leys, 2017). The NHST result indicated that scenario scores were not significantly different between two SVO groups, $t(52.94) = -0.284, p = .778, d = -.06$. The TOST procedure indicated that the observed effect size ($d = -0.06$) was significantly within the equivalence bounds of -0.68 and 0.68 . Thus, scenario scores in the two groups were statistically equivalent, $t(52.94) = 2.488, p = .008$. Conclusively, H1 is supported by the nonsignificant

NHST results and significant equivalence TOST results and there were no meaningful relations between distributional preferences and social trust decision.

Table 2. NHST Results and TOST Results for Trust Decision in the Scenario

Variables of interest	NHST ^a TOST ^b	Test Result Test Result ^c	NHST 95% CI TOST 90% CI ^d	Equivalence bounds ^e
Correlations				
SVO & Scenario Responses	NHST	$r(130) = .063, p = .475$	[-0.110, 0.233]	
	TOST	$r(130) = .063, p = .020^*$	[-0.083, 0.206]	[-0.24, 0.24] ^f
Sending in DG & Scenario responses	NHST	$r(130) = -.016, p = .857$	[-0.188, 0.157]	
	TOST	$r(130) = -.016, p = .005^{**}$	[-0.161, 0.129]	[-0.24, 0.24]
Sending in UG & Scenario responses	NHST	$r(130) = .069, p = .435$	[-0.104, 0.238]	
	TOST	$r(130) = .069, p = .024^*$	[-0.077, 0.212]	[-0.24, 0.24]
Receiving in DG & Scenario responses	NHST	$r(130) = .047, p = .595$	[-0.126, 0.217]	
	TOST	$r(130) = .047, p = .013^*$	[-0.099, 0.191]	[-0.24, 0.24]
Receiving in UG & Scenario responses	NHST	$r(130) = -.066, p = .456$	[-0.236, 0.107]	
	TOST	$r(130) = -.066, p = .022^*$	[-0.209, 0.080]	[-0.24, 0.24]
	Group	mean difference in scenario responses		
Individualistic & Prosocial	NHST	$t(52.94) = -0.284, p = .778$	[-0.564, 0.424]	
	TOST	$t(52.94) = 2.488, p = .008^{**}$	[-0.483, 0.343]	[-0.68, 0.68]

Note: * indicates significance at $p < .05$ and ** indicates significance at $p < .01$; **a** The NHST stands for Null Hypothesis Significance Test; **b** The TOST stands for Two One-Sided Test; **c** Only the one-sided test with the highest p value is reported in TOST results; **d** TOST CIs cover 90% ($1 - 2\alpha$) because two one-sided tests are performed with each $\alpha = .05$; **e** Equivalence bounds in TOST are computed based on the assumption of 80% power, $\alpha = .05$, and a given sample size; **f** Equivalence bounds are identical across all correlation tests because Spearman's rank correlation coefficient is computationally identical to Pearson product-moment coefficient (see Laken, 2017).

Then, the relations between the three materialistic preference variables were explored using the total sample ($N = 260$). As shown in the upper section of Appendix C, some significant correlations were found, implying the distributional preferences are positively related to each other. Although categorical, the four SVO types (competitive, individualistic, prosocial, and altruistic) were set as 1, 2, 3, and 4, respectively. Roughly speaking, the higher the value on the SVO, the more other-regarding. Spearman's correlations between the SVO and the sender's transfer in the DG and UG show that those who were more other-regarding tended to send more money to the recipient in the games (See the fifth row in Appendix C).

H2 states that distributional attitude would be strongly related to trust behavior in the game. The game outcomes were (1) the number of passes made during the game and (2) the final income

earned by the player. The analysis result showed that those who sent more to the receiver in the DG tended to earn more in the centipede game, $r(130) = .180, p = .041$. Based on Spearman's rho coefficients it was found that the SVO was significantly correlated to the number of passes, $r(130) = .220, p = .012$, and to the final income, $r(130) = .217, p = .013$. Overall it indicated that more other-regarding people made more passes and also earned a higher income. Excluding the competitive type, *t*-tests were conducted with the two major types. The result was significant for the income, implying that prosocial types earned more than individualistic types (See the last column in Table 3). These findings are consistent with H2 and support strong associations between materialistic preferences and game outcomes.

Table 3. Descriptive Statistics and *t*-test Results of Game Outcomes by SVO (SD in parentheses)

	Competitive (<i>n</i> = 3)	Individualistic (<i>n</i> = 39)	Prosocial (<i>n</i> = 88)	<i>t</i> -test for individualistic and prosocial
Pass	0.00 (.00)	5.05 (3.46)	6.15 (3.50)	$t(125) = -1.505, p = .135, d = 0.32$
Income	4.00 (.00)	819.49 (1335.2)	1396.55 (1706.1)	$t(91.88) = -2.055, p = .043, d = 0.38$

ADDITIONAL ANALYSIS

Some argue that from the behavioral economics perspective, circumstantial information irrelevant to one's benefits should not influence decisions because cognitive loads distract one's attention and diffuse focused efforts (Freund & Keil, 2013). By contrast, others suggest that abundant social and contextual information can improve decision qualities by leading to more active cognitive processes in information search, evaluation, judgment, and decision (Ku, Kuo, Yang, & Chung, 2013). Either way, contextual information in scenarios can activate more reasoning works in readers related to the presented situations and eventually complicate judgment and decision by increasing mental processes. This could make scenarios qualitatively different from games. Clear economic goals in games can have one be decisive and straightforward, whereas rich social information in scenarios can have one take a relatively lukewarm attitude rather than clear-cut responses. To explore trust patterns between the scenario and the game, additional analyses were performed.

Data

Trust decision outcomes were scaled differently between the scenario and the game. The number of passes in the game ranged from 0 to 10 and the choice options in the scenario ranged from 1 (Definitely Not) to 6 (Definitely Yes). For consistency, original responses were transformed into ratios between 0 and 1. First, the number of passes was divided by 10 (e.g., if someone terminated the game after eight passes, the ratio became 0.8). Second, the scenario responses were transformed as follows. The choice "1: Definitely Not" that indicates absolute distrust changed into 0.0, "2: Probably Not" changed to 0.2, and "3: Possibly Not" changed to 0.4. The choice "4: Possibly Yes" was transformed into 0.6 and "5: Probably Yes" was transformed into 0.8. The final "6: Definitely Yes" that represents absolute trust changed into 1.0. Converted trust ratios set 0.0 as absolute distrust and 1.0 as absolute trust so that the responses were equally

comparable between the game and the scenario. These standardized ratio scores were grouped into five categories to track response patterns. Trust levels were defined as follow: absolute distrust in [0.0, 0.2]; moderate distrust in [0.2, 0.4]; middle in [0.4, 0.6]; moderate trust in [0.6, 0.8]; and absolute trust in [0.8, 1.0]. Operationally defining, extreme choices are absolute distrust in [0.0, 0.2] and absolute trust in [0.8, 1.0]. Other choices in [0.2, 0.8] were less excessive.

Result

Decisions in the game appeared more extreme than those in the scenario (See Table 4). Absolute distrusters were 28% of the sample pool in the game but only 3% in the scenario. Absolute trusters were 26% of the sample pool in the game but 15% in the scenario. By contrast, moderate decisions were observed more in the scenario than in the game. As a result of the *chi-square* test of independence ($N = 260$), the relation between the task type and the five decision choices was found to be significant, $\chi^2(4) = 48.306$, $p < .001$, Cramer's $V = .431$.

Table 4. Trust Choice Distribution in the Combined Data

Trust level [Ratio]	Absolute distrust [0.0, 0.2]	Moderate distrust [0.2, 0.4]	Middle [0.4, 0.6]	Moderate trust [0.6, 0.8]	Absolute trust [0.8, 1.0]
Percent within the game ($N = 130$)	28 %	14 %	10 %	22 %	26 %
Percent within the scenario ($N = 130$)	3 %	16 %	28 %	38 %	15 %

People playing the centipede game made more extreme choices, whether trust or distrust, than did those completing the scenario task. This finding suggests that the social context had an effect on people's judgment and decision. Some may argue that the medium of the experiment (game vs. scenario), not the situational context, makes the difference in the decision outcomes. However, based on previous findings that reported no significant differences between the investment game and the investment scenario (when the scenario exactly copied the game structure) in terms of investment outcomes (Buchan & Croson, 2004), it is reasonably inferred that the content can affect people's decisions over the experimental medium. Hence, if appropriate social cues are given, the scenario can help people remain cautious and make realistic decisions, which increases the external validity of research findings.

DISCUSSION

As a possible cause for prior mixed findings, this study suggested the mismatch between personality-driven attitudinal trust and situation-driven behavioral trust, which is termed *the trust construct mismatch*. As depicted in Table 1, the trust construct is divided into social trust and materialistic trust; the trust measurement object is divided into trust attitude and trust behavior. The NHST and the equivalence TOST results together showed that, as H1 predicted, the materialistic attitude was not meaningfully associated with social trust decisions in the scenario. As for H2, first, it was found that people who willingly shared their profits with the other in the DG earned a higher income in the game. Second, the more other-regarding a person was on the

SVO scale, the more passes (trust behavior) and the higher the income (trust reward) they were likely to have in the game. In short, the materialistic attitude was not significantly related to scenario responses but was significantly related to game outcomes. Moreover, significantly different trust patterns were observed between the scenario and the game. It may be best to propose that a scenario has participants hesitating to be extreme because contextual information processing occurred, while a game has participants solely concentrating on the focal goal (e.g., economic outcomes). There is no absolutely better or worse method though. Because it is like a seesaw choice between an external validity for generalizable findings and an internal validity to control unwanted noises, it is up to researchers to decide which method to use. Hopefully, this study helps researchers better understand previous mixed findings in the trust literature and also the importance of adopting proper research methods in their study.

Limitation

This study has several limitations. First, distributional preference surveys were used to measure one's general materialistic attitude, but they were not used to reflect on one's materialistic trust attitude exactly. A more refined and better questionnaire should be developed for future studies. Second, the two stories used in the scenario method were varied in terms of the amount of money at stake, and the amount also deviated from the average income in the game. For better and fairer comparisons across all decision tasks, future studies need to set similar budget sizes. Third, the two decision tasks, scenarios and games, were different in terms of framing the decision. According to the framing effect (Levin, Schneider, & Gaeth, 1998), people can interpret the same decision situation differently because of how the frame describes the situation, which can cause people to make opposite decisions. The story used in the scenario method was *loss-framed* as the participants had to decide to "spend" their own money on a car. In contrast, the task in the game was *gain-framed* since the participants could "earn" rewards by playing the game and they had nothing to lose. This difference in the frame might have had an effect on people's perception of the decision situation. It is suggested that future studies employ identically framed tasks to maintain similarities across tasks.

Future Direction

The equivalence test was employed to test H1 in this study. Some could pose questions regarding the arbitrary criteria to set equivalence bounds or the risks to miss theoretically important but small effects. Admittedly, unsolved statistical issues remain with testing the absence of an effect. One solution would be to conduct more trust experiments and accumulate information on the power and the effect size.

More importantly, a proper materialistic trust attitude questionnaire is necessary. There are two approaches available from two different theoretical origins. As mentioned in the introduction, the psychological trust definition (Colquitt et al., 2007) reflects on social, interactive, and human-focused features of trust (e.g., placing oneself in a vulnerable position for others). However, the definition originated from behavioral and experimental economics (Gunnthorsdottir et al., 2002) insinuates transactional and materialistic features of trust (e.g., giving one's something to someone). It can be viewed that the former is actor-centered, but the latter is object-centered.

Taking the first approach, a materialistic trust attitude measure can be developed by partially modifying items in classical social trust questionnaires by changing the context from social to economic. In Rotter's Interpersonal Trust Scale (1967), for example, one item stating "One is better off being cautious when *dealing with strangers...*" can be revised as "One is better off being cautious when *doing business with strangers...*" Another item saying, "Most people are primarily interested in *their own welfare*" can be reworded as "Most people are primarily interested in *their own economic benefits*". Items such as "Most salesmen are honest in describing their products" and "A large share of accident claims filed against insurance companies are phony" would need no editing. Additionally, questions on the truster's materialistic belief(s) about people, groups, institutes, markets, and society can be created (e.g., "Most prices of goods are fairly determined by a reasonable demand–supply principle" or "Charities contribute to the fair distribution of social wealth"). Next, taking the second approach, a materialistic trust attitude survey can be created by focusing on the object of trust, particularly, goods as an instrument to measure trust levels in an economic sense. An issue with pervasively used distribution preference measures (e.g., SVO) is that an endowment is presented in currency units (e.g., dollars) or ambiguously expressed (e.g., points). Also, they do not include core trust components such as risk-taking and unguaranteed return. Thus, by diversifying specific trust objects and varying relevant social factors, a new measure can be constructed. For instance, consider a questionnaire item like "Upon request, I would lend \$10 (A) to a *classmate I barely know* (B) for *one day* (C)". The transaction item of (A) could be varied in values from a cheap calculator to an expensive car or a home. The social distance to a trustee (B) could be varied from a close family member to a distant stranger. The period of trust or the number of expected interaction (C) could be manipulated from short-term to long-term or from one-time to multiple times. Other important dimensions of trust could be also added to the survey.

Lastly, the validity of the scenario method for social trust behavior should be continuously examined. Social trust behavior used in this study involved an economic decision. It will be worth researching the relation between materialistic trust attitude and non-economic trust behavior with a scenario, which may yield statistically better outcomes to demonstrate a true non-association. In accordance with research topics, variations in the content of scenarios should be made on the dimension of a trustee's character, relational properties, the degree of risk, the chance of future encounters and reciprocal returns, emotionality, etc.

REFERENCES

- Ahmed, A. M., & Salas, O. (2009). The relationship between behavioral and attitudinal trust: A cross-cultural study. *Review of Social Economy*, 67(4), 457–482.
- Ben-Ner, A., & Halldorsson, F. (2010). Trusting and trustworthiness: What are they, how to measure them, and what affects them. *Journal of Economic Psychology*, 31(1), 64–79.
- Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. *Games and Economic Behavior*, 10(1), 122–142.

- Buchan, N. R., & Croson, R. T. A. (2004). The boundaries of trust: Own and others' actions in the US and China. *Journal of Economic Behavior and Organization*, 55(4), 485–504.
- Camerer, C. F. (2003). *Behavioral game theory: Experiments in strategic interaction*. New York, NY: Princeton University Press.
- Colquitt, J. A., Scott, B. A., & LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: A meta-analytic test of their unique relationships with risk taking and job performance. *Journal of Applied Psychology*, 92(4), 909–927.
- Crisp, R. J., & Turner, R. N. (2009). Can imagined interactions produce positive perceptions? Reducing prejudice through simulated social contact. *The American Psychologist*, 64(4), 231–240.
- Delacre, M., Lakens, D., & Leys, C. (2017). Why psychologists should by default use Welch's *t*-test instead of Student's *t*-test. *International Review of Social Psychology*, 30(1), 92–101.
- Derks, J., Lee, N. C., & Krabbendam, L. (2014). Adolescent trust and trustworthiness: Role of gender and social value orientation. *Journal of Adolescence*, 37(8), 1379–1386.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191.
- Fehr, E. (2009). On the economics and biology of trust. *Journal of the European Economic Association*, 7(2–3), 235–266.
- Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. *Games and Economic Behavior*, 6(3), 347–369.
- Freund, A. M., & Keil, A. (2013). Out of mind, out of heart: Attention affects duration of emotional experience. *Cognition & Emotion*, 27(3), 549–557.
- Glaeser, E. L., Laibson, D. I., Scheinkman, J. A., & Soutter, C. L. (2000). Measuring trust. *The Quarterly Journal of Economics*, 115(3), 811–846.
- Goto, S. G. (1996). To trust or not to trust: Situational and dispositional determinants. *Social Behavior and Personality: An International Journal*, 24(2), 119–131.
- Gunnthorsdottir, A., McCabe, K., & Smith, V. (2002). Using the Machiavellianism instrument to predict trustworthiness in a bargaining game. *Journal of Economic Psychology*, 23(1), 49–66.
- Güth, W., Schmittberger, R., & Schwarze, B. (1982). An experimental analysis of ultimatum bargaining. *Journal of Economic Behavior and Organization*, 3(4), 367–388.

Holm, H. J., & Danielson, A. (2005). Tropic trust versus Nordic trust: Experimental evidence from Tanzania and Sweden. *Economic Journal*, 115(503), 505–532.

Ku, H., Kuo, C., Yang, Y., & Chung, T. (2013). Decision-contextual and individual influences on scarcity effects. *European Journal of Marketing*, 47(8), 1314–1332.

Lakens, D. (2017). Equivalence tests: A practical primer for t tests, correlations, and meta-analyses. *Social Psychological and Personality Science*, 8(4), 355–362.

Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76(2), 149–188.

McKelvey, R. D., & Palfrey, T. R. (1992). An experimental study of the centipede game. *Econometrica*, 60(4), 803–836.

Miles, E., & Crisp, R. J. (2013). A meta-analytic test of the imagined contact hypothesis. *Group Processes & Intergroup Relations*, 17(1), 3–26.

Murphy, R. O., Ackermann, K. A., & Handgraaf, M. (2011). Measuring Social Value Orientation. *Judgment and Decision Making*, 6(8), 771–781.

Rotter, J. B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality*, 35(4), 651–665.

Schuirman, D. J. (1987). A comparison of the Two One-Sided Tests Procedure and the Power Approach for assessing the equivalence of average bioavailability. *Journal of Pharmacokinetics and Biopharmaceutics*, 15(6), 657–680.

Selin, C. (2006). Trust and the illusive force of scenarios. *Futures*, 38(1), 1–14.

Van Lange, P. A., De Bruin, E. M. N., Otten, W., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, 73(4), 733–746.

APPENDIX A. DICTATOR GAME AND ULTIMATUM GAME QUESTIONNAIRE

From now, you will do simple group resource allocation tasks. In each task, you are assumed to be coupled with an anonymous partner. Also, the partner is presumed to be replaced across tasks; when you get into a new task, you are most likely to meet with a new partner. In some tasks, your final outcome can be influenced by your partner's decision. There is no right or wrong answer here. Please indicate your personal preferences in deciding.

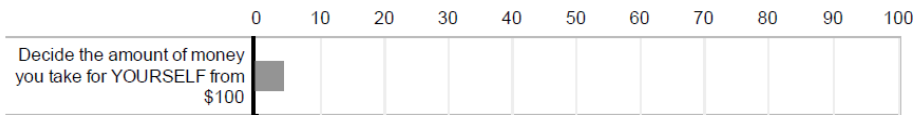
Imagine that you are given \$100 under two conditions.

(1) There is one person who knows you have \$100, and you should divide \$100 for yourself and for the other person. You cannot take the whole \$100 and you should send at least \$1 to the other person.

(2) Regardless of whether that person likes your decision or not, he or she should receive the amount of money you send. It means you are in a position to make the call and the other person cannot refuse it and should just accept his or her portion.

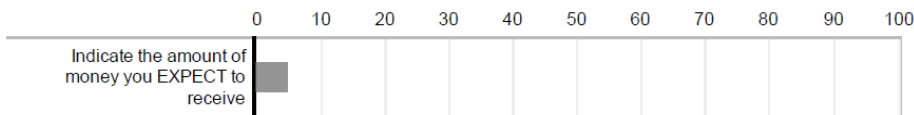
Suppose that you take \$90 for yourself and send the rest \$10 to the other. Then, you earn \$90 and the other's earning is \$10. For another example, if you transfer \$50, you and the other person will earn \$50.

Now, by dragging the bar below, indicate how much you will take for yourself from \$100. Note that the remaining will be sent to the other person.



Suppose that the ROLES CHANGE. Now you are in the position to unconditionally accept the amount of money sent by someone. You have NO right to reject it.

By dragging the bar below, indicate how much you expect to receive FROM THE OTHER PERSON (in dollars).



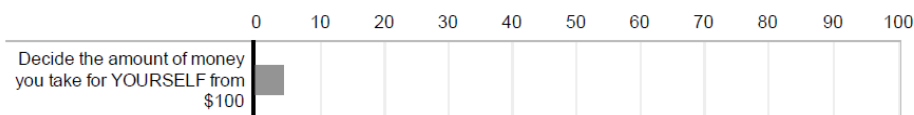
Imagine a similar but DIFFERENT situation. You are given \$100 under two conditions.

(1) There is one person who knows you have \$100, and you should divide \$100 for yourself and for the other person. You cannot take the whole \$100 and you should send at least \$1 to the other person.

(2) The other person has a right to REJECT your offer. If he or she refuses the money you send, NO ONE can get the money.

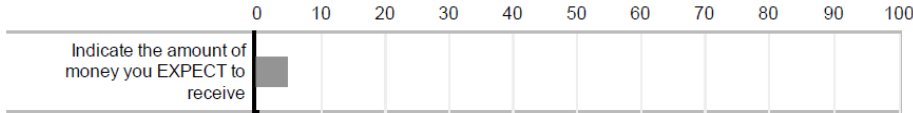
Suppose that you take \$70 for yourself and send \$30 to the other. If the other person accepts it, you will earn \$70 and the other will get \$30. If that person rejects your offer, however, neither of you can get any dollars. Both will end up with nothing.

Now, by dragging the bar below, indicate how much you will take for yourself from \$100. Note the remaining money will be sent to the other person. If s/he rejects to receive, you will earn nothing.



Suppose that the ROLES CHANGE. Now you are in the position to accept or reject the amount of money transferred by someone. You have a right to reject. If so, it will result in no earnings for both.

By dragging the bar below, indicate how much you expect to receive FROM THE OTHER PERSON (in dollars)?



Note: Appendix A presented here is modified for a printed version. Original materials used in the experiment and their *Qualtrics* codes can be provided upon request.

APPENDIX B. CENTIPEDE GAME STRUCTURE

Round	Player		A's gain	B's gain	Total
1	A's Turn	A STOP PASS	A gets 4	B gets 1	Sum: 5
2	B's Turn	B STOP PASS	A gets 2	B gets 8	Sum: 10
3	A's Turn	A STOP PASS	A gets 16	B gets 4	Sum: 20
4	B's Turn	B STOP PASS	A gets 8	B gets 32	Sum: 40
5	A's Turn	A STOP PASS	A gets 64	B gets 16	Sum: 80
6	B's Turn	B STOP PASS	A gets 32	B gets 128	Sum: 160
7	A's Turn	A STOP	A gets 256	B gets 64	Sum: 320

		PASS				
8	B's Turn	B PASS	STOP	A gets 128	B gets 512	Sum: 640
9	A's Turn	A PASS	STOP	A gets 1024	B gets 256	Sum: 1280
10	B's Turn	B PASS	STOP	A gets 512 A gets 4096	B gets 2048 B gets 1024	Sum: 2560 Sum: 5120

APPENDIX C. INTER-ITEM CORRELATIONS

Pearson Correlations	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
Attitude Survey (<i>N</i> = 260)									
1 One's transfer to a receiver in DG	41.07	18.80	—						
2 One's expectation of sender's transfer in DG	34.05	19.60	.163**	—					
3 One's transfer to a receiver in UG	46.33	13.77	.569**	.095	—				
4 One's expectation of sender's transfer in UG	44.24	14.66	.053	.475**	.270**	—			
5 Social Value Orientation (<i>Spearman Corr</i>)	2.70	.498	.381**	.049	.285**	.070	—		
Trust Experiment (<i>n</i> = 130 each)									
6 Trust in a scenario	4.36	1.161	-.016	.047	.069	-.066	.063	—	
7 Trust in a game (Pass)	5.68	3.577	.127	-.003	.075	-.058	.220*	.	—
8 Trust in a game (Point)	1191.3	1609.8	.180*	.004	.143	-.025	.217*	.	.790**

Note: * indicates a significant relation at $p < .05$ and ** indicates a significant relation at $p < .01$ (two-sided); *M* = Mean and *SD* = Standard Deviation; Item 5 shows Spearman's correlations; Each item's response range varies: Item 1 to 4 (0 to 100), Item 6 (1 to 6), Item 7 (0 to 10), and Item 8 (2 to 4096).

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