Cooperation in Social Dilemmas, Trust and Reciprocity [1,2]

Ananish Chaudhuri *
Department of Economics
Wellesley College
&
Department of Economics
Washington State University

Barry Sopher
Department of Economics
Rutgers University

Paul Strand
Department of Psychology
Washington State University

*** Corresponding author:** **Ananish Chaudhuri**
Department of Economics
Washington State University
2710 University Drive
Richland, WA 99352
Phone: 509-372-7238
Fax: 509-372-7512
E-mail: achaudh@tricity.wsu.edu

[1] Each author contributed equally. They have been listed in alphabetical order following the usual convention in Economics.

[2] We thank Paula Culvershouse for enormous assistance in running the experiments for the paper. Thanks to Brandi Goble, Kathy Velasquez and Steve Baer for their assistance as well. We thank Andreas Ortmann, Hans Normann, and seminar participants at the Annual Economic Science Association Meetings in New York, June 2000, Washington State University and Williams College for valuable comments and feedback. We would like to express our sincerest thanks to two anonymous referees and the Editor (Simon Kemp) for excellent feedback. The paper is much improved due to the insight provided by them. We gratefully acknowledge financial assistance from the Rutgers University Research Council. The usual disclaimer applies.

Cooperation in Social Dilemmas, Trust and Reciprocity

ABSTRACT

The present study attempts to connect cooperative behavior in the repeated play prisoner's dilemma with "trusting" and "reciprocal" behavior. Our goal is to see if people with different propensities to cooperate exhibit differing degrees of trust and reciprocity. We find the subjects who choose to cooperate in a repeated play prisoner's dilemma game exhibit higher levels of trust. However when it comes to reciprocal behavior, cooperating subjects do not behave differently than subjects who choose to defect.

JEL Classification: C72, C91, D83

PsycINFO Classification: 2360

Keywords: Repeated Play Prisoner's Dilemma, Cooperation, Trust, Reciprocity

1. Introduction

The null hypothesis of game theory is that humans are self-interested and seek to maximize only their monetary pay-offs or their utility which depends only on those monetary payoffs. However actual behavior very often deviates from this *homo economicus* assumption. In recent years economists have come to recognize that emotional dispositions or factors such as "trust", and/or "reciprocity" play important roles in strategic decision-making situations. See Cox (2000), Berg, Dickhaut and McCabe (1995), Bolton and Ockenfels (2000), Fehr et al (1993, 1996, 1997, 2000), Fehr and Schmidt (1999), Falk and Fischbacher (1999), Glaeser et al (2000), Gneezy et al (2000) among others.

Consider the investment game experiment described in Berg, Dickhaut and McCabe (1995). This is a game where two players are paired anonymously. One player is designated the sender and the other player the receiver. The sender is given a certain sum of money and told that she can keep the entire amount or split it with an anonymous receiver. Any amount that the sender offers to the receiver will, however, be tripled by the experimenter. This tripled amount is then given to the receiver. The receiver is told that she is free to keep the entire amount or, if she wants, she can send some or all of it back to the anonymous sender. The game ends after this point. The resolution of this game using backward induction is simple. In a 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, actual behavior is quite different from the one predicted above. In Berg et al's original experiments, out of an initial endowment of $10.00, senders, on

average transfer $5.16 to the anonymous receivers. Receivers in turn, instead of keeping all the money offered to them, return non-trivial amounts. “Investments of $5.00 had an average payback of $7.17, while investments of $10.00 had an average payback of $10.20.” (Berg et al , 1995, pp.131)

Subsequent researchers have come to rationalize this deviation in the following way. The behavior of the sender in this game is said to exhibit “trust”. See Cox (2000) and Gneezy et al (2000) among others. However this trust is neither unconditional nor context-free, but, rather, based on expected reciprocation by the receiver. If the sender reposes some trust in the receiver by transferring some or all of the initial endowment of $10.00 (which is tripled by the experimenter), and the receiver reciprocates that gesture by sending some money back, then there is the potential of arriving at Pareto-superior splits where both the sender and the receiver are better off than if the sender keeps the entire initial endowment to herself.

Consistent with the notion of expected reciprocation, people are often willing to pay a price (forego some non-trivial monetary pay-off) to reward those who have been generous to them or to punish those who have behaved selfishly. This behavior is inconsistent with the homo economicus assumption and, therefore, may represent a class of behavior motivated by a different principle, the *homo reciprocans* assumption. For an overview of evidence and an excellent discussion see Fehr & Gächter (2000). Also see Abbink et al (2000) for distinctions between positive and negative reciprocity (the latter referred to as “retribution” by the authors) and how behavior is different with regard to these.

A growing body of research suggests that "social capital" as embodied in the tendencies to "trust" and to "reciprocate" influence a wide range of economic phenomena and activities. La Porta, Lopez-de-Silanez, Shleifer and Vishny (1997), looking at data for a cross-section of countries, comment "Holding per capita GNP constant, a standard-deviation increase in trust raises judicial efficiency by 0.7, the anti-corruption score by 0.3, bureaucratic quality by 0.3 and tax compliance by 0.3 of a standard deviation. … Furthermore, a standard-deviation increase in trust raises participation in civic activities by 0.7 and participation in professional associations by one standard-deviation.". (La Porta et al, 1997, pp. 335) Fukuyama (1995) writes at length about the importance of trust in facilitating the workings of large-scare organizations, including governments, and the importance of trust in economic transactions in the absence of completely specified contracts which may not always be feasible (such may be the case for many transactions on the Internet for instance). See Glaeser et al (2000) for a discussion of some of the relevant literature which connects social capital and various economic phenomena. Also relevant here is the voluminous literature on voluntary contributions mechanisms. See Ledyard (1995) for a review of public goods experiments where similar conditional trust, based on expected reciprocation by group members, come into play. Using the standard game theoretic methodologies, it is hard to explain such "trusting" or "reciprocal" behavior in one-shot games with anonymous pairings.

We know that experimental subjects in a wide variety of experiments exhibit notions of trust and reciprocity. We also know from the evidence in a variety of bargaining and public goods games that there are heterogeneous subjects in these

experiments who behave in very different ways. In Berg et al's original experiments not all the senders exhibit the same amount of trust. Out of the 32 senders, 5 subjects transfer all of their $10.00 to the receiver while 2 subjects send nothing and the others send varying amounts in between. Also see the experiments by Cox (2000), Gneezy et al (2000), Abbink et al (2000) and Mckelvey and Palfrey (1992). The question which remains unanswered here is the following: Are there fundamental differences in the value orientation of people which makes them take very different decisions in identical circumstances which involve trusting a stranger? Do subject characteristics predict the choices that subjects make in these experiments? More importantly, are there behavioral cues that we can look for in order to predict a subject's attitudes towards trust? As Glaeser et al (2000, pp. 840) point out "to determine whether someone is trusting, ask him about specific instances of past trusting behavior. To determine whether someone is trustworthy, ask him if he trusts others". Likewise we are interested in finding behavioral clues which would predict trusting behavior in a subject. For similar arguments about behavioral perspectives, see Rachlin (1989).[1]

In order to elicit information about subject attitudes we turn to the Prisoner's Dilemma, perhaps the most studied social dilemma of its kind. While individual rationality, as embodied in individual pay-off maximization, suggests one strategy in this game, considerations of maximizing total group payoff suggest a different course. Trust has long been discussed in connection with general cooperative behavior. See Deutsch (1973). Studies have also shown it to be related to social dilemma behavior. See Messick et al (1983), Parks et al (1996) and Parks and Hulbert (1995). Parks et al (1996) look at

[1] The feedback provided by an anonymous referee was extremely helpful in formulating the arguments

how messages expressing cooperative intentions impact upon trust which in turn leads to increased cooperation. Parks and Hulbert (1995, pp. 719) comment, “basically it will be the case that those who trust others to “do the right thing” (cooperate) will show high rates of cooperation over time, compared to those who have low trust of others.” Pruitt and Kimmel (1977) argue that the degree of one’s trust in others is the primary factor in long-term interdependencies. Many of these authors, including Parks and Hulbert (1995), Parks et al (1996), find that higher levels of trust lead to increased cooperation in social dilemmas.

The present study attempts to connect behavior in the repeated play prisoner’s dilemma (RPPD) with “trusting” and “reciprocal” behavior. Our goal is to see if people with different propensities to cooperate exhibit differing degrees of trust and reciprocity. It was predicted that behavior in the prisoner’s dilemma could serve as a clue to subsequent tendencies to trust and reciprocate and the latter, in turn, would be influenced by the nature of individuals' experience in a prior Repeated Play Prisoner' s Dilemma (RPPD) game. Section 2 describes the design of the experiment. Section presents the results and section 4 concludes.

2. Experimental Design

In the present study, 90 subjects participated in a repeated play Prisoner’s Dilemma (RPPD) game against a confederate of the experimenter. Experimental subjects were faced with a Prisoner’s Dilemma Game shown in Table 1. Player #1 is the experimenter’s confederate while Player #2 is the subject. The strategies Cooperate and Defect were re-named Red and Blue, respectively, to make them context free. Each

---

presented here.

subject played against the same experimenter's confederate. Each subject got to see only his or her own pay-off in each cell. This number is shown in bold. Payoffs are denoted in U.S. cents.

TABLE 1

		Player #2 (Subject)	
		Cooperate (Red)	Defect (Blue)
Player #1 (Experimenter's Confederate)	Cooperate (Red)	50, **50**	10, **80**
	Defect (Blue)	80, **10**	20, **20**

The subjects played 10 practice rounds and 20 rounds for actual money. The subjects were not told how many actual money rounds there would be. They were simply told that there would be a number of rounds and they will be informed when the game ends.

Subjects were randomly assigned to (1) a tit-for-tat (TFT) treatment (60 subjects) and (2) a random (RAN) treatment (30 subjects).[2] The TFT treatment entails cooperating (playing Red) by the confederate on the first round and then repeating on round t + 1 what the subject played on round t. In the RAN treatment the confederate cooperated or defected according to pre-determined sequence based on numbers picked from the random number table. Here the confederate's strategy is independent of past choices

[2] Howard Rachlin and associates (See Baker and Rachlin, 1999, Brown and Rachlin 1999, and Silverstein et al, 1998) have carried out extensive research analyzing reciprocal behavior under the TFT and RAN treatment conditions.

made by the subject. Faced with TFT, the optimal strategy is to cooperate. Faced with RAN, the optimal strategy for a subject is to defect every round.

The instructions to the subjects do not involve deception. Subjects were told that the confederate would play according to a pre-determined strategy, which may or may not depend on their prior choices.

Following the RPPD game, each subject took part in a modified investment game first proposed by Berg, Dickhaut and McCabe (1995). Subjects were divided into equal sized groups of Senders and Receivers. Each Sender was given $5.00. Each Sender was told that they could keep the entire $5.00 or if they wished they could split it with an anonymous Receiver. However any amount they offered to the anonymous Receiver would be tripled by the experimenter. The anonymous Receiver then could decide to keep the entire amount of money offered or, if she wished, could send all or part of it back to the anonymous Sender. This latter amount is not tripled. The game then ends. For example if a Sender wished to keep $2.00 out of the initial $5.00 and offered $3.00 to the Receiver, then the Receiver would actually receive $9.00. The Receiver can then decide if she wishes to send any part of the $9.00 back to the Sender.

In a deviation from the original Investment Game, we had each subject make both a Sender and a Receiver Decision. For instance Subject #1 would make a Sender decision and offer a split to Subject #5 as the Receiver. At the same time Subject #1 would receive a split as Receiver from Subject #8 who is the Sender, and so on.

The following scheme illustrates the above point.

Room A		Room B	
Sender	**Receiver**	**Sender**	**Receiver**
1	5	5	2
2	6	6	3
3	7	7	4
4	8	8	1

This preserves the one-shot nature of the interaction since each subject interacts with a different subject in his or her role as a Sender and a Receiver and thus there is no scope for reputation building.

It is easy to see that a subject's decision at the Sender stage is a non-zero sum game since the Sender's loss is exceeded by the Receiver's gain as the split is tripled. Thus the cost of $1 of selfishness by the sender is greater than $1 for society as a whole and is analogous to contributions to a public good. The second or Receiver stage of the Investment Game can be thought of as a situation of zero-sum generosity since any amount sent back to the Sender comes out of the Receiver's payoff. In this case $1 selfishness by the receiver costs exactly $1 to society. The principle of backward induction suggests that the Receiver should send no money back in the zero-sum game stage since the game ends after this point. Knowing that, the Sender, interested in maximizing pay-off, should not offer any money to the Receiver in the first stage. However as discussed before, there is a different outcome of this game – one where the sender "trusts" the receiver and sends her some or all of the initial endowment and the receiver "reciprocates" that gesture by sending some money back. In this latter outcome

there is the potential for both the sender and the receiver to be better off than if the sender kept all of the initial endowment to himself.

Procedure.

There were a total of 90 undergraduate participants, all of whom participated in groups of 6 to 12 in a single-session experiment.

For each session, participants were gathered in a room where they had instructions read to them regarding the mechanics of the RPPD game. (A copy of the instructions is provided in the Appendix.) They then played the RPPD game. Each subject was given two cards – one with a red sticker and the other with a blue sticker corresponding to the two strategies. The confederate had two similar cards as well. Each play of the RPPD game against a subject was accomplished by the confederate approaching the subject at his table and then the confederate and the subject simultaneously turning over one of the two cards to display their choice for that round. Subjects were seated far apart so that none of them could see what the others were choosing. Once the round was over the subject noted his pay-off on the record sheet and the confederate moved on to the next player.

In the tit-for-tat treatment the confederate started by choosing co-operate (playing red) in round 1 and then from the next round on the confederate chose the color that the subject had chosen in the previous round. So the feedback the subject received in this treatment is dependent entirely on his choices, since if the subject chooses red (blue) in round t then the confederate responds with red (blue) in round t+1. For the random-play treatment, prior to starting the experiments, we chose a sequence of random numbers and

converted them to a strategy – red or blue - depending on whether the number was even or odd respectively.

The subjects played 10 practice rounds and then 20 rounds for money. They were unaware of the total number of money rounds beforehand.

At the conclusion of the Prisoner's Dilemma game the subjects were given the instructions to the second part of the experiment. Questions were answered and then the subjects were broken up into two equal sized groups. One group stayed in the same room while the other group was sent to an adjoining room. The subjects were paired anonymously. The Sender and the Receiver in each pair were always in different rooms and could not see one another and did not know who they were paired with. They were then handed the forms for recording their decisions. Decisions made by each Sender in one room were conveyed to the corresponding Receiver in the other room and vice versa. The record sheets were collected by the experimenter and taken from room to room.[3]

This concluded the experiment. The subjects were then paid in the order in which they had shown up. The average pay-off for the whole experiment, which lasted about an hour and a half, was approximately $20.00.

We ask two broad questions. (1) does the nature of the experience in the RPPD game affect Investment Game decision-making? (2) Do the strategies adopted by the subject in the RPPD game correlate with decisions made in the Investment Game?

---

[3] The original Berg et al experiment followed a double-blind procedure where even the experimenter was unaware of which subject made which decision. In our study while the subjects are paired anonymously, the experimenter does get to see the subjects' decisions. We did not institute a double-blind procedure since it is debatable whether a double-blind procedure is absolutely essential. Bolton, Katok and Zwick (1998) comment "We find no basis for the anonymity hypothesis…" referring to double-blind procedures. Roth (1995, pp. 301) comments "…there is no evidence to the effect that observation by the experimenter inhibits player 1 in ultimatum games, nor that it is the cause of extreme demands in dictator and impunity games."

3. Experimental Results

3a. Classification of Subjects

The first step was to classify the subjects into different categories according to how the behaved in the RPPD game. For subjects in the TFT condition, the maximizing strategy entailed choosing to cooperate during each round. This results in a pay-off of $0.50 every round for a whole game total of $10.00. This compares to a whole game payoff of $4.00 for a defect strategy. However, there is an intermediate strategy that entails perfectly alternating between cooperate and defect. This strategy was adopted by 12 out of 60 TFT treatment participants. The strategy results in a payoff of $0.45 every round (1/2*(0.80+0.10), for a whole game total of $9.00. While not as profitable as the maximizing strategy, the alternating strategy does quite well and can be referred to as "satisficing" behavior. (Simon, 1997).

We looked at the last 10 of the 20 money rounds to classify participants according to the strategy they adopted in the RPPD game. We assumed that this was enough time for the subjects to "learn" what the optimal strategy was. Subjects who played red (i.e. cooperated) in each and every round are designated TFT-Cooperators (n = 14), individuals who played a perfectly alternating sequence of Red and Blue are TFT-Satisficers (n = 12). We combine these two groups and collectively refer to them as the TFT-Maximizers.[4] Everybody else i.e. individuals who consistently or most frequently chose to defect in the last 10 rounds are TFT-Non-Maximizers (n = 34).

---

[4] We feel justified in doing this since they earn similar amounts in the RPPD game and in looking at the decisions made by these two groups in the subsequent investment game, we find no significant differences in the means of the choices made by the two groups. For instance in the Sender stage of the investment game, TFT-Cooperators keep $1.43 and send $3.57 while TFT-Satisficers keep $1.21 and send $3.79. This

In the RAN treatment pay-off is maximized by choosing defect in every round. Since the confederate randomizes between Red and Blue the subject can expect to make $0.50 in each round (1/2*(0.80+0.20)). Again we look at the last 10 rounds of the money rounds. A subject is a RAN-Maximizer (n = 20) if he/she played the optimal strategy (choosing blue or defect) in every one of those last 10 rounds. If a RAN subject chose to cooperate at least once or more during the last 10 rounds then that subject is labeled a RAN-Non-Maximizer (n = 10).

It is possible also to group individuals across both treatment groups in terms of their cooperativeness or lack thereof. Thus the TFT-Maximizers and the RAN-Non-Maximizers qualify as cooperative. These are subjects who either consistently or most frequently choose to cooperate. While RAN-Maximizers and TFT-Non-Maximizers qualify as defectors, choosing the defect option consistently or frequently.

3b. Analysis of Decisions in the Investment Game

The first question investigated concerned the impact of treatment group membership on investment game decision-making? Results reveal no differences in investment game decision-making between those individuals assigned to the TFT treatment condition as compared to those assigned to the RAN treatment condition (t = 0.68; p-value = 0.49). So whether subjects take part in the TFT treatment or the RAN treatment does not seem to act as a conditioning device. This result is consistent with those reported by Silverstein et al (1998). They reported no difference in the cooperative

---

difference is not significant. (t-stat = 0.357) The same is true of their behavior in the Receiver stage of the Investment Game. TFT-Cooperators, on average, keep 63% of the amount offered to them as Receivers, while TFT-Satisficers keep 61%. This difference is not significant. (t-stat = 0.215) Hence we feel justified in combining the two groups together into one as TFT-Maximizers.

behavior of subjects previously exposed to four different RPPD conditions, including TFT and RAN.

We did find significant group differences when we looked at the data at a disaggregated level. We made the following group comparisons: (1) TFT-Maximizers to TFT-Non-Maximizers and (2) TFT-Maximizers to RAN-Maximizers and (3) RAN-Maximizers to RAN-Non-Maximizers. In each case we made comparisons for zero-sum (i.e., the stage in which participants made the Receiver decision) and non-zero-sum behavior (i.e., the stage at which participants made the Sender decision).

3b.1. Comparing TFT-Maximizers and TFT-Non-Maximizers

Zero-sum behavior. Results revealed no differences between maximizers and non-maximizers regarding the percentage of money they keep for themselves and, conversely, the money they send to their partner. That is, non-maximizers kept 66% of the money they receive and sent back 34% to the anonymous Sender, while maximizers kept 62% and sent back 38%. t-tests show that these differences are not significant ($t = 0.467$; not significant). Interestingly, these results are consistent with those reported by Berg, Dickhaut and McCabe (1995). They found that in an experimental condition similar to ours receivers keep 70% and send 30%.

A question arises as to the potential confound of different amounts of money used by individuals in making zero-sum decisions. This is so because of variations due to each participant making decisions based only on the amount originally sent to them by their partner. However, a correlational analysis revealed an insignificant relationship between the amount kept (or sent back) by the Receiver and the amount of money initially received (Spearman's $r = 0.07$; this is only for the subjects in the TFT condition)

Non-zero-sum behavior. Turning to decisions made in the Sender stage we find a very different pattern of behavior across groups. Recall that at this stage subjects are faced with a trade-off between maximizing their own profit (individual welfare) and maximizing the total purse to be shared with their partner (the public welfare). In this stage each participant made a decision regarding how to split the initial endowment of $5.00. Maximizers kept, on average, $1.33 out of the $5.00 (i.e. 26%), and sent $3. 67 (74%). Non-maximizers, on the other hand, kept, on average, $2.03 (41%) and sent $2.97 (59%). Analyses reveal that this is a significant difference (t = 1.79; 2-tailed p-value = .07, 1-tailed p-value=0.03), indicating that individuals who maximized during the RPPD game were more "generous" with respect to making the sender decision. We also carried out non-parametric tests to compare the distribution of the amount kept as Senders across maximizers and non-maximizers. The null hypothesis is that the two distributions are identical while the alternative is that they are not. A Wilcoxon ranksum test returns a z-value of 1.895 with a corresponding p-value of 0.058, showing that the values are drawn from different distributions. Note, however, that such generosity may be the result of a reciprocation expectation (trust) rather than motivated by altruism. Table 2 provides a summary comparison of behavior in the non-zero-sum stage.

Table 2

	TFT Maximizers	TFT-Non-Maximizers
No. of subjects	**26**	**34**
Amount sent (Out of $5.00)	**$3.67**	**$2.97**
Amount Kept (Out of $5.00)	**$1.33**	**$2.03**
Percentage of Initial Endowment Sent	**74**	**59**
Percentage of Initial Endowment Kept	**26**	**41**

In addition to making comparisons across groups with respect to average amount kept or sent, we also examined group differences regarding extreme contributions to the public good (i.e., trusting behavior). This was done by comparing the groups in terms of the number of individuals who sent all of the initial $5.00 endowment. This behavior shows a total commitment to maximizing the purse, presumably with the assumption that such behavior would be rewarded by the anonymous partner in the Receiver round. Of the 26 maximizers, 13 (50%) gave away all of their $5.00, while among 34 non-maximizers, only 7 (20%) did so. A sample proportions test revealed a significant difference ($z = 2.46$; $p < 0.02$) between the groups illustrating that TFT maximizers were more likely to make a total commitment to the public good compared to non-maximizers.

3b.2. Comparing TFT Maximizers and RAN Maximizers

Next we compared the behavior of TFT-Maximizers and RAN-Maximizers in the zero-sum and non zero-sum situations. The rationale for this comparison is the following. While both of these groups of subjects engage in maximizing behavior, that behavior

requires very different responses. For TFT subjects maximization means consistent or at least frequent cooperation while for RAN subjects it means consistent defection.

Zero-sum behavior. Looking at the Receiver decisions, we find no significant differences between the groups. That is, TFT maximizers kept, on average, 62% and sent back 38%, while RAN maximizers kept, on average, 54% and sent back 46%. This difference is not significant. (t-stat = 0.72)

Non-zero-sum behavior. Once again, group differences emerged with respect to sender decisions. Out of the initial endowment of $5.00 TFT Maximizers kept only $1.33 (26%) and sent $3.67 (74%), while the RAN maximizers kept $2.12 (44%) and sent $2.88 (56%) (t = 1.71 ; 2-tailed p-value = .09, 1-tailed p-value = 0.04). This result, that the TFT maximizers send more out of the initial $5.00, is also corroborated by the non-parametric Wilcoxon ranksum test (z value of 1.679 with a corresponding p-value of 0.09).

Table 3 provides summary comparisons of behavior in the non-zero-sum game.

Table 3

	TFT Maximizers	**RAN Maximizers**
No. of subjects	**26**	**20**
Amount sent (Out of $5.00)	**$3.67**	**$2.88**
Amount Kept (Out of $5.00)	**$1.33**	**$2.12**
Percentage of Initial Endowment Sent	**74**	**56**
Percentage of Initial Endowment Kept	**26**	**44**

3b.3 Comparing RAN maximizers and RAN Non-maximizers

Finally we made similar comparisons between RAN maximizers and RAN non-maximizers.

Zero-sum behavior. Looking at the Receiver decisions, no significant differences were found. (t-stat = 1.12) On average RAN non-maximizers keep back 69% and return 31% to the Sender, while RAN maximizers keep 54% and return 46%.

Non-zero sum behavior. As with the TFT treatment we find significant differences in the behavior of maximizers and non-maximizers in the RAN treatment. RAN maximizers, on average are less generous than the non-maximizers. RAN maximizers keep back $2.12 (44%) out of the initial $5.00 and send $2.88 (56%) while non-maximizers keep back only $1.10 and send $3.90. (t-stat = 1.75, 2-tailed p-value = 0.09, 1-tailed p-value = 0.04)

There is a significant difference between the amounts sent by maximizers and non-maximizers. A Wilcoxon ranksum test returns a z value of 1.733 which is significant at the 0.08 level. Table 4 provides summary comparisons.

Table 4

	RAN Non-Maximizers	RAN Maximizers
No. of subjects	**20**	**10**
Amount sent (Out of $5.00)	**$3.90**	**$2.88**
Amount Kept (Out of $5.00)	**$1.10**	**$2.12**
Percentage of Initial Endowment Sent	**74**	**56**
Percentage of Initial Endowment Kept	**26**	**44**

However given that there are only 10 observations in the non-maximizer category the above results must be interpreted with caution.

3b.4. A different perspective on behavior in the Investment Game

There is one other way to organize the data. As we mentioned above TFT-Maximizers and the RAN-Non-Maximizers may be combined to form a group characterized by systematic use of cooperation in the RPPD game. There are 36 such subjects. The RAN-Maximizers and TFT-Non-Maximizers, on the other hand, did not utilize cooperation as an element of their RPPD game strategy. Rather, they hold in common, consistent or frequent defection. There are 54 subjects who either consistently or most frequently choose to defect. Therefore, it is important to investigate differences across groups adopting these different strategies.

Zero-sum behavior. No significant differences emerge across groups regarding decisions made in the Receiver stage of the Investment Game. t-stat = 0.68, 2-tailed p-value = 0.49.

Non-zero-sum behavior. However in the Sender stage of the Investment Game significant differences do occur. On average the cooperators kept $1.26 out of the initial endowment of $5.00 and sent $3.74 to the Receiver. The defectors on the other hand, kept $2.09 and sent $2.91. The difference between the amounts sent ($3.74 against $2.91) is significant (t = 2.49; 2-tailed p-value = 0.014). This result is also borne out by the non-parametric Wilcoxon ranksum test. (z-value = 2.532, p-value = 0.0113). This difference between cooperators and defectors is by far the strongest result that we obtain. Thus it seems that the cooperators display a significantly higher level of trust then the defectors do, as indicated by their willingness to contribute to the public good. We compare the

behavior of our subjects, in the non-zero sum stage, to those in the no-history treatment of Berg et al (1995) in Table 5 below.

Table 5

	Cooperators	Defectors	All subjects	Berg et al
No. of Subjects	**36**	**54**	**90**	**60**
Amount Sent	**$3.74 (Out of $5.00)**	**$2.91 (Out of $5.00)**	**$3.24 (Out of $5.00)**	**$5.16 (Out of $10.00)**
Amount Kept	**$1.26 (Out of $5.00)**	**$2.09 (Out of $5.00)**	**$1.76 (Out of $5.00)**	**$4.82 (Out of $10.00)**
Percentage of Initial Endowment Sent	**74.8**	**58.2**	**64**	**51.6**
Percentage of Initial Endowment Kept	**25.2**	**41.8**	**36**	**48.4**

Another interesting phenomenon is that out of 36 cooperators, 19 (53%) chose to give away the entire $5.00 at the Sender stage of the game. However, out of 54 defectors, only 13 (24%) did so. A sample proportions test for the equality of the two proportions illustrates a significant difference between these groups ($z = 2.95$; $p < 0.01$). This shows that the behavior of the two groups is significantly different and that the cooperators seem to exhibit a pattern of extreme commitment to the public good. Of course, this commitment may be based on a sense of trust that the anonymous partner who benefits from this behavior will reciprocate in some fashion.

3b.5. Discussion of the Results

The present experiment investigated the impact of prior experience in a RPPD game, and strategic tendencies towards cooperation versus defection, on two types of social behavior. Trusting behavior was measured by examining the amount of money an individual sent to an anonymous partner compared to how much they kept for

themselves. This was referred to as the Sender decision. Importantly, each subject was aware that the amount sent to an anonymous partner would be tripled and that the amount they kept for themselves would not be. Further, all subjects were aware that their anonymous partner, after having received that tripled sum, would have an opportunity to send all, some, or none of it back to them. In addition to making the Sender decision, each subject served as an anonymous partner to some other subject and made a Receiver decision. This decision involved determining the amount of the tripled sum to send back. The percentage of the tripled sum that was eventually sent back to the Sender constituted a measure of Reciprocal behavior.

The hypotheses of the present study concerned evaluating possible differences regarding the trust behavior and reciprocal behavior of the subjects. The primary questions concerned the potential impact on trust behavior and reciprocal behavior of: (1) RPPD game condition (TFT versus RAN), (2) RPPD game strategy (Cooperate versus Defect), and (3) RPPD game payoff (maximizer versus non-maximizer). We also predicted a significant positive relationship between trust behavior and reciprocal behavior.

RPPD game condition had no effect on subsequent social behavior during the investor game. That is, individuals assigned to the TFT or RAN conditions did not differ in terms of their trust behavior or in terms of their reciprocal behavior. This was expected because it was our belief that the factor determining trust behavior and reciprocal behavior is one's ability to conform with available social and economic contingencies. Assignment to groups did not constitute a measure of this variable.

Contrary to our expectations, RPPD game payoff was found to be unrelated to social behavior during the investor game. That is, individuals who maximized their returns in the RPPD game did not behave differently than those who failed to maximize their returns with regard to trust behavior or reciprocal behavior in the investor game. If we look at subject earnings in the RPPD game, then the median earning is $8.80. We decided to do a median split and see if the low-earners and high earners differed with respect to trusting and reciprocal behavior. We fail to find any significant difference in behavior. On average those who made less than $8.80, send $3.22 and keep $1.76 as the sender in the investment game. The corresponding numbers for those who are above the median is $3.23 and $1.77. As for reciprocal behavior the ones below the median keep back 34% of any amount offered to them while those above the median keep back 39% of any amount offered to them. The corresponding t-stat is -0.85 with a p-value of 0.39.

This suggests that orienting one's behavior so as to respond most effectively to social or economic contingencies is not a determinant of trust or reciprocity, as defined in the present experiment.

We find that RPPD game strategy is related to social behavior during the investment game. That is, with respect to trust behavior, subjects who chose a cooperate strategy sent more money to their anonymous partner in the Sender decision than did individuals who chose a defect strategy. This behavior is consistent with maximization to the degree that an individual trusts that they will be rewarded for having increased the amount available to their partner. There were no differences across groups with respect to reciprocal behavior.

It was our belief that trust behavior would be determined by successful orientation to available reinforcement contingencies, not by strategy irrespective of payoff. Therefore, we expected that although the cooperator group would include some individuals who would engage in high rates of trust (TFT Maximizers), it would also include individuals who would not (RAN Non-Maximizers). We expected the tendencies of these groups to cancel out.

To further clarify this issue, we compared the trusting behavior of cooperators versus non-cooperators within the TFT and RAN conditions, respectively. As mentioned above, we expected TFT Maximizers to have exhibited trust in the investment game, and for RAN Non-maximizers to not have exhibited trust. Such a finding would support the idea that trust is a function of maximizing payoffs within the context that supports cooperation. Results of the within groups analyses, however, did not support this notion. Rather, they revealed that greater trust behavior was exhibited by both TFT Maximizers and RAN Non-Maximizers. This result confirms that the strategy adopted--regardless of payoff obtained--was important with respect to subsequent trust behavior.

One last hypothesis was tested in this study--the relationship between trust and reciprocity. Contrary to our prediction, we found no correlation between the amount received and amount sent back. That is, it is not the case that subjects who received more money from their partner sent back more once they had an opportunity to "reward" that partner. If we look at the relation between the amount of money received by a receiver and the percent of money that the receiver sent back then we get a very small Spearman's Correlation Coefficient of –0.21. This is not significant but more importantly the sign is the opposite of what is expected. This suggests that as the money received by the

receivers increase, the receivers actually keep a larger part of it and return a smaller part of it.

This finding of a lack of reciprocity is borne out by previous studies. Abbink, Irlenbusch and Renner (2000) report that a large fraction of the receivers (the authors call them Player B) who receive money behave selfishly and keep the whole amount. The authors go on to say that they find strong evidence of "retribution" or negative reciprocity, where subjects punish a pair-member for perceived selfishness. The same subjects, however, are not as forthcoming in rewarding their pair-members for their generosity. Abbink et al (2000, pp 271) remark "reciprocation is thus much less homogeneous than retribution". Gneezy, Guth and Verboven (2000) also carry out the same investment game experiment introduced by Berg et al (1995). Their findings regarding reciprocal behavior is slightly ambiguous. In two of their treatments they find positive correlation between the amounts sent by the sender and those returned by the receiver but in a third treatment they find negative correlation. However Gneezy et al (2000) report greater reciprocity than in Abbink (2000) et al or in the present study.

To summarize, the present study allowed us to investigate both the effects of reinforcement and pre-existing tendencies toward cooperation or defection on subsequent social behavior. They illustrate that reciprocal behavior was unrelated to treatment condition, game strategy, or game payoff. Results did, however, illustrate differences across groups for trust behavior. That is, individuals who adopted a cooperative strategy in the RPPD game were more trusting in the subsequent investment game. This trusting tendency among this group was observed regardless of whether they had been highly rewarded for cooperation (TFT) or received minimal reward for cooperation (RAN).

4. Concluding Remarks

The present study is interesting for several reasons. First it reports on a strategy for connecting cooperative behavior and trusting behavior in the same subject. It has been argued that trust is crucial to the development of long term cooperative behavior (Pruitt and Kimmel, 1977).

In addition the study is also interesting with regard to what it suggests about the relationship between trust behavior and reciprocal behavior. First, these two behaviors were unrelated to each other. While this is surprising from the standpoint of our original predictions, a plausible post hoc explanation exists based on the fact that trust behavior, but not reciprocal behavior, was predicted by RPPD game behavior.

A primary difference regarding trust and reciprocity in the present experiment concerns the fact that trust can be formulated as consistent with maximizing one's own returns while reciprocity cannot. Let us look at it from the standpoint of a participant. From this perspective, one could reason that behaving in an extremely generous or an extremely non-generous way is consistent with maximizing one's return. That is, one could say to one's self, "to the extent that I send money to my partner I increase total possible payoff threefold (from a maximum possible of $5 to a maximum possible of $15). All that is necessary for me to get a greater return on money sent is for my partner to realize that I deserve to be rewarded for allowing him or her to make money. After all, I could have left them with nothing." On the other hand, reasoning in favor of non-generosity is also consistent with a maximization philosophy: "I have no idea what my partner will do. He or she may or may not recognize the benefit to themselves of me sending money. And even if they recognize it, maximizing on their part requires sending

me nothing in return." Therefore, the sender decision constitutes a homo economicus decision. That is, regardless of what is chosen, the decision can be justified with respect to increasing one's total payoff.

One other point needs to be appreciated here. Cooperation in a prisoner's dilemma game can be thought of as a self-control mechanism. On the one hand, defection increases the immediate rewards while lowering rewards in the future. Cooperation, on the other hand, does not maximize rewards in any particular trial but leads to larger rewards in the long-term. As Silverstein et al (1998) point out (pp. 125) "self-control is analogous to consistent cooperation while impulsiveness is analogous to momentary defection." In a prisoner's dilemma game, the subjects alternatives are identical to the alternatives provided in many studies of self-control – a smaller-sooner reinforcer (defection/impuslisiveness) versus a larger-later reinforcer (cooperation/self-control). See Rachlin (1995). One could think of a trusting decision along the same lines. On the one hand the subject has the option of taking the money up-front – the smaller-sooner reward. Or he can repose his trust in the receiver and take a small risk of sharing the money with the latter in the hope of getting the larger-later reward. Thought about in these terms, it is not surprising that the subjects who cooperate in the RPPD and exhibit greater self-control, also exhibit much higher levels of trust.

In the case of the reciprocal behavior decision, on the other hand, generous behavior cannot be justified from a self-interested or homo economicus point of view. That is, sending money back does in no way increases one's economic well being, or one's chance for subsequent economic well being. Therefore, such behavior is not economical or rational in nature. Rather such behavior falls in the category of being

altruistic, or what we have referred to as homo reciprocans. In this way, reciprocal behavior and trust behavior, as defined in the present experiment, are not of the same response class. That is, one can be thought of in terms of the homo economicus assumption, but the other one cannot.

The main insight arising from the present study is that cooperative behavior in social dilemmas is tied closely with trusting behavior but not necessarily with reciprocal behavior.

Bibliography:

Abbink, K., B. Irlenbusch and E.Renner, (2000), "The Moonlighting Game: An Experimental Study on Reciprocity and Retribution", *Journal of Economic Behavior and Organization*, 42, pp. 265-77

Baker, F. and H. Rachlin, (1999), "Probability of Reciprocation in Repeated Prisoner's Dilemma Games", Mimeo, Department of Psychology, State University of New York at Stony Brook

Berg, J., J. Dickhaut and K. McCabe, (1995), "Trust, Reciprocity and Social History", *Games and Economic Behavior*, 10, pp. 122-42.

Bolton,G., E. Katok and R. Zwick, (1998), "Dictator Game Giving: Rules of Fairness versus Acts of Kindness", *International Journal of Game Theory*, 27, pp. 269-99.

Bolton G. and A. Ockenfels, (2000), "ERC: A Theory of Equity, Reciprocity and Competition", *American Economic Review*, 90 (1), March 2000, pp. 166-93.

Brown, J. and H. Rachlin, (1999), "Self-control and Social Co-operation", Mimeo, Department of Psychology, State University of New York at Stony Brook

Cox, J. (2000), "Trust and Reciprocity: Implications of Game Triads and Social Contexts", Mimeo, University of Arizona.

Deutsch, M. (1973), "The Resolution of Conflict", New Haven, CT: Yale University Press.

Falk, A. and U. Fishbacher (1999), "A Theory of Reciprocity", Working Paper #6, Institute for Empirical Research in Economics, University of Zurich.

Fehr,E., G. Kirchsteiger and A. Riedl (1993) "Does Fairness Prevent Market Clearing? An Experimental Investigation", *Quarterly Journal of Economics*, 108, pp. 437-60.

Fehr, E., S. Gächter and G. Kirchsteiger (1996), "Reciprocal Fairness and Noncompensating Wage Differentials", *Journal of Institutional and Theoretical Economics*, 152, pp. 608-40.

Fehr, E, S.Gächter and G. Kirchsteiger (1997), "Reciprocity as a Contract Enforcement Device", *Econometrica*, 65, pp. 866-60.

Fehr, E., and S.Gächter, (2000), "Fairness and Retaliation: The Economics of Reciprocity", *Journal of Economic Perspectives*, 14(3), Summer 2000, pp. 159-81.

Fehr, E. and K. Schmidt, (1999), "A Theory of Fairness, Competition and Cooperation", *Quarterly Journal of Economics*, 114(3), pp. 817-868.

Fukuyama, F. (1995), "Trust: The Social Virtues and the Creation of Prosperity", The Free Press, New York, NY.

Glaeser E., D. Laibson, J. Scheinkman and C. Soutter, (2000), "Measuring Trust", *Quarterly Journal of Economics*, 115(3) August 2000, pp. 811-846.

Gneezy, U., W. Güth, and F.Verboven, (2000), Presents or Investment? An Experimental Analysis", *Journal of Economic Psychology*, 21, pp. 481-93.

La Porta R., F. Lopez-de-Silanez, A. Shleifer and R. Vishny (1997), "Trust in Large Organizations", *American Economic Review Papers and Proceedings*, 87(2), pp. 333-338.

Ledyard, O., (1995), "Public Goods: Some Experimental Results", Ch. 2 in John Kagel and Alvin Roth (eds) "Handbook of Experimental Economics" , Princeton University Press, Princeton, NJ.

McKelvey, R. and T. Palfrey, (1992), "An Experimental Study of the Centipede Game", *Econometrica*, 60, pp. 803-36.

Messick, D.M., H. Wilke, M.B. Brewer, R.M. Kramer, P.E. Zemke and L. Lui, (1983), "Individual Adaptations and Structural Change as Solutions to Social Dilemmas", *Journal of Personality and Social Psychology*, 44, pp. 294-309.

Parks, C.D. and L. G. Hulbert, (1995), "High and Low Trusters' Responses to Fear in a Payoff Matrix", *Journal of Conflict Resolution*, 39(4), pp. 134-51

Parks, C.D., R.F. Henager and S.D. Scamahorn, (1996), "Trust and Reactions to Messages of Intent in Social Dilemmas", *Journal of Conflict Resolution*, 40(1), pp. 718-30.

Pruitt, D.G. and M.J. Kimmel, (1977), "Twenty Years of Experimental Gaming: Critique, Synthesis, and Suggestions for the Future", *Annual Review of Psychology*, 28, pp. 363-92.

Rachlin, H., (1989), "Judgment, Decision and Choice: A Cognitive/Behavioral Synthesis", W.H. Freeman and Company, New York.

Rachlin, H., (1995), "Self-control: Beyond Commitment", *Behavioral and Brain Sciences*, v 18, 109-159.

Roth, A.E., (1995), "Bargaining Experiments", Ch. 4 in John Kagel and Alvin Roth (eds), "Handbook of Experimental Economics", Princeton University Press, Princeton, NJ.

Silverstein, A., D. Cross, J. Brown and H. Rachlin (1998), "Prior Experience and Patterning in a Prisoner's Dilemma Game", *Journal of Behavioral Decision Making*, v 11, pp. 123-38.

Simon, H., (1997), "Satisficing" in Simon, Herbert A. Models of bounded rationality. Volume 3. Empirically grounded economic reason. Cambridge and London: MIT Press, 1997, pp. 295-98.

Appendix

Subject ID # _____

Instructions

This is an experiment in economic decision making. The National Science Foundation and other funding agencies have provided funds to conduct this research. The instructions are simple. If you follow them closely and make good decisions you can make an appreciable sum of money. These earnings will be paid to you in cash at the end of the experiment. You should try and make as much money as possible. Payoffs in this experiment are denoted in dollars and cents.

The experiment consists of two parts.

Instructions for Part 1 of the experiment:

In this part of the experiment you are in a room with several other subjects. Each of you will be playing a game with an experimenter for a number of periods. Don't try to guess the number of periods. We will tell you when to stop. In each period the experimenter will make a decision and so will you. Based on those decisions you will make money in every round. The money you make depends only on the decision that the monitor makes and you make. Decisions made by other subjects in the room have no bearing on your rewards.

You have been given two cards. One has a RED sticker on it and the other a BLUE sticker. In each round the experimenter and you will simultaneously choose a color - RED or BLUE. You will do so by turning over one of the two cards on the table in front you thereby exposing the color. The experimenter will also pick one of the two colors in the same way. The experimenter will make her choice based on a pre-determined rule. The experimenter's choice of color may or may not depend on your previous choices. The rule according to which the experimenter is making her choice will be revealed to you at the end of the entire session.

Your payoff will be determined according to the table below. The payoffs in the table are denoted in cents.

		MY CHOICE	
	XXXXXXX	**RED**	**BLUE**
EXPERIMENTER'S CHOICE	**RED**	**50**	**80**
	BLUE	**10**	**20**

This means that if the experimenter chooses RED and you choose RED you get 50 cents. If the experimenter chooses RED and you choose BLUE then you get 80 cents. If the experimenter chooses BLUE and you choose RED you get 10 cents and finally if the experimenter chooses BLUE and you choose BLUE then you get 20 cents.

In each round the experimenter will approach your table. When she says "PLEASE, TURN OVER YOUR CARD NOW" – you and the experimenter will SIMULTANEOUSLY pick one of the two colors – RED or BLUE. You will do so by taking one of your two cards and turning it over on the table thereby exposing the color. Please try to ensure that the other subjects in the experiment CANNOT see what color you are choosing in a round. You cannot change your color once you have made a choice. Once both of you have chosen a color the round comes to an end. When the round ends please record your pay-off in the Record Sheet.

Please take a look at the Record Sheet on Page 4 now. Keep a running total of your earnings in the Balance Row. In period 1 your balance is zero. In period 2 your balance is your earnings in period 1. In period 3 your balance is the sum of your balance in period 2 plus your earnings in period 2 and so on. Each round after that will proceed in the same way with the two of you choosing a color.

