Social Distance and Reciprocity

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Abstract

Contrary to the predictions of non-cooperative game theory, trust and reciprocity are commonly reported in simple games. We conduct a one-shot investment game to examine how social distance affects behavior in two-person exchanges. Two aspects of social distance are examined: ex post revelation of complete information on the second player's choice set and ex post revelation of information regarding the second player's identity. The results indicate that reciprocity is not affected by knowledge of the choice set, but depends critically on the possible revelation of the decision maker's identity. That is, the possibility that the second player's identity (picture) is revealed to his/her counterpart has a profound effect on the degree of reciprocity extended.

Key Words: *identity, reciprocity, and trust*

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I. Introduction

Many game-theoretic models presume that individual behavior is dictated by self-regarding preferences and, in certain controlled settings, the self-regarding model can predict quite well (e.g., refer to Bolton and Ockenfels, 2000; Cox and Deck, 2005). At the same time, people are predisposed to act cooperatively. Berg, Dickhaut, and McCabe (1995) provide empirical support for the argument that reciprocity and trust are behavioral primitives. They investigate behavior in a one-shot investment game in which reciprocity is paramount, characterized as follows. Two players are anonymously paired and both are endowed with cash. The first player is allowed to send any portion of his/her endowment to the second player, with the amount sent being increased by a multiplier. The second player then has the option of returning any portion of the amount received. The sub-game perfect equilibrium is for the first player to send nothing. Experimental findings, however, are not consistent with this prediction: instead positive amounts are usually sent and returned.

The current study investigates the effect of social distance on reciprocity in the one-shot investment game. Charness and Gneezy (2003, 1) refer to social distance as "the emotional proximity induced by a situation." In terms of the investment game, social distance is reduced if information about the second player is revealed to the first player, even if the information is revealed ex post (i.e., after decisions have been made and the game has been completed). Simply put, the second player may worry about *what* the first player thinks (e.g., whether the first player thinks poorly of the second player). Experimental evidence suggests that such concerns can

influence behavior in controlled settings (e.g., Dana, Cain, and Dawes, 2004; Dana, Weber, and Kuang, 2004).[1]

We suggest that altering the information available to players affects the social distance between them. We investigate social distance in the investment game and focus on whether two aspects of information revelation are important: information on the second player's choice set and information concerning the second player's identity. To isolate the effects of uncertainty concerning actions and identity, we modify the standard game. First, we introduce uncertainty as to the money available to the second player. In the standard investment game, the second player's choices are known.[2] We manipulate whether the first player is informed (at the conclusion of the experiment) of the multiplier used to determine the money available to the second player. Second, we introduce the possibility that the second player's identity is revealed. We manipulate whether a die is rolled to determine if the second player's picture is sent to the first player at the conclusion of the experiment. These two aspects of the investment game reduce social distance, but in distinct ways. Information regarding the multiplier provides information about the second player's choice set (actions), whereas the potential picture provides personal information about the second player (identity). In either case, a second player may respond more generously because ex post revelation of information reduces social distance.

In the initial treatment the first player does not know the multiplier that is applied to the money sent to the second player. Rather the first player is informed that the multiplier is either three or six, each with an equal chance of occurrence. Roth and Malouf (1979) and Roth and

[1] In related research, Charness and Dufwenberg (2004) suggest that the second player's underlying concerns reflect guilt aversion. According to Charness and Dufwenberg (2004, 6), a person with guilt aversion is motivated by "beliefs about others' beliefs." In our experiment, shame (which is externally generated) may drive behavior rather than guilt (which is internally generated). Our design does not allow us to differentiate these sentiments.

[2] The first player is aware of the money available to the second player (i.e., the amount sent times the multiplier) and that any portion can be returned.

Murnighan (1982) find that the availability of information can have a strong effect on choices, even if the availability of information does not change the theoretical predictions. When subjects receive information about others' monetary payoffs, decisions move in the direction of equal expected payoffs. In our first treatment, we examine the extent to which each player's behavior is affected by the fact that the second player's decision is not transparent. We compare the decisions of both players to those of players in a second treatment in which the multiplier is revealed ex post to the first player. We find that this reduction of social distance has no impact on the behavior of participants in our experiment.

Next we introduce the possibility that the first player will receive a picture of the second player after all decisions are made. Burnham (2003) reports that anonymity has a significant effect on behavior in dictator games (see also Hoffman, McCabe, Shachat, and Smith, 1994; Hoffman, McCabe and Smith, 1996; 1999; Bohnet and Frey, 1999).[3] As in our experiment, photographs are used to reduce social distance.[4] We find that the first player's behavior is not affected by reducing social distance; however, the second player displays greater reciprocity when identification to his/her counterpart is possible.

The remainder of the paper is organized as follows. The research method, including the experimental design and procedures, are reviewed in the following section. Section III presents the results and Section IV summarizes our study and provides direction for future research.

[3] Bolton and Zwick (1995) and Bolton, Katok, and Zwick (1998) question whether anonymity explains behavior in dictator games. Note that their concern is with the experimenter's observation of subject behavior, rather than anonymity between subjects. As we discuss subsequently, subjects' decisions are anonymous in our experiment.
[4] The use of photographs, as opposed to allowing players to directly observe one another (e.g., Bohnet and Frey, 1999), eliminates non-verbal cues.

II. Research Method

Experimental Overview and Design

The experiment consists of a one-shot investment game, similar to that conducted by Berg, Dickhaut, and McCabe (1995). In the game, one half of the subjects are located in room A and the other half in room B. Subjects from each room are randomly paired and each subject is endowed with $10. Subjects in room A decide how much of the initial endowment to send to a paired counterpart in room B. The amount sent is increased by a multiplier. We vary the multiplier among subjects in room B: either three or six with each having an equal chance of occurrence. Subjects in room B use the multiplier to determine the amount of funds available and then decide how much to return to room A.

Our design includes three experimental treatments. In the BASE treatment, subjects in room A do not learn the multiplier of their paired counterpart. In the PAYOFF treatment, subjects in room A are informed of the multiplier, but not until the conclusion of the experiment. Lastly, in the IDENTITY treatment, subjects in room A do not learn the multiplier, but they may receive a picture of their paired counterpart at the conclusion of the experiment.

Subjects

Participants include undergraduate and graduate students, with the majority (68 percent) pursuing a program of study in business. A total of 244 students (or 122 pairs) participated, with the experimental sessions consisting of four to 16 students (2 to 8 pairs).[5] Students are recruited

[5] In addition, student monitors participate in the experimental sessions, assisting in conducting the sessions. The monitors are not included in the number of subjects reported in the text of the paper.

at two state universities in the same city.[6] Each session lasted about 45 minutes, and students earned on average $25.93 for their participation.

The BASE treatment includes 88 subjects, the PAYOFF treatment 90 subjects, and the IDENTITY treatment 66 subjects. The average age is 23.17 years, 23.94 years, and 24.80 years, for the three treatments, respectively, with a Kruskal-Wallis test indicating no significant difference between treatments ($\chi^2 = 2.62$, $p = 0.270$). The number of males/females is 53/35, 46/44, and 34/32 for the three treatments, respectively, with a chi-square test indicating no significant differences across the treatments ($\chi^2 = 1.82$, $p = 0.403$).[7]

Experimental Procedures

Subjects are randomly assigned to one of two rooms, with one half in each room. An experimenter distributes instructions and reads them aloud (reproduced in the Appendix). Though subjects are located in different rooms, the instructions are identical in the two rooms. Next, subjects draw envelopes from a bag.[8] The envelopes include a unique subject code number.[9] For subjects in room A, the envelopes also include a decision form, which is used to transmit information between the two rooms – the amount sent and returned. For subjects in room B, the envelopes include a computation form, which indicates the subject's multiplier and

[6] All students participating in a particular session are from the same university. Of the 244 students taking part, 152 are from one university and 92 are from another. The data are not suggestive of any difference in students' behavior between the two universities.

[7] We also partition subjects by whether they complete the experiment in room A or room B. For subjects in room A, the three treatments do not differ in terms of age ($\chi^2 = 2.18$, $p = 0.335$) or the number of males/females ($\chi^2 = 2.69$, $p = 0.260$). Likewise, for subjects in room B, we do not find significant differences between treatments for age ($\chi^2 = 0.60$, $p = 0.742$) or the number of males/females ($\chi^2 = 6.19$, $p = 0.186$).

[8] One of the envelopes is marked monitor. The monitor is not paired with another participant, but rather verifies that the instructions are followed. The monitor is paid the average earnings of all the other participants in the session.

[9] Code numbers are recorded on the outside of each envelope as well as on an index card included in the envelopes. Subjects retain the index cards throughout the experiment and the envelopes are passed along to different people. At the end of the experiment, each envelope is returned to the subject who originally drew the envelope. The index cards enable the monitor to return each envelope to the correct person.

is used to compute the amount of money available. Each multiplier is equally likely and over the course of the entire experiment (all sessions), one half of the computation forms available for draw indicate a multiplier of three and the other half six.

At the outset of the experiment, subjects in room A decide how much of the initial endowment to send to room B. They can send any amount from $0 to $10 in $1 increments. Subjects in room A complete the decision form and return it to the original envelope. The envelopes are collected, taken to room B, and randomly distributed. Subjects in room B multiply the amount received by either three or six based on their computation form.[10] Subjects in room B then decide how much to send back to room A. The amount sent back can range from $0 to three or six times the amount received. Subjects in room B complete the computation form and then record the amount returned to room A on the decision form.

In the BASE treatment, the computation and decision forms are put back in the original envelopes: that is, the computation forms are placed in the room B envelopes and the decision forms are placed in the room A envelopes. The envelopes are collected and taken to a recorder, who does not have any knowledge of the experiment. Using the two forms, the recorder determines subjects' payments and puts cash in the original envelopes. The recorder also puts the forms back in the original envelopes, which are subsequently returned to subjects in rooms A and B. As such, subjects in room A never see the computation form and, in turn, do not know the multiplier or the amount of funds available to subjects in room B.[11]

[10] We do not include the initial endowment given to subjects in room B in computing the total funds available, which is the convention followed in the standard investment game. Informal discussions indicate that subjects in room B view the initial endowment as theirs to keep and that the luck of the draw resulted in them being assigned to room B.

[11] If the amount returned is large relative to the amount sent, subjects in room A may be able to infer that the multiplier of their paired counterpart is six. Generally, though, subjects in room A will not be able to infer the multiplier.

The PAYOFF treatment differs from the BASE treatment as follows. Subjects in room B put the decision and computation forms in the *same* envelope – the one originally received from room A. The recorder does not change the placement of the two forms (i.e., the two forms are left in the envelopes returned to room A). In this case, subjects in room A can examine the computation form and, thus, learn the multiplier of their paired counterpart.

The IDENTITY treatment differs from the BASE treatment as follows. At the beginning of the session, the experimenter takes a picture of each subject in room B using an instant, Polaroid camera and places the pictures in front of each subject. After subjects in room B decide how much to return to room A – and after they put the computation and decision forms back in the original envelopes – a six-sided die is rolled.[12] If an odd number is rolled, the subject's picture is placed in the envelope returned to the paired counterpart in room A. If an even number is rolled, the subject's picture remains in the room. Accordingly, there is a 50 percent chance that a subject's picture will be sent from room B to room A, and all subjects are aware of this possibility.[13]

In all treatments, after the envelopes are returned to subjects in rooms A and B, a post-experiment questionnaire is administered. Subjects receive $5 for completing the questionnaire.[14] The questionnaire is used to collect demographic information and other information that may provide insight into subjects' decisions.[15] Upon completion of the questionnaire, subjects are free to leave.

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[12] The die is rolled for each subject in room B.

[13] If a subject's picture is sent to room A, only his/her paired counterpart sees the picture, which is not publicly displayed.

[14] The $5 is the minimum amount that a subject can earn for participating in the experiment. The experimental instructions indicate that all subjects will receive $5 for completing a questionnaire at the end of the session.

[15] We examine whether differences arise between subjects in the three treatments on religious beliefs (1=not religious at all and 11=very religious), political attitudes (1=very liberal and 11=very conservative), and economic

III. Results

First we provide descriptive data for each experimental treatment. We examine the amount sent by subjects in room A and the amount returned by subjects in room B. The amount sent represents the trust exhibited by subjects in room A. For the amount returned, we normalize by the amount available to subjects in room B (i.e., the multiplier times the amount received). The ratio represents the extent to which subjects in room B exhibit reciprocity. We test whether the reciprocity ratio differs between subjects with a multiplier of three and those with a multiplier of six.[16] Subsequently, we formally test for differences in trust and reciprocity between the three treatments.

BASE Treatment

Panels A and B of Figure 1 depict the distribution of trust and reciprocity displayed by subjects in rooms A and B, respectively. Descriptive statistics are reported in Table 1. For subjects in room A, the majority (33 of 44 subjects) sends at least one-half of the initial endowment to room B. The mean and median are in excess of $6 and the mode is $10 (the entire endowment). Hence, subjects in room A are willing to send a considerable portion of their initial endowment to room B.

For subjects in room B, the reciprocity ratio is less than 50 percent most of the time (35 of 40 instances), which indicates that subjects in room B keep *more* than they return. The reciprocity ratio is greater than 50 percent only once. As a rule of thumb, subjects in room B

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situation (1=poor and 11=wealthy). We perform Kruskal-Wallis tests and in no case are differences significant at conventional levels. We repeat the analysis separately for subjects who complete the experiment in room A and in room B and find that inferences are unaffected.

[16] We also examine the raw (non-normalized) amount returned. Inferences are not affected, except where noted.

rarely return more than they keep. Panel B of Table 1 indicates that the median (and mode) reciprocity ratio is 0.33 for subjects with a multiplier of three and 0.17 for subjects with a multiplier of six. A Wilcoxon-Mann-Whitney test indicates that the ratio does not differ between subjects with multipliers of three and six at the 5 percent level ($z = -1.76$, $p = 0.083$).[17]

Next, we examine the ratio of the amount returned normalized by the amount sent, referred to as the return on trust. We find that the return on trust is 1.00 or less 26 of 40 times. The amount returned to subjects in room A very often is no more than the amount sent. Coupled with the previous findings (i.e., using the reciprocity ratio), the data suggest that subjects in room B keep more than their fair share of the surplus created due to amounts being sent from room A.

PAYOFF Treatment

The distribution of trust and reciprocity is depicted in Panels A and B, respectively, of Figure 2 and descriptive statistics are shown in Table 2. For subjects in room A, the amount sent is similar to that in the BASE treatment. Thirty-one of 45 subjects send at least one-half of the initial endowment. The mean and median are \$6 and the mode is \$10. As before, subjects in room A are willing to send a substantial portion of their initial endowment to room B.

For subjects in room B, the reciprocity ratio is less than 50 percent a majority of the time (33 of 42 times) and it is more than 50 percent only four times. Once again, subjects in room B seldom return more than they keep. The mean and median are not more than 0.33, partitioning subjects by the multiplier of three or six. Strikingly, the mode is zero. For subjects with a multiplier of three, seven of 22 return nothing. For those with a multiplier of six, the numbers

[17] Throughout the paper, inferences are unaffected regardless of whether we perform a Wilcoxon-Mann-Whitney test or a Kolmogorov-Smirnov test. In fact, parametric t-tests also result in similar inferences.

are similar: seven of 20 return nothing. A Wilcoxon-Mann-Whitney test indicates that the reciprocity ratio is unaffected by the multiplier at any conventional level ($z = -0.81$, $p = 0.416$). Looking at return on trust, we find that it is 1.00 or less 24 of 42 times. All in all, the findings for the PAYOFF treatment appear similar to the findings for the BASE treatment. Although ex post revelation of information about the multiplier reduces social distance by providing detail on the second player's choice set (actions), the second player's behavior is not responsive. Our results suggest that revelation of the multiplier induces little guilt or shame in second players.

IDENTITY Treatment

Panels A and B of Figure 3 depict the distribution of trust and reciprocity for subjects in rooms A and B, respectively. Descriptive statistics are presented in Table 3. For subjects in room A, the data are very similar to those presented earlier. Twenty-four of 33 send at least one-half of the initial endowment to room B. The mean and median are \$6.48 and \$6.00, respectively, and the mode is \$10. Again, subjects in room A send a sizable portion of the initial endowment to room B.

For subjects in room B, the reciprocity ratios appear to be greater than the ratios in the other two treatments. The mean and median ratios are 0.50 or near this value for most groupings (i.e., partitioning subjects by the multiplier or combining them). Moreover, the mode is at least 0.50 for each grouping. A Wilcoxon-Mann-Whitney test indicates that the multiplier does not affect subjects' reciprocity ratio at any conventional level ($z = -0.84$, $p = 0.423$).[18] These data suggest that subjects in room B often split the amount available to them evenly or nearly evenly.

[18] Looking at the raw amount returned, we find that subjects with a multiplier of six return more than those with a multiplier of three ($z = -2.03$, $p = 0.043$). This finding is consistent with greater reciprocity arising in the IDENTITY treatment. As reciprocity increases, subjects with a multiplier of six return more because they have more available.

The possibility of having a picture sent to the paired counterpart appears to result in more reciprocity by subjects in room B. We also examine return on trust and find that it is 1.00 or more 30 of 33 times. Indeed, return on trust exceeds 1.00 25 of 33 times. Subjects in room A benefit by introducing the possibility that the identity (picture) of the paired subject in room B will be revealed. In this treatment, the chance that a picture is sent reduces social distance because personal information about the second player may be provided. Our results are consistent with the argument that second players who are averse to feelings of guilt or shame resulting from the revelation of identity respond more generously.

Comparisons across Treatments

To formally test for differences between the three experimental treatments, we perform Kruskal-Wallis tests. To assess differences in trust, we use the amount sent by subjects in room A as the dependent measure. To assess differences in reciprocity, we use the reciprocity ratio and the return on trust as the dependent measures. For the reciprocity ratio, we perform the tests collapsing subjects with different multipliers into one group and for each multiplier group separately. The results are summarized below.[19]

For the amount sent by subjects in room A, we do not find any significant difference between the three treatments ($\chi^2 = 0.57$, p = 0754). For the reciprocity ratio, the results indicate that the experimental treatment affects the decisions of subjects in room B at $p < 0.001$ ($\chi^2 = 18.16$). Using the Steel-Dwass-Critchlow-Fligner procedure for distribution-free multiple comparisons, we find that the reciprocity ratio for the IDENTITY treatment differs from that of

[19] We also investigate whether behavior is affected by the number of subjects who take part in a session. Extensive analysis does not provide any evidence that our findings are affected by the number of subjects per session.

the other two treatments at $p < 0.001$ (refer to Hollander and Wolfe, 1999, 240-248). Subjects in room B reciprocate to a greater extent in the IDENTITY treatment than in the BASE or PAYOFF treatments. We repeat the analysis for subjects with a multiplier of three and for those with a multiplier of six and find that inferences are unaffected. Lastly, for return on trust, we find that differences arise among the three treatments, as may be expected ($\chi^2 = 16.88$, $p < 0.001$). Using the Steel-Dwass-Critchlow-Fligner procedure, we document that the IDENTITY treatment differs from the other two treatments at $p < 0.005$. Return on trust is greater when subjects in room B may have to send a picture of themselves to their paired counterpart in room A.

IV. Summary and Conclusions

The paper reports a series of one-shot investment games designed to examine the effect of social distance on trust and reciprocity. We vary two aspects of social distance across experimental treatments: whether the second player's choice set is disclosed to the first player and whether the second player's picture is potentially sent to the first player, with both aspects being revealed at the end of the experiment (i.e., after all decisions have been made). The ex post information about the second player (i.e., revelation of the multiplier to determine payoffs or potential revelation of identity) reduce social distance. In both cases, a second player who is averse to feelings of guilt or shame may respond more generously as social distance is reduced.

We find the following. The first player sends a considerable portion of his/her initial endowment to the second player, with the amount sent being invariant to the experimental treatment. The second player often returns a positive amount, but the magnitude is affected by social distance. In the BASE and PAYOFF treatments, the second player typically returns no

more than the amount received from the first player. In other words, any surplus arising from the amount sent to the second player is generally kept by the second player. In the IDENTITY treatment, on the other hand, the second player displays greater reciprocity and normally returns more than was received. Importantly, the second player's behavior is not affected by the ex post revelation of the player's choice set, but it is affected by potential ex post revelation of the player's identity.

Others have shown that revealing players' identity *before* decisions are made affects behavior (e.g., Bohnet and Frey, 1999; Burnham, 2003). Our study demonstrates that such effects arise even when identity is revealed *after* decisions are made. Further, we demonstrate that the effect arises when there is merely a possibility that the second player's identity will be revealed. We encourage future researchers to investigate other factors that may generate guilt aversion or shame and encourage reciprocity – especially in a one-shot investment game. Charness and Gneezy (2003) suggest that knowledge of a paired counterpart's surname can affect behavior. Knowledge of other personal features (e.g., sex, age, nationality, and race) also may influence behavior. Factors that cause players to identify with one another clearly may be important in explaining pro-social behavior (e.g., Jenni and Loewenstein, 1997). In addition, non-verbal cues, such as facial expressions or physical attractiveness may impact behavior (e.g., Scharlemann, Eckel, Kacelnik, and Wilson, 2001; Andreoni and Petrie, 2004). Finally, another intriguing aspect is whether the physical location of two players affects behavior. Charness, Haruvy, and Sonsino (2003) manipulate whether subjects are located in the same room versus in different countries (participating via the Internet). Their findings suggest that physical location may not matter as long as subjects are paired with another completing the experiment at the *same*

time (i.e., contemporaneous participation). Further research is needed to clarify factors that affect behavior (trust and reciprocity) and to understand *how* such factors impact behavior.

Appendix

1. Instructions for the BASE Treatment

General Instructions

You have been asked to participate in a decision-making experiment. In the experiment, you will be paired with another participant located in another room. You will not be told the identity of the other participant at any time during or after the experiment. It is very important that you not talk or communicate with others throughout the experiment.

One half of the participants are completing the experiment in Room A and the other half in Room B. Each participant in Room A will be randomly paired with someone in Room B. Each participant in Room A and Room B is given $10. Participants in Room A have the opportunity to send any portion of their $10 to a randomly assigned participant in Room B. Participants in Room A can send any dollar amount – $0, $1, $2, $3, $4, $5, $6, $7, $8, $9, or $10.

Each dollar sent to Room B is increased either *three* times or *six* times. Only participants in Room B know whether the amount received is increased three or six times. The likelihood that the amount increases three times is 50 percent and the likelihood that it increases six times is 50 percent. Over the entirety of the experiment (i.e., over many sessions), the amount sent is multiplied by three one-half of the time and by six the other half. Participants in Room B decide how much money to send back to Room A and how much money to keep. Participants in Room B can send back any dollar amount – ranging from $0 to three- or six-times the amount received from Room A.

The remainder of the instructions explains exactