Gaming Trust and Reciprocity: Some Experimental Evidence

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Abstract

This paper extends the extant literature on trust and reciprocity along three dimensions using a variant of the standard investment game, originally introduced by Berg, Dickhaut and McCabe (1995). *First*, we allow participants to send signals to their counterparts in a repeated interaction setting to build reputation, and hence achieve higher levels of trust and reciprocity. *Second*, we provide the investor with the power to veto the receiver's allocation decision as a self-enforcing mechanism to enhance the level of cooperation, thereby enabling pricing of the power of retaliation and salience of reciprocal behavior. *Third*, we explicitly examine and calibrate the influence of two important personal attributes (value orientation and risk attitude) on trust and reciprocity levels. In addition, we computerized the experiment in order to maintain the highest level of privacy for subjects in their decision making process.

Our findings suggest (as predicted) that signaling through repeated interactions improves the level of trust and reciprocity significantly above the base line of the one-shot game. Trust and reciprocity levels are highest under the veto setting indicating that participants are able to correctly price the power of retaliation. The policy implication of the salubrious nature of countervailing power in the marketplace is thus bolstered. We also find that that value orientation and risk preferences are important drivers of the base-line level of trust and reciprocity. Furthermore, the trusting behavior of males and females are substantially different in the one-shot setting and repeated interaction setting, but not under the veto setting. This indicates that aggregate inferences from behavior of subjects (without accounting for gender) could be misleading and lead to erroneous understanding of actual behavior.

JEL Classification: C70, C91, D63, D81, D82

Key Words: Trust, Reciprocity, Risk Preference, Value Orientation, Gender, Repeated Interaction, Veto Power

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1. Introduction

Trust between transacting business parties is the overarching economic issue facing market participants, including regulators across the world. Following the high profile collapse of large corporations such as Enron, WorldCom, Arthur Andersen (in the US) and more recently Parmalat (in Europe), trust and reciprocity issues have taken centre-stage in policy and academic discourse. Recently, erosion of trust in the governance structure of firms is cited as one of the main reasons for continued turmoil in the capital markets around the world.[1]

Arrow (1974) stresses the ubiquity of trust (as a transaction cost depressant) in almost every economic transaction. He finds that higher rates of investment and growth are positively associated with higher levels of trust. Khalil (1994) argues that in market-based societies, where individuals are motivated by rational, self-interested behavior, there is a greater need for trust than in kin-based or other forms of economic organization. He notes that, "First, as economic exchange becomes less intermingled with kinship and more based on formal contractual relationships, the monitoring conducted by the kin members and the threat of ostracism almost vanish. Second, the modern judicial system, which replaces the threat system of ostracism and shunning, can not practically monitor the extensive growth of contractual agreements-even the explicit ones" (Khalil 1994, 340). Therefore the need for trust, integrity and trustworthiness seems greater in a market-based economy, where most control mechanisms are incomplete at best. Arrow (1974) argues that, because of incomplete contracts, and the prohibitive transaction costs of perfect monitoring, much economic activity

[1] Federal Reserve Chairman Alan Greenspan in a recent speech states that "[I] am pleased to see a re-emergence of market value placed on trust and personal reputation governing business practice. After the revelations of corporate malfeasance, the market punished the stock prices of those corporations whose past behaviors cast doubt on reputations. I hope and anticipate that trust and integrity again will be amply rewarded in the marketplace as they were in earlier generations", *Reuters*, April 9, 2003.

requires trust and reciprocity in order for mutual gains from exchange to be realized.[2] Zak and Knack (2001) demonstrate that if trust is sufficiently low, so little investment will be undertaken that economic growth is unachievable as the transaction costs associated with investment will be considerably high, resulting in a low-trust poverty trap. In addition, reciprocity may be essential to the development of a modern economy wherein the effort of highly skilled labor cannot be effectively monitored.[3]

A strand of literature has been examining trust and reciprocity issues in a behavioral game context: Investment (Trust) game in a one-shot setting (see for example, Berg et al., 1995; Hoffman et al. 1996; Cox and Deck, 2002). This literature has mainly focused on contextual factors that drive the underlying behavior of trust and reciprocity. Prior studies[4, 5] have manipulated the external treatments to elicit the intentions of participants' behaviors under different circumstances to understand the decision process involved in arriving at the observed level of trust-reciprocal behaviors. The implicit assumption of these studies has been to consider the human decision process as a "black box". Consequently, what motivates people to deviate from game theoretic behavioral norms is not well understood. By measuring

[2] Prior research has suggested that trust and reciprocity can serve as a substitute for, or a complement to, more formal governance structures (Zaheer and Venkatraman, 1995). Trust implies that an individual will subordinate his/her self-interests to the "joint interests" of the group under most conceivable circumstances (Arino et al. 2001). Furthermore, if business/agency relationships built on trust and reciprocity succeed, then the dead-weight loss on welfare imposed by costly incentive and monitoring systems can be avoided.

[3] This relates to the emergent discipline of knowledge economics that seeks to understand, value, elicit and synthesize knowledge diffused among knowledge workers in synchronous and asynchronous contexts.

[4] Prior experimental literature (see for example, Hoffman, McCabe and Smith, 1996; Cox and Deck, 2002; McCabe, Rigdon and Smith, 2003) has shown that the degree of trust and trustworthiness varies substantially and are associated with various factors such as individual preferences towards payoffs, prior experience, player's capacity to learn more about personal characteristics of each other and social distance, among others. In these experiments, various contextual factors associated with the structure of the experiments are manipulated to explain the variance in the levels of trust and trustworthiness.

[5] According to Ostrom and Walker (2003, 5), "Trusting and trustworthy behavior are not unchanging, universal attributes of all individuals but are rather the results of multiple contextual and individual attributes. Understanding trust and the conditions that are conducive to trust is a challenging task".

and controlling certain individual characteristics that are expected to directly influence the level of trust and reciprocity[6], this study empirically assesses the importance of these variables in explaining the base-line level of trust and reciprocity. In this way, it attempts to unlock the "black box" of trust-reciprocal decision processes. Furthermore, by directly measuring and incorporating two important personal attributes (value orientation and risk preference) in the statistical analysis, this study allows a rigorous examination of the game theoretic prediction of zero trust and reciprocity based on assumptions of rational and self-interested behavior. This study also investigates the role of gender on trust and reciprocity, which the prior literature has found to be an important explanatory factor in social interactions (Croson and Buchan, 1999; Cox, 2002; Cox and Deck, 2002; Chaudhuri and Gangadharan, 2002).

We use a variant of the standard investment game, originally introduced by Berg, Dickhaut and McCabe (1995), to study the levels of trust and reciprocity.[7] In this game two players are paired anonymously, with one player designated as the sender and the other as the receiver. Both players get a fixed initial endowment known to each other. The sender is told that she can keep the entire amount or send the whole or part of the endowment to the anonymous receiver with whom she is paired. Any amount that the sender offers to the receiver is tripled by the experimenter. The receiver is then asked to allocate the sum of the tripled amount plus his period endowment between him and the sender. The receiver is told that he is free to keep the entire amount for himself or, if he chooses, he can send some or all

[6] We recognize that there are many dimensions of individual attributes and we do not attempt to span the entire vector of all individual attributes in this study. Rather, we focus on two individual characteristics, i.e., *risk preferences* and *value orientation* that are particularly relevant to trust and reciprocity.

[7] The individual attributes of value orientation and risk preferences are measured independently on a day prior to the day when actual experimental sessions were conducted.

of it back to the anonymous sender. The game ends after this point.[8]

The primary contribution of this paper is that it enhances our understanding of the forward induction behavior by extending the above standard investment game. First, we run the investment game over multiple periods to allow reputation formation with a view of trust as credibility or capitalized reputation. In this way, trust can be thought of as a form of social capital – a shared asset that benefits all in the economy (Fukuyama, 1995). Second, we modify the standard investment game by empowering the sender with the right to 'veto' the allocation decision of the receiver to calibrate reciprocity actions. In this way, we extend the forward induction literature by finely partitioning out the trust factor (whom can you trust) and the reciprocity factor (who trusts you).

Figure 1 about here

The results reported in this study provide strong evidence that value orientation and risk preferences are important drivers of base-line level trust and reciprocity. As expected, signaling through repeated interactions improves the level of trust and reciprocity significantly above the base line of the one-shot game. The trust and reciprocity levels are highest under the 'veto' setting indicating that participants are able to correctly price the power of retaliation. Consistent with prior literature, we provide evidence that gender is an important factor in trust decisions. We find that the trusting behavior of males and females in the one-shot setting and repeated interaction setting is substantially different. This indicates

[8] The resolution of this game is simple. In the one-shot version of the game, the receiver should not send any money back knowing that the game ends immediately thereafter. The sender, anticipating the receiver's decision, should send no money to the receiver in the first place. However, Berg et al. (1995) and Croson and Buchan (1999) have shown that the actual behavior is quite different from the one predicted above. The senders send on average a significant positive sum to the receiver exhibiting some "trust" in the receiver. The receiver reciprocates this trust by sending some money back. By sending money back to the original sender, the receiver exhibits positive "reciprocity".

that aggregate inferences from behavior of subjects (without accounting for gender) may be misleading in understanding actual behavior. The implication of our results for incentive control is that "one size fits all" control systems may not be efficient. Personal attributes and gender are important factors in building trust and reciprocity and understanding the interactions of these factors may lead to alternative incentive control systems which may be more efficient than those that focus solely on contracting and direct monitoring systems.

The rest of the paper is organized as follows. *Section 2* outlines the theory and the development of hypotheses. *Section 3* describes the experimental methods. *Section 4* presents our results. *Section 5* offers concluding observations.

2. Theory and Hypotheses

In this study, we focus on two aspects of subjects' behavior that are likely to influence their base-line level of trust and reciprocity – personal attributes (risk attitude and value orientation) and gender. In addition, we investigate the impact of two treatment conditions on the level of trust and reciprocity - repeated interaction and the ability to veto the allocation decision. To facilitate enhanced readability, we outline the individual characteristics hypotheses followed by the treatment condition hypotheses.

2.1 Individual Characteristics Hypotheses

2.1.1 Risk Attitudes

James (2002) characterizes trust as a risky action taken by an agent to an economic transaction under uncertainty or informational incompleteness with the anticipation that the other agent to the transaction will not behave opportunistically (i.e., will not exploit the vulnerability that the agent has created for himself or herself by taking the risky action). Standard incremental models of trust development (Rempel, Holmes, and Zanna, 1986)

suggest that trust initiators should be careful, because trust involves risk. This is especially so in a one-shot investment game where there is no opportunity to retaliate or punish. Therefore, by sending a positive amount to their receivers, individuals take a risk by placing trust in receivers to behave in cooperative and non-exploitative ways (Ostrom and Walker, 2003). Thus, risk attitude is expected to have an impact on the level of trust, where risk seekers are likely to send more, relative to risk-averse individuals. This leads to our first hypothesis, which is stated in its null form as:

H1a: *The level of trust is independent of subjects' risk preferences.*

In the one-shot version of the investment game senders take a risk by sending some positive amount of money to the receivers. However, receivers face no risk when deciding how much money, if any, to return. Therefore, risk preferences will not influence the level of reciprocity. [9] This statement is restated in a null hypothesis form as follows:

H1b: *The level of reciprocity is independent of subjects' risk preferences.*

2.1.2 Value Orientation

According to many social psychologists, people pursue different goals when making decisions that affect others (Offerman, Sonnemans and Schram, 1996). Preferences regarding one's own well-being relative to others' appear to vary across individuals. An often used classification distinguishes various value orientations; *competitors* usually want to be better off than their counterparts; *individualists* try to do the best for themselves regardless of the well-being of others; and *cooperators* pursue the best for themselves and others. Rare value orientations are *altruism* and *aggression* where altruists want to do the best for others, regardless of the outcome of their own well-being, while aggressors want to do worst for

[9] However, risk attitudes may influence the level of reciprocity in the repeated interaction framework and in the setting where the sender is endowed with power to veto allocations.

others, regardless of the outcome for themselves.[10] Given these value orientations, the social psychology literature notes two hypotheses to account for expectations and behavior. First, the *triangle hypothesis*[11], Kelley and Stahelski (1970) state that individualists and competitors tend to expect others to pursue an individualistic or competitive goal as well, whereas cooperators anticipate that others might have either a cooperative or an individualistic/competitive value orientation. Second, the *false consensus hypothesis*[12], Kuhlman and Wimberly (1976) states that individuals tend to expect others' behavior to be the same as the behavior prescribed by their own value orientation. Accordingly, both the triangle hypothesis and the false consensus hypothesis posit that the level of trust will be higher with higher value orientation, with altruists exhibiting highest levels of trust and aggressors the lowest. This leads to our second hypothesis stated in its null form as,

H2a: *The level of trust is independent of value orientation.*

We note that value orientation will have a positive influence on other-regarding behavior. Altruists and cooperators will function as egalitarians and care more for others' payoffs and equality of payoffs in an investment game compared to competitors and aggressors. Accordingly, value orientation will have a direct influence on positive reciprocity; receivers with higher value orientation will reciprocate more relative to receivers with lower value orientation. The ability to recognize the origins of trust may also be influenced by an individual's value orientation. The ability to recognize an action, which is considered as *kind*,

[10] As explained later, the value orientation measure captures the natural ordering of the other regarding behavior.

[11] The rationale behind the hypothesis is that competitors and individualists misjudge the goals pursued by other individuals to some extent, because their own innate choice behavior tends to elicit the same behaviors of others regardless of the others' value orientation.

[12] For example, cooperators tend to expect cooperative behavior by others. In this view, expectations are rationalized on the basis of behavior, or, in other words, expectations of others' behavior are determined by one's own personal behavior.

and to overlook *unkind* actions will be strongly correlated with value orientation. This leads to our next hypothesis stated in its null form as,

H2b: *The level of reciprocity is independent of value orientation.*

2.1.3 Gender

With greater participation of women in the work force and decision-making roles, the examination of gender differences in decision-making has increased in importance.[13] The prior literature (Croson and Buchan, 1999; Cox, 2002; and Chaudhuri and Gangadharan, 2002) finds mixed evidence on the role of gender in the level of trust. Croson and Buchan, (1999) and Cox (2002) find no significant effect of gender on trusting behavior, whereas Chaudhuri and Gangadharan (2002) find that males exhibit greater amounts of trust than females. They attribute this difference in trust to greater amount of risk aversion on the part of females. If their explanation is valid, and conditional on hypothesis **H1a** we should not observe any differences in trusting behavior between females and males on this account because we explicitly control for risk preferences. If the null is rejected then the risk explanation is incomplete. However one strand of literature suggests that females may choose a competitive strategy for fear of falling into the "sucker" (choosing cooperation when the other player defects) role, Ingram and Berger (1977). This leads to our third hypothesis stated in its null form as,

H3a: *The propensity to trust is independent of gender.*

One of the well-developed theoretical explanations for factors contributing to gender differences in social interactions is *social role theory* (Eagly, 1987). According to social role theory, both females and males should exhibit behavior consistent with their respective gender

[13] According to Powell and Grace (2003) "Sex differences influence how people are disposed to behave in work settings. Females and males are similar in some ways and different in others. Despite thousands of studies, however, researchers do not agree about the scope, magnitude, or cause of sex differences."

roles, i.e., females being communal, reflecting concerns for others and selflessness (Wiggins 1992) and males being agentic and dominant (Carli and Eagly, 2002). If females adhere to their gender roles, we would expect them to be more reciprocating than males. Furthermore, Eckel and Grossman (1998) have observed that the influence of gender is conditional on the level of risk present in the experiment. In reciprocity decisions, which involve no risk, Corson and Buchan (1999) find that females tend to be more generous and socially oriented. This result is also supported by Cox (2002) and Chaudhuri and Gangadharan (2002). Andereoni and Vesterland (2001) find that males are more likely to be either perfectly selfish or perfectly selfless, whereas females tend to be "egalitarians" who prefer to share evenly. In the context of the investment game, since both sender and receiver begin with equal endowments, we hypothesize that females will reciprocate more than males to make the allocation more equitable. The above reasoning leads to our next hypothesis stated in its null form as,

H3b: *The propensity to reciprocate is independent of gender.*

2.2 Treatment Conditions Hypotheses

2.2.1 Repeated Interactions

Most business activities are conducted in an ongoing basis than as one time deals. In a repeated interaction framework, one's reputation may be an effective apriori control on ex-ante opportunism. In a repeated multi-period investment game, subjects will attempt to create incentives that induce other party to cooperate through building reputation and sending credible signals to their counterparts to influence them to adopt a strategy that enhances cooperation and leads to Pareto-superior outcomes (see Kreps et al. 1982; Fudenberg and Maskin, 1986; Fudenberg and Levine, 1992; Eckel and Wilson, 2003). Given this conjecture, we extend the one-shot investment game to a repeated game. This reputation building

mechanism encourages the sender to trust more and, in return, the receiver honors the trust in order to reinforce the sender's trust in future interactions. This leads to the fourth hypothesis stated in its null form as,

H4a: *The level of trust is invariant to repeated interactions.*

H4b: *The level of reciprocity is invariant to repeated interactions.*

2.2.2 Fear of Retaliation

In the two-person investment game, the trusting behavior is constrained by the risk involved in sending a positive amount that may or may not be reciprocated by the receiver. The opportunity vested with senders to retaliate or punish possible self-regarding behavior by the receivers may increase the propensity to trust by the senders which increases the overall group surplus. The fear of retaliation by senders may also increase the propensity to reciprocate by the receivers. To examine this conjecture on the salubrious nature of countervailing power, we extend the standard investment game, by allowing the sender to accept or reject the allocation decision of the receiver. If the original sender rejects the allocation, both the sender and the receiver get zero payoffs. This feature of the experimental design can be seen as a variant of the standard ultimatum game. As in the ultimatum game, the addition of the opportunity to retaliate or punish will induce more trusting behavior by senders and the fear of retaliation will induce more reciprocating behavior by the receivers. This leads to the fifth hypothesis stated in its null form as,

H5a: *The level of trust is invariant to an ultimatum setting.*

H5b: *The level of reciprocity is invariant to an ultimatum setting.*

3. Experimental Design and Procedures

A total of 108 subjects (65 males and 43 females) were recruited from undergraduate classes at a medium-sized university. During the recruitment phase, students were told that the

experiment involves simple decision-making, and that the details would be given to them during the experiment. In addition, they were told that the experiment would require them to participate in two separate sessions, where each session would be conducted on a different day and that each session would last on average for about two and one-half hours. They were also informed that during the course of the experiment they would earn real money and that they would be paid in cash at the conclusion of each experimental session.

3.1 The First Experimental Session (Eliciting Risk Preferences and Value Orientation):

In the first experimental session, we elicited subjects' risk preferences and value orientation. This allows us to isolate these individual intrinsic characteristics from the pure economic decision-making behavior assumed by economic theory such as risk neutrality, egoistic, and profit maximizing behavior.

We conducted the first experimental session with four groups of 30, 20, 26, and 34 subjects, where each session lasted approximately 90 minutes. Across the four groups, subjects earned an average $24. In two groups, we first administered the risk attitude lottery game, followed by the value orientation experiment, while we reversed the order with the other two groups. At the start of each of these sessions, each subject was assigned a random ID by drawing a number from a hat that included "N" index cards numbered from 1 to N, where N is the total number of participants in the session. Subjects were instructed to keep their subject ID numbers confidential and not to share them with others. At the conclusion of each of the first experimental sessions, subjects were asked to sign up for the second experimental session by choosing one of four different time slots.[14]

[14] All the subjects (except two) returned to participate in the investment game.

3.1.1 Eliciting Subjects' Risk Preferences

To elicit subjects' risk preferences, we used the two-stage lottery mechanism developed by Becker, DeGroot, & Marschak (1964). In the first stage, subjects were presented with a lottery gain prospect to win a prize of 100 laboratory francs[15] with probability *p*, and zero with probability *1-p*. Then, we elicited subjects' certainty equivalent by offering them the opportunity to sell back the lottery to the experimenter for certain cash. We asked them to determine the *minimum selling price* that they would be willing to accept in exchange for the chance of winning the 100 francs prize with a specified probability. To determine whether subjects would be able to sell the lottery for certain cash or play the lottery, we draw a card at random from a shuffled deck of 100 cards. These cards are printed with values from 1 franc to 100 francs. If the amount shown on the card were equal to or greater than the minimum selling price, the subject would receive the amount shown on the card, otherwise the subject would play the lottery at the specified probability. Finally, for those who played the lottery in a given trial, we draw another card from a different deck which has 100 cards, numbered from 1 to 100. If the number shown on the card drawn is equal to or smaller than the percentage chance of winning, those who played the lottery would win and receive 100 francs, otherwise they would *lose* the lottery and get paid nothing for that round.

The lottery game was played for 24 rounds with different percentages of winning the lottery ranging from 5% to 95%, with the first lottery winning chance of 50% was repeated twice.[16] The sequences of percentages are in the same order as that used by Harrison (1986) and Kachelmeier & Shehata (1992). To estimate the subject's risk attitudes, the expected

[15] 100 francs = 1.00 Canadian dollar.

[16] The first trial was considered as a learning round and was excluded from the analysis

value of the lottery for the 24 chances of winning a prize of 100 francs[17] were regressed on the subject's certainty equivalents and the certainty equivalents squared using OLS. The t-value of the squared term is used as an estimate of subjects' risk preferences (Kachelmeier, 1990).

3.1.2 Eliciting Subjects' Value-Orientations

We used the *Decomposed (Ring) Game* mechanism developed by social psychologists (see, e.g., Griesinger and Livingston, 1973 and Liebrand, 1984) to measure subjects' value orientations.[18] In this game, each subject was paired at random with an anonymous person from the same room throughout the course of the game. The subjects were told that neither of the two persons who were paired together would receive any information about the other person's decisions during the session, and vice versa.

Each subject was presented with twenty-four randomized pairs of adjacent coordinates to choose from. Each pair allocates an amount of money to the decision-maker and another amount to be paid to the anonymous paired-subject, where each pair affects the well-being of the two subjects differently. An example of a pair of choices is given below[19]:

Option A		**Option B**	
You Receive	*Other Receives*	*You Receive*	*Other Receives*
26	97	50	87

The 24 pairs of choices lie equally spaced on a circle with the origin of the outcome plane serving as center of zero and a radius of 100 laboratory Lira (please see Figure 2). The

[17] We added two more hypothetical chances: Zero percent and 100%. See Kachelmeier (1990) for detailed discussion on this point.

[18] The *Decomposed Game* technique has been used in prior studies investigating individuals' behavior in prisoners' dilemma games and individuals' voluntary contributions towards the provision of public goods (see e.g., Offerman et al., 1996).

[19] All subjects are presented with the same choices.

horizontal axis indicates the amount of money allocated to oneself (x) and the vertical axis indicates the amount of money allocated to the other (y). Therefore, $x^2 + y^2 = 100^2$.

Figure 2 about here

The subject's payoff from this game is the sum of the amounts that he/she allocated to him/herself over the 24 choices plus the sum that the other person allocated to him/her. The motivational vector indicates the strength of the decision-maker's preference for his/her own well-being versus the well-being of others. The sum of the amount that the subject allocated to his/her anonymous partner divided by the sum that he/she allocated to himself/herself over the 24 choices provides an estimate of the individual's value orientation (see Buckley et al., 2001).

Based on observed preferred motivational vectors, individuals can be classified into five categories. Individuals with vectors lying between 67.5 and 112.5 degrees are classified as *altruistic* who want the best for others even at the expense of their own well-being. On the other extreme, individuals with vectors between degrees -112.5 and -67.5 are classified as *aggressive*, who want the worst for others even at the expense of their own well-being. The middle positions are held by *cooperators* with vectors between 22.5 and 67.5, who pursue the best for both themselves and others; and *individualists* with vectors between -22.5 and 22.5, who try to decide what is best for themselves regardless of others; and finally the *competitors* with vectors between -67.5 and -22.5, who desire to be better off than others[20].

[20] Alternatively, the value orientation index can be measured as the slope of the line, by dividing the total amount each subject assigned to his/her counterpart by the total amount assigned for his/her-self.

3.2 The Second Experimental Session (*Playing the Investment Game*)

The experimental design used in this study is a **3 x 2** factorial design. The first factor is *within-subject*, which involves an examination of the incremental impact of repeated interaction game and the power to veto the receiver's allocation decision over the base line of one-shot investment game used in previous studies. The second factor is *between-subject*, which is the type of experiment, i.e., manual or computerized experimental environment.[21] A major concern in previous studies was how to maintain a high degree of privacy for subjects to truthfully reveal their actual behavior. To achieve this objective, previous studies implemented a double-blind procedure. In an attempt to maintain the highest level of privacy, the current study *computerized*[22] the experiment where there are no third party contacts in the information exchange between subjects. In order to compare our results with previous studies on one-shot investment games, we also we conducted the experiment manually. The experimental design is presented in Table 1 (Panel A).[23]

3.2.1 Manual Experiment

At the beginning of the experiment each subject was assigned an ID (i.e., their experimental identities) by drawing an index card from a set of shuffled cards numbered from 1 to N, where N is the total number of the students attending the session. Students were told that the ID number is private information and that they should not show it to or share it with any one. Those receiving a card numbered from [1 to (N/2)] were taken to another room to

[21] This treatment factor was used to further explore our interest in conditions that affect outcomes in various games context following Hoffman et al (1994).

[22] The computerized environment is identical to the manual environment (described in the Section 3.2.1) except that the transfer of information between the sender and the receiver was made electronically. Two groups of subjects (28 and 20 subjects) participated in the manual experiments and two groups (26 and 34 subjects) participated in the computerized experiment.

complete the experiment, whereas those receiving a card numbered from [(N/2) + 1 to N] remained in the same room. After separating the subjects in two different rooms, experimental instructions were distributed and read aloud. Subjects were given an opportunity to ask questions for clarification.

At the beginning of each period, subjects were endowed with 100 laboratory francs and were told whether they would assume the role of a Sender or a Receiver for the period. Senders were asked to make a decision about how much of their period endowment they wished to invest with their paired anonymous person. They were told that they have the choice of investing some, all, or none of their period endowment. They were instructed to write their decision on the proper line in the decision sheet, multiply that amount by three and place their decision sheet in an envelope. The research assistant designated for room 1 collected the envelopes and took them to the research assistant designated for room 2, who distributed the envelops to the Receivers. After the Receivers received their envelopes, they decided how much of the sum of their own endowment *plus* any tripled investment received to return to their counterparts. Receivers were instructed to write down the information on their profit sheet and place the decision sheet in the Senders' original envelopes. The research assistant for room 2 collected the envelopes from the Receivers and gave them to the research assistant for room 1, who returned them to the original Senders in the other room. The decision period was then concluded and subjects were ready to receive new instructions.

Figure 3 about here

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[23] The basic structure of the experimental setting is a variant of the trust game developed by Berg, Dickhaut and McCabe (1995).

3.2.2 Repeated Interactions

The incentives to build and maintain reputation is larger, more frequent the transaction, the longer the horizon, and more profitable the transaction (Milgrom and Roberts, 1992). In a repeated multi-period investment game, subjects will attempt to build reputation and send credible signals to their counterparts to maximize both individual and group gains. To test this relationship, we extended the one shot game to a repeated game.

After subjects completed the one shot game, they were told that they would be paired with a new person and that they would be playing the same role with that person for several periods. To avoid end game behavior, we deliberately did not tell subjects how many periods this pairing would last.

3.2.2 Fear of Retaliation

We examine whether the fear of retaliation would increase the level of cooperation, and hence achieve a higher level of trust and reciprocity. To manipulate this factor, we modified the standard investment game by allowing the senders to reject the receivers' allocation decisions. If they decided to reject the allocation decision, neither of the two players would receive any amount during that period.

3.3 Post-Experimental Questionnaires

At the end of the experimental session, subjects completed a short, post-experimental questionnaire. The purpose of this questionnaire was to collect background information as well as information concerning subjects' perceptions of the experiment. Lastly, subjects were paid and dismissed. [24]

[24] The average earnings per subject for the second session was $34 for a total average earnings of $58 over the two sessions.

4. Results

We present our results following the custom in the experimental economics literature, in that the overall ocular analysis is presented followed by the results of our statistical analyses. As well, the results follow the structure of the hypotheses in section 2 with the results from the analysis of trust decisions (hypotheses H1a – H5a) preceding the results from the analysis of reciprocity decisions (hypotheses H1b – H5b).

4.1 Ocular Analysis

Figure 4 Panel A, depicts trust and reciprocity levels (raw average) for the total sample under the three treatment conditions: one shot setting, the repeated interaction setting and the ultimatum (veto) setting. As predicted, trust and reciprocity levels increase under repeated interaction setting and the veto setting (exhibiting the highest observed levels of trust and reciprocity) compared to the one shot setting. Next we describe the trust and reciprocity levels stratified by gender.

Figure 4 about here

4.1.1 Trust Decisions

Figure 4 Panel B, depicts the trust levels (the raw average) for females and males under the three treatment conditions: one shot setting, the repeated interaction setting and the ultimatum (veto) setting. As predicted, trust levels increase under repeated interaction setting and the veto setting compared to the one-shot setting. The trust level of males is always higher than the trust level of females for each of the three treatment conditions and the difference between one shot setting and the repeated interaction setting is maintained, indicating that repeated interaction setting though increasing the trust level of females, it does not make it converge to the trust level of males. This indicates that reputational factors do not fully undo

the females' fear of trusting of others. However, under the ultimatum setting the difference in trust levels between females and males are reduced, indicating that countervailing veto power increases the propensity of females to trust.

4.1.2 Reciprocity Decisions

Figure 4 Panel C, depicts the reciprocity levels (the raw average) for females and males under the three treatment conditions: one shot setting, the repeated interaction setting and the ultimatum (veto) setting. As predicted reciprocity levels increase under repeated interaction setting and the ultimatum setting compared to the one-shot setting. This change in reciprocity levels across the experimental settings is not gender invariant. In the case of females, the reciprocity levels drop as we move from one shot to repeated settings and rise above observed one shot levels for veto setting, while in the case of males the increase is monotonic. Furthermore, as hypothesized, the reciprocity level of females is higher relative to males in the one-shot setting. However, the reciprocity levels of males are higher compared to females in the repeated interaction setting and the ultimatum setting.

4.2 Statistical Analyses

4.1.1 Descriptive Statistics

Table 1, Panel A, presents the number of observations in our **3x2** experimental design (please see Table 1, Panel A and Figure 3). For each experimentation method (i.e., manual and computerized environment), we conducted experiments in three distinct settings; namely the one-shot investment game, the repeated interaction investment game and the repeated investment game with ultimatum setting.

Table 1, Panel B, reports descriptive statistics of the data from our experiments. The minimum value orientation score was –1.644 and the maximum was 1.78 with the mean score

of 0.461 indicating that our subjects were on average cooperative and that they fall in the three categories of cooperative, individualistic or competitive (please refer to Figure 2). We did not have subjects having extreme value orientations, i.e., altruism or aggression. The minimum risk score was –8.235 and the maximum score was 6.117 with the mean amount of 0.812 indicating that subjects had a wide range of risk preferences.

Table 1, Panel C, reports descriptive statistics of the average trust and reciprocity for the type of experiment (i.e., whether computerized or manual) by treatment conditions. Overall the mean trust level was 0.735. Even though the endowment is just one dollar per round relative to $5 - $10 amounts used in most previous experiments involving one-shot investment games, the average trust level for the one-shot game is 0.625 which is comparable to previous studies which had a range of 0.52 – 0.68 (see for example, Berg et al. 1995; Corson and Buchan, 1999; Chaudhuri and Gangadharan, 2002) indicating that our results are not biased by the endowment level. The mean reciprocity level for the one-shot game was 0.25, which is also consistent with the reciprocity levels reported in prior studies (0.25 – 0.31).

Table 1 about here

4.2.2 Trust Decisions

To test the research hypotheses stated in Section 2, we performed Analysis-of-Covariance (ANCOVA). The dependent variable in the trust analysis is:

trust level = (the amount invested by the sender) / (the period endowment)

To minimize the potential learning effect over time, the *trust level* is measured as the average response of each subject over the number of repeated periods of each treatment.

The first three hypotheses (H1a – H3a) are directed at examining whether personal attributes (more specifically value orientation and risk preferences) and gender influence the level of trust in the investment game. The ANCOVA results for the trust analysis are presented in Table 2. We find evidence that the trust level increases with risk tolerance thereby confirming that trust involves risk bearing by senders and so we can reject the null hypothesis H1a.[25] Further, value orientation is significant implying that competitors will not invest and expect others will not either; that individualists will invest if it is rewarding and expect the same from others; and that cooperators will invest and expect other to do likewise and so we can reject the null hypothesis H2a.

Table 2 about here

Table 2, also shows that gender is a significant factor in trust decisions, a finding that enables us to reject the null hypothesis H3a and is consistent with prior evidence (Cox and Deck, 2002; Chaudhuri and Gangadharan, 2002). This is an interesting result, since even after explicitly controlling for risk attitudes which has been stated as the main reason for the difference in trust levels among males and females, we find gender to be a incrementally significant factor in determining the trust level, implying that there are factors other than risk attitudes driving the difference in trust decisions of females and males.

As expected, the factor representing various treatments (one-shot setting, repeated interaction setting and ultimatum setting) is also significant in determining the trust level, motivating a detailed analysis in Table 3, Panel A. Furthermore, the interaction between gender and treatment is significant, indicating that females and males make significantly

[25] In a recent study, Eckel and Wilson (2004) in a different context report no statistically significant results between risk measures and the level of trust, in contrast to our strong statistically significant results.

different trust decisions under different treatment conditions, motivating a further investigation of the gender differences under different treatment conditions in Table 3, Panel B.

Table 3 about here

Table 3, Panel A presents the estimated marginal means of the main effects for the trust decisions. As predicted, the trust levels under repeated interactions are significantly higher relative to one-shot game settings, providing evidence to reject the null hypothesis H4a that the propensity to maximize is muted in any given period in that the subjects use a multi-period frame for payoff maximization.[26] Furthermore, the highest trust levels are observed under the ultimatum setting and are significantly different from one-shot game setting and repeated interaction setting, thereby rejecting the null hypothesis H5a. This suggests that the presence of countervailing power in game theoretic/ bargaining contexts enables cooperative behavior and tempers extreme self-interested behavior.[27]

Table 3, Panel B reports the trust levels for females and males separately for different treatment conditions. In the one-shot game setting, males tend to trust more than females. Females' trust decisions also are unchanged under repeated interactions suggesting that reputational effects are not enough to eliminate their fear to trust the other party. However, there is a significant increase in trust levels of females under the ultimatum setting compared to both one-shot and repeated games. This implies that the low levels of trust by females may be due to their fear of falling into a "sucker" role. Therefore when females are given the

[26] This evidence is consistent with Cochard, Van and Willinger (2004) results obtained within the context of a finitely repeated investment game.

[27] It should be noted that the countervailing power could manifest within persons or institutions. In this study, countervailing power is vested within the individual. Future work will examine implications of countervailing power vested with institutions.

opportunity to retaliate or punish in the ultimatum setting, the fear of being taken advantage disappears and a sense of empowerment prevails which results in an increase in trust levels comparable to trust levels of males. [28]

4.2.3 Reciprocity Decisions

We performed Analysis-of-Covariance (ANCOVA), similar to the analysis on trust decisions, to test the research hypotheses stated in Section 2 on reciprocity decisions. The dependent variable in the reciprocity analysis is:

reciprocity level = (amount returned by the receiver) / (the period endowment + the tripled amount invested by the sender)

To minimize the potential learning effect over time, the *reciprocity level* is measured as the average response of each subject over the number of repeated periods of each treatment.

Table 4 Panel A, presents the ANCOVA results for the reciprocity decision. The first three hypotheses (H1b – H3b) are directed at examining whether personal attributes (more specifically value orientation and risk preferences) and gender influence the level of reciprocity in the investment game. It should be noted that hypothesis H1b was stated for the sake of completeness in that in the one shot game setting risk preferences do not influence reciprocal behavior. The value orientation score is significant which enables the rejection of null hypothesis H2b at conventional levels of significance. Moreover, the beta estimate for covariates reported in Table 4 shows that value orientation has a positive impact on the level of reciprocity supporting the rejection of null hypothesis H2b. Table 4, also shows that gender is not a significant factor in reciprocity decisions, a finding that fails to reject our null hypothesis H3b.

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[28] Although there is still a statistically higher level of trusting behavior by males compared to females in the veto setting, the mean difference dropped substantially compared to one-shot setting and repeated interaction setting.

Table 4 about here

As expected, the factor representing various treatments (one-shot setting, repeated interaction setting and ultimatum setting) is also significant in determining the level of reciprocity, motivating a detailed analysis in Table 5.

Table 4 Panel B, presents the ANCOVA results for the reciprocity decision controlling for the influence of trust levels exhibited preceding the reciprocity action. McCabe et al. (2003) argue that receivers consider the amount invested by the sender (or investor) in the determination of the amount to be reciprocated to the sender (or investor). From the perspective of the receiver (or allocator) differential choice of trust levels by senders (or investors) might embed a signal of differential propensity to cooperate, which in turn, stimulates differential reciprocal behavior. The results show the level of trust (i.e., trust index) is the most important determinant of observed reciprocity levels. As seen in Table 4 Panel A, value orientation remains a significant determinant of reciprocity levels even after the introduction of trust level, whereas treatment condition is no longer significant.

Table 5 about here

Table 5, presents the estimated marginal means of the main effects for the reciprocity decisions. Although the reciprocity levels under repeated interactions are higher relative to one-shot game settings, they are not statistically significant and so we have weak evidence to reject the null hypothesis H4b, implying that the need for reputation building may drive higher level of reciprocity. The reciprocity level in the ultimatum setting is higher relative to

the corresponding one-shot game setting enabling the rejection of hypothesis H5b. This behavior may be due to the fear of retaliation by the original senders.

4.3 Sensitivity Analyses

As shown in Figure 3, each subject played the role of sender and receiver in each of the three settings (i.e., one-shot, repeated and ultimatum). To control for this order effect in the role playing by the subjects, we explicitly included an order variable in the statistical model. In addition, we conducted a non-parametric t-test on the mean difference between subjects' trust and reciprocity levels when they assumed roles as senders first with their counterparts who played as receivers first and found no statistical difference in trusting and reciprocal behaviors.[29] Therefore the order of playing the game did not have any impact on subject's behavior in all of the three settings.

A potential shortcoming of our design is that the order in which the participants received the three treatments was not counterbalanced. As a test of robustness of our results, we carried out an additional session of computer experiments where 26 subjects played the game backward, i.e., first play the one-shot game, then the ultimatum game and finally the repeated interaction game to check whether our results are driven by treatment order. The results of the raw means for each of the setting and their relative values for our original computerized data (with 60 subjects) are reported in Table 6. The differences in raw means for playing the game forward (as in Figure 3) and backward (Table 6) are not statistically significant. These results are consistent with the view that treatment order effects do not drive our experimental results.

[29] We do not report these results since there was no statistical difference.

5. Conclusions

This study makes two methodological extensions to the standard investment game in an attempt to better understand the forward induction behavior. First, we allow participants to send signals to their counterparts in a repeated interaction game to build higher levels of trust and reciprocity. Second, we provide the investor with the power to veto the receiver's allocation decision, thereby enabling pricing of the power of retaliation and salience of reciprocal behavior. We also investigate the influence of certain personal attributes of individuals on trust and reciprocity in this study. Extant literature has mainly focused on contextual factors that drive the underlying behavior of trust and reciprocity. The current study attempts to directly measure certain individual characteristics that are expected to influence the level of trust and reciprocity. This enables us to empirically assess the importance of these variables in explaining the base-line level of trust and reciprocity. By doing so, we attempt to unlock the "black box" of trust-reciprocity decision process. In addition, we also examine the role of gender on trust and reciprocity

We make several contributions to the literature. We provide evidence that value orientation and risk preferences are important drivers of the base level trust and reciprocity. This is significant as results in prior studies noting deviations from game theoretic predictions do not control for innate characteristics such as value orientation and risk. We find evidence that the trusting behavior is sensitive to reputation building, i.e., under repeated interaction setting subjects have higher trusting behavior relative to the one-shot setting.

As a methodological refinement, we are able to price the power of veto in an investment game setting thereby enabling a greater understanding of behavior within the context of forward induction. The trust and reciprocity levels are highest under the 'veto' setting indicating that participants value and are able to price the power of retaliation.