Please do not communicate with the experimenter or any other subject in the room.

Are there any questions? Please get any questions clarified before we start. Questions will not be answered once we have started the experiment.

Before we start, to make sure that you understand how the payoff table works please answer the following questions by filling in the blanks now.

If the experimenter chooses RED and you choose BLUE then you earn: _____

If the experimenter chooses BLUE and you choose RED then you earn: _____

If the experimenter chooses BLUE and you choose BLUE then you earn: _____

If the experimenter chooses RED and you choose RED then you earn: _____

Before we start the actual experiment where you will play for money we will have 10 practice rounds. These practice rounds are meant to familiarize you with the game so that you can play the game better. These rounds do not count in so far as earning money is concerned. After the 10 practice rounds the experimenter will stop and inform you that the practice rounds have ended and announce the start of the actual experiment where in each round you will make money based on the decisions you make. Please use the Record Sheet on Page 4 for the practice rounds. The Record Sheet on Page 5 is for the actual money rounds. If you are ready then we will start the Practice Rounds now.

Instructions for Part 2:

For this part of the experiment you will be divided into two equal groups. One group will stay in this room while the other will go to the next room.

There are two rounds to this part. In the first round every player is a SENDER. To start with each of you (in both rooms) have $5. You will not be given this money physically at this point. All payments will be made at the end of the session. But $5 is added to your balance. You are free to take the entire $5 and leave along with any amount that you earned in Part 1 of the experiment. Or if you wish you can split the $5 with an anonymous RECEIVER that you are paired with. You will not know the identity of this player that you are paired with. The anonymous RECEIVER that you are paired with is someone in the other room.

Any amount of money that you offer to the anonymous RECEIVER, however, will be **tripled** by the experimenter and given to the RECEIVER. That player then can take the entire amount of money offered to him (on top of what he earned in the previous part) and leave. Or he can decide to send some back to you, the SENDER.

Please take a look at the RECORD SHEET on Page 6 now to understand how you will send and receive money. In Round 1 when you are the SENDER, when asked to do so, please fill out the TOP PART of the Record Sheet on Page 6 only. If you are not sure what to do please ask one of the monitors.

In the second round everyone is a RECEIVER. You will RECEIVE a split from an anonymous SENDER. You will be told how an anonymous SENDER offered to split $5. This person that you are paired with be in the other room and his identity will not be revealed. Now you have to decide if (1) you wish to take the entire sum sent to you or (2) whether to send anything back to the anonymous SENDER who proposed the split to you. When asked to do so, please fill out the BOTTOM PART of the Record Sheet on Page 6. When you RECEIVE the split please copy the relevant information from Boxes D-F on Page 6 onto Boxes G-I on Page 7 for record keeping purposes. This makes it easier for you to calculate your earnings for this part of the experiment.

NB: You will not be paired with the same person in both rounds. You will be paired with one person the first time around and then with a different person the second time around. To clarify ideas let us say that you are subject #1. Then you may be SENDING a split of $5 to subject #2 while RECEIVING a split from subject #5. None of you know who you are paired with at any point. Only the experimenter knows that information.

Please remain in your seat till we ask you to come up and get your money. Regardless of your decisions we will pay everyone according to ID number after everyone is done.
Are there any questions? Okay then we will start the second part now.

RECORD SHEET FOR PRACTICE ROUNDS

ID # _____

	MY CHOICE		
EXPERIMENTER'S CHOICE	**XXXXXXX**	**RED**	**BLUE**
	RED	**50**	**80**
	BLUE	**10**	**20**

Experimenter's Choice	My Choice	Earnings For Round
RED	**RED**	**50**
RED	**BLUE**	**80**
BLUE	**RED**	**10**
BLUE	**BLUE**	**20**

RECORD YOUR EARNINGS FOR THE PRACTICE ROUNDS BELOW

Round	1	2	3	4	5	6	7	8	9	10	11	12
Balance	**0**											
Experimenter's Choice												
My Choice												
Earnings For Round												

RECORD SHEET FOR PART 1

SUBJECT ID # _____

	MY CHOICE		
EXPERIMENTER'S CHOICE	**XXXXXXX**	**RED**	**BLUE**
	RED	**50**	**80**
	BLUE	**10**	**20**

Experimenter's Choice	My Choice	Earnings For Round
RED	**RED**	**50**
RED	**BLUE**	**80**
BLUE	**RED**	**10**
BLUE	**BLUE**	**20**

RECORD YOUR EARNINGS FROM THE ACTUAL EXPERIMENT BELOW:

Round	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Balance	**0**											
Experimenter's Choice												
My Choice												
Earnings For Round												

Round	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Balance												
Experimenter's Choice												
My Choice												
Earnings For Round												

RECORD SHEET FOR PART 2

SUBJECT ID # _____

ROUND #1: YOU ARE THE <u>SENDER</u> NOW. PLEASE FILL OUT THE TOP PART

A	**Starting Amount**	
B	**Amount you wish to KEEP**	
C	**Amount you wish to SEND (A – B)**	

<u>SENDER: You will get the bottom part back after the RECEIVER you are paired with has made his decision</u>

<u>SENDER DO NOT WRITE BELOW</u>

<u>RECEIVER – FILL IN THE BOXES BELOW WHEN ASKED TO DO SO</u>

RECEIVER: Please make a note of the amount you have been offered, the amount you wish to keep and the amount you wish to send back on the next page in Boxes G, H and I. This makes record keeping easier

D	**Amount you have been sent (3 times C)**	
E	**Amount you wish to KEEP**	
F	**Amount you wish to SEND BACK (D – E)**	

RECORD SHEET FOR PART 2

SUBJECT ID # _____

ROUND #2: YOU ARE THE RECEIVER NOW:

Copy the information in Boxes D, E and F about the offer made to you, how much you wish to keep and how much you wish to send back below for record keeping purposes

G	**Amount you have been sent (3 times C)**	
H	**Amount you wish to KEEP**	
I	**Amount you wish to SEND BACK (D – E)**	

THIS PART IS FOR THE EXPERIMENTER'S USE – DO NOT WRITE BELOW!

Amount kept as SENDER in Round 1 (Enter the amount from Box B on previous page)	
Amount sent back by receiver in Round 2 (Enter the amount from Box F on previous page)	
Amount kept as RECEIVER in Round 2 (Enter the amount from Box H above)	
TOTAL (Boxes B + F + H) FOR PART 2	
TOTAL FOR PART 1 (Copy the Balance from Page 5 here)	
TOTAL FOR WHOLE EXPERIMENT	