Furthermore, we provide evidence that gender is an important factor in trust decisions. We also find that the behavior of males and females under one-shot setting and repeated interaction settings are substantially different. Therefore inferences on trust from the aggregate behavior without distinguishing gender may be misleading.

The implications of these results are wide-ranging, particularly at this time of market and organizational turmoil characterized by bruised trust levels. Our evidence indicates that trust and reciprocity levels are influenced both by social values and economic incentives. Thus understanding the interactions of personal attributes with pure economic incentives may lead to alternative incentive control systems which may be more efficient than those that focus solely on contracting and direct monitoring systems.

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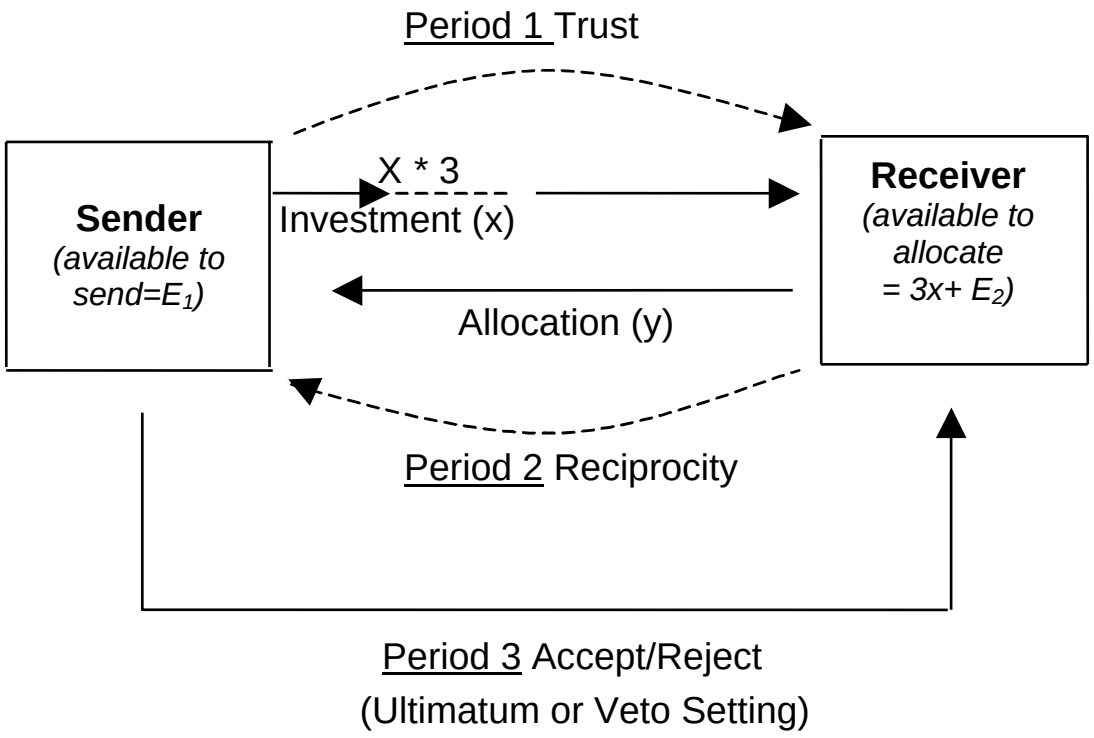
Figure 1

Modified Investment Game



Variable Definitions

E_1 – Initial Endowment of the Sender

E_2 – Initial Endowment of the Receiver

x – $ amount invested by the Sender

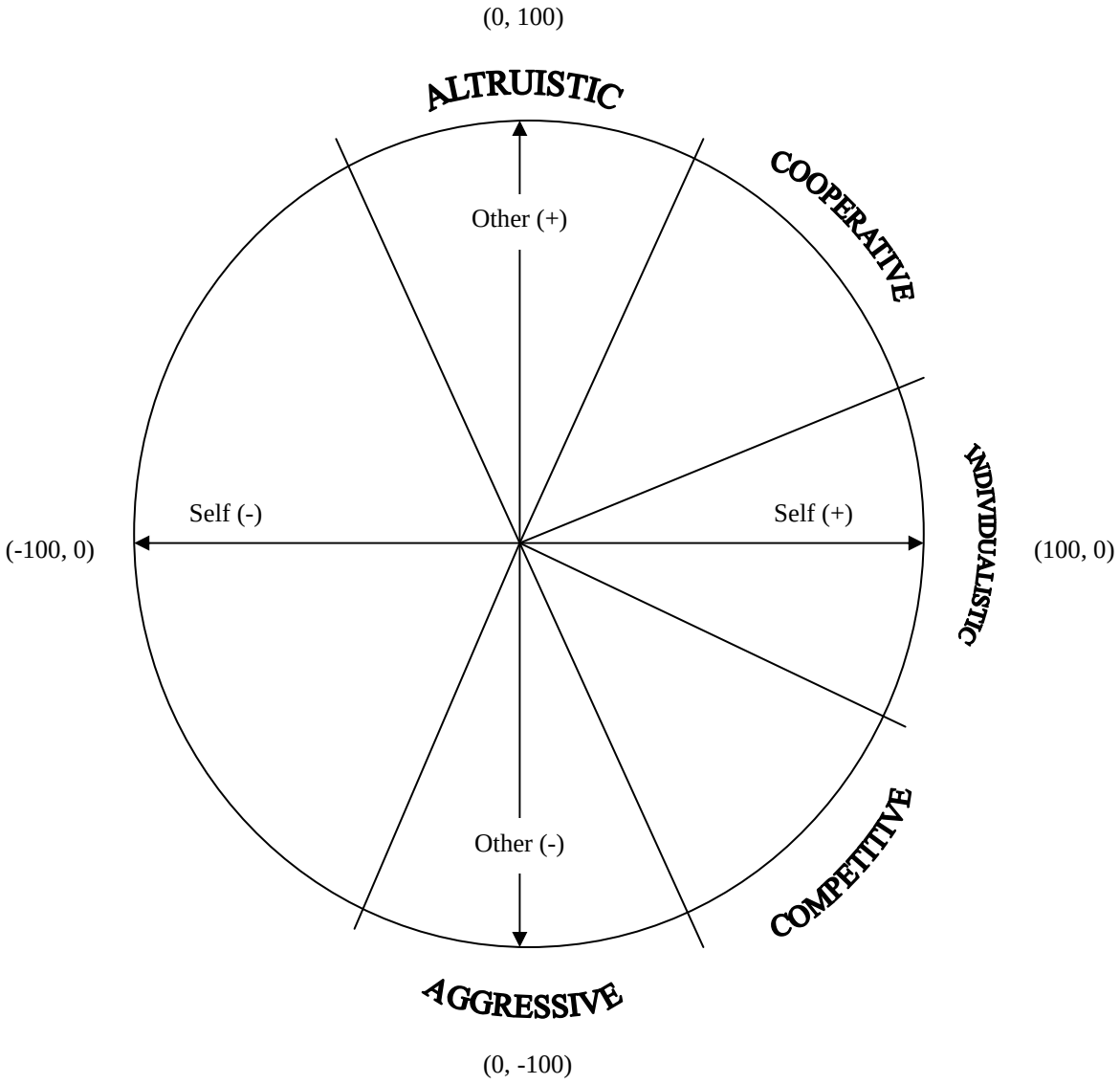
y – $ amount returned by the Receiver

Level of Trust (Trust) $= x / E_1$

Level of Reciprocity (Reciprocity) $= y / (E_2 + 3x)$

Figure 2

The Value Orientation Circle

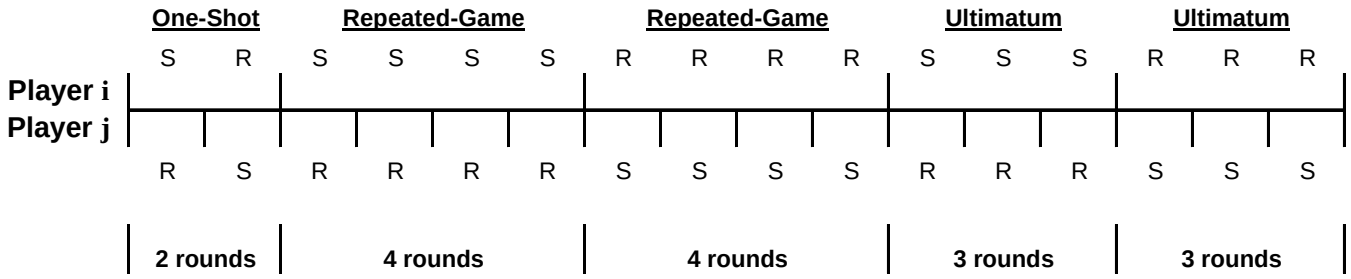


Value Orientation Categories

ALTRUISTIC = Individuals with vectors lying between 67.5 and 112.5 degrees.
COOPERATIVE == Individuals with vectors lying between 22.5 and 67.5 degrees.
INDIVIDUALISTIC= Individuals with vectors lying between -22.5 and 22.5 degrees.
COMPETITIVE= Individuals with vectors lying between -22.5 and -67.5 degrees.
AGGRESSIVE= Individuals with vectors lying between -67.5 and -112.5 degrees.

Figure 3

Experimental Phases

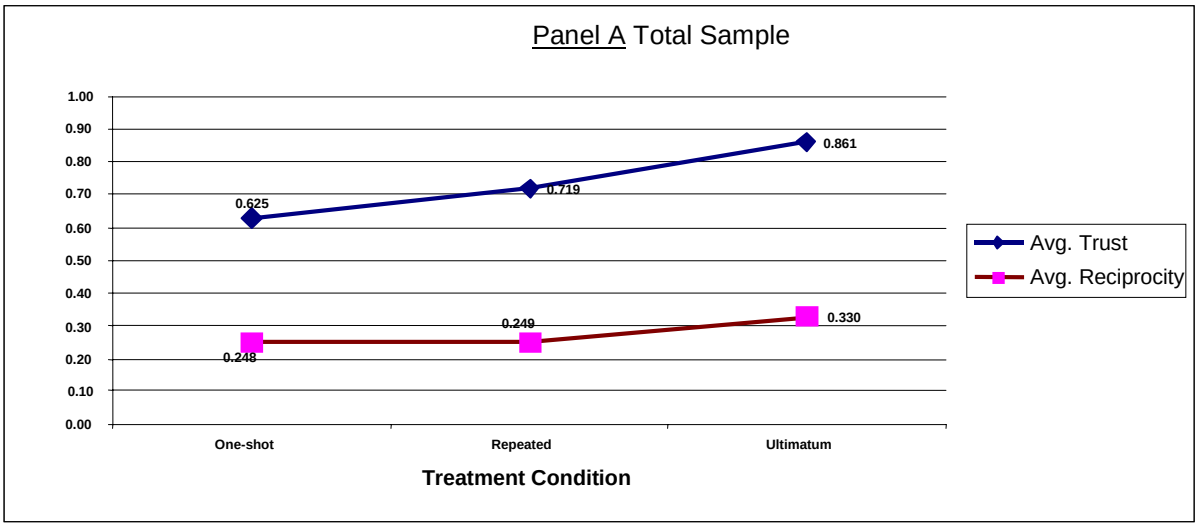


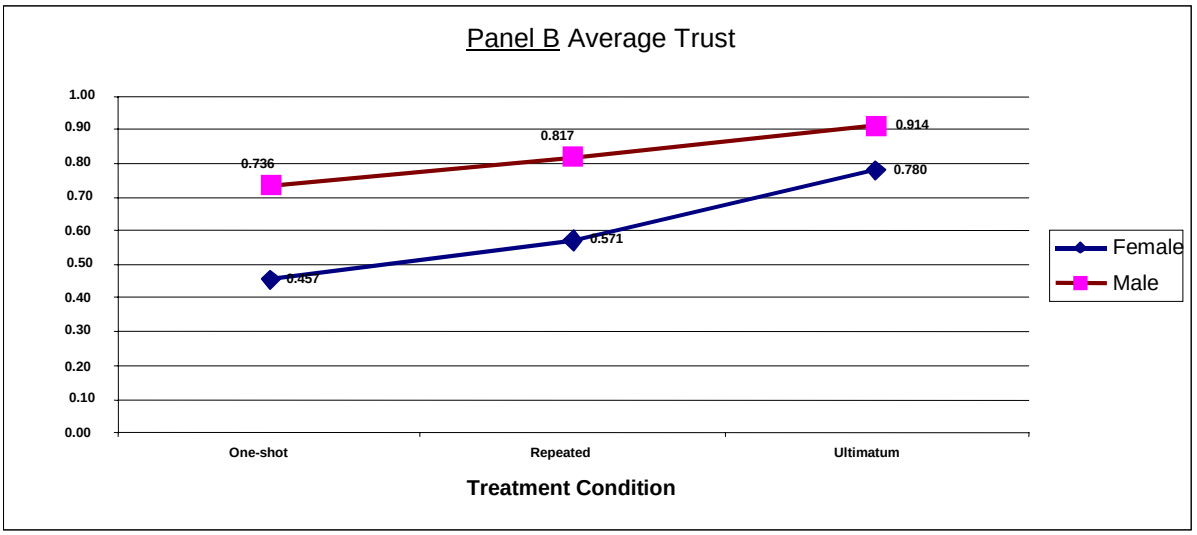
Variable Definitions

S = a subject assumes the role of Sender.

R = a subject takes the role of Receiver.

Figure 4
Average Raw Data for Trust and Reciprocity





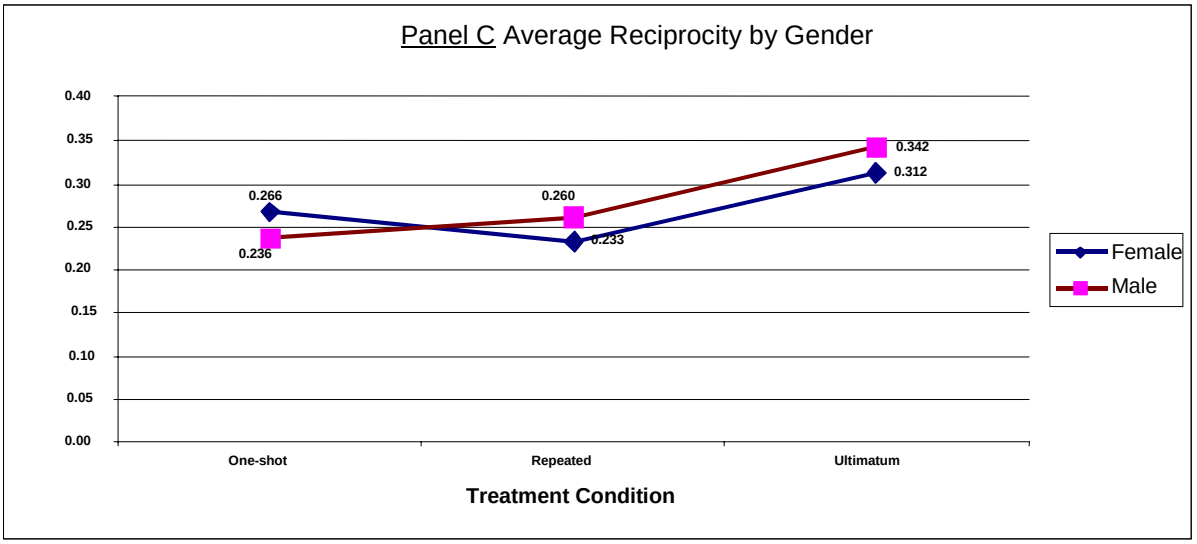


Table 1

Experimental Design & Descriptive Statistics

Panel A: Experimental Design

Within Subjects Treatment	Between Subjects Treatment	
	Manual	**Computerized**
One-shot game[a]	48*	60*
Repeated game (same partner)[b]	48*	60*
Repeated game (Ultimatum)[c]	48*	60*

* Number of observations in each cell**.**

a. One-shot game, where each subject is paired at random with another subject to play the investment game for only one time.

b. Repeated game, where each subject is paired at random with new partner to play the investment game with the same partner for several rounds.

c. Repeated game (ultimatum), where each subject is paired at random with new partner to play the investment game for several rounds with the same partner. In this setting, the sender is given the opportunity to accept or reject the allocation decision of the receiver. If sender rejected the allocation, neither of the two players receives anything from the money to be allocated, otherwise the money will be allocated as proposed by the receiver.

Panel B: Descriptive Statistics

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Average Trust	108	0.000	1.000	0.735	0.274
Average Reciprocity	108	0.000	1.000	0.276	0.251
Value Orientation*	108	-1.644	1.780	0.461	0.546
Risk Attitude	108	-8.235	6.117	0.812	2.284

* Value Orientation index is measured in terms of the slope of the line, by dividing the sum of the amount assigned by a subject to his/her counterpart by the sum of the amount assigned to him/her-self.

Panel C: Between-Subjects Factors

	Trust			**Reciprocity**		
Treatment	**Computer**	**Manual**	**Total**	**Computer**	**Manual**	**Total**
One-Shot Game	0.591	0.668	0.625	0.248	0.248	0.248
Repeated Game (Same Partner)	0.732	0.704	0.719	0.205	0.304	0.249
Repeated Game (Ultimatum)	0.879	0.837	0.861	0.318	0.346	0.330
Total	0.734	0.736	0.735	0.257	0.299	0.276

Table 2

Analysis of Covariance for Trust Decision

Source	**Type III Sum of Squares**	**d.f.**	**Mean Square**	**F-value**	**Sig.**	**Beta Coff. of Covariance**
Intercept	74.134	1	74.134	1580.865	0.000	
Value Orientation	1.353	1	1.353	28.858	0.000	0.119
Risk Preference	0.863	1	0.863	18.409	0.000	0.023
Type of Experiment	0.112	1	0.112	2.397	0.123	
Treatment Conditions	3.080	2	1.540	32.844	0.000	
Gender	1.736	1	1.736	37.030	0.000	
Order	0.069	1	0.069	1.470	0.226	
Type * Treatment	0.170	2	0.085	1.812	0.165	
Type * Gender	0.037	1	0.037	0.781	0.378	
Treatment * Gender	0.288	2	0.144	3.073	0.048	
Type * Treatment * Gender	0.115	2	0.057	1.226	0.295	
Corrected Model	9.799	14	0.700	14.926	0.000	
Error	14.490	309	0.047			
Total	199.320	324				
Corrected Total	24.290	323				
Adjusted R Squared = 0.376						

Table 3

Estimated Marginal Means of Trust Decision

Panel A: The Main Effects of Trust Decision [a]

Factors	**Mean**		**Mean Difference**	**Sig. Level [b]**
	Level (J)	**Level (K)**	**(K- J)**	
Treatment Conditions:				
One-Shot vs. Repeated	0.603	0.689	0.086	0.018
Repeated vs. Ultimatum	0.689	0.851	0.161	0.000
One-Shot vs. Ultimatum	0.603	0.851	0.247	0.000
Gender:				
Female vs. Male	0.631	0.798	0.166	0.000
Type of Experiment:				
Manual vs. Computerized	0.695	0.734	0.039	0.123
Order:				
Sender First vs. Receiver First	0.700	0.729	0.029	0.226
a. Evaluated at the estimated average covariates appeared in the model: Value orientation = 0.456 and Risk attitude = 0.737				
b. Adjusted for multiple comparisons using Bonferroni.				

Table 3 (Continued)

Panel B: The Interaction between Gender and Treatment of the Trust Decision [a]

Factors	**Female**		**Male**		**Mean Diff.**	
	Mean	**Stand. Error**	**Mean**	**Stand. Error**	**Male vs. Female**	**t-value**
Treatment Conditions:						
One-Shot	0.496	0.035	0.711	0.027	0.215	6.98*
Repeated	0.586	0.035	0.792	0.027	0.206	6.68*
Ultimatum	0.812	0.035	0.890	0.027	0.078	2.53*
	Mean Difference	**t-value**	**Mean Difference**	**t-value**		
Repeated vs. One-Shot	0.091	2.60*	0.081	3.00*		
Ultimatum vs. Repeated	0.226	6.46*	0.097	3.59*		
Ultimatum vs. One-Shot	0.316	9.02*	0.179	6.63*		

a. Evaluated at the estimated average covariates appeared in the model:
Value orientation = 0.456 and Risk attitude = 0.737

Notes

* = The mean difference is significant at the .01 level or better

** = The mean difference is significant at the .05 level.

*** = The mean difference is significant at the .10 level.

Table 4

Analysis of Covariance for Reciprocity Decision

Panel A: Without the Trust Index

Source	Type III Sum of Squares	df	F	Sig.	Beta
Intercept	10.448	1	173.704	0.000	
Value Orientation	0.732	1	12.172	0.001	0.088
Treatment Conditions	0.401	2	3.334	0.037	
Type of Experiment	0.096	1	1.595	0.207	
Gender	0.018	1	0.306	0.581	
Order	0.019	1	0.314	0.576	
Treatment * Type	0.135	2	1.124	0.326	
type * gender	0.053	1	0.877	0.350	
Treatment * Gender	0.032	2	0.264	0.768	
Treatment *Type * gender	0.026	2	0.212	0.809	
Corrected Model	1.639	13	2.097	0.014	
Error	18.646	310			
Total	44.923	324			
Corrected Total	20.285	323			
Adjusted R Squared = .042					

Panel B: With the Trust Index

Source	Type III Sum of Squares	df	F	Sig.	Beta
Intercept	0.000	1.000	0.008	0.931	
Value Orientation	0.544	1.000	10.184	0.002	0.076
Trust Index	2.148	1.000	40.239	0.000	0.330
Treatment Conditions	0.062	2.000	0.580	0.560	
Type of Experiment	0.113	1.000	2.125	0.146	
Gender	0.093	1.000	1.748	0.187	
Order	0.065	1.000	1.223	0.270	
Treatment * Type	0.189	2.000	1.770	0.172	
type * gender	0.036	1.000	0.671	0.413	
Treatment * Gender	0.113	2.000	1.057	0.349	
Treatment *Type * gender	0.019	2.000	0.173	0.841	
Corrected Model	3.788	14.000	5.068	0.000	
Error	16.498	309.000			
Total	44.923	324.000			
Corrected Total	20.285	323.000			
Adjusted R Squared = 0.15					

Table 5
Estimated Marginal Means of Reciprocity Decision

Factors	**Mean**		**Mean Difference**	**Sig. Level[b]**
	Level (J)	**Level (K)**	**(K- J)**	
Treatment Conditions:				
One-Shot vs. Repeated	0.249	0.254	0.006	1
Repeated vs. Ultimatum	0.254	0.330	0.076	0.096
One-Shot vs. Ultimatum	0.249	0.330	0.081	0.074
Gender:				
Female vs. Male	0.286	0.270	-0.016	0.581
Type of Experiment:				
Manual vs. Computerized	0.296	0.260	-0.036	0.207
Order:				
Sender First vs. Receiver First	0.285	0.270	-0.015	0.576
a. Evaluated at the estimated average covariates appeared in the model: Value orientation = 0.456				
b. Adjusted for multiple comparisons using Bonferroni.				

Table 6
Treatment order effects (Raw Means)

Panel A: Average Trust

Factors	Average Trust				
	Forward (N=60)	Backward (N=26)	Mean Difference	t-value	Sig. Level
One-Shot	0.590	0.651	-0.0617	-0.963	0.338
Std. Dev.	0.252	0.316			
Repeated	0.712	0.688	0.0240	0.383	0.703
Std. Dev.	0.247	0.312			
Ultimatum	0.843	0.867	-0.0242	-0.489	0.626
Std. Dev.	0.191	0.252			

Panel B: Average Reciprocity

Factors	Average Reciprocity				
	Forward (N=60)	Backward (N=26)	Mean Difference	t-value	Sig. Level
One-Shot	0.308	0.333	-0.0250	-0.446	0.657
Std. Dev.	0.241	0.233			
Repeated	0.374	0.337	0.0370	1.142	0.257
Std. Dev.	0.120	0.173			
Ultimatum	0.452	0.436	0.0156	0.774	0.441
Std. Dev.	0.063	0.124			

Notes:

1. *Forward* implies the following treatment sequence: One-shot, Repeated and Ultimatum.
2. *Backward* implies the following treatment sequence: One-shot, Ultimatum and Repeated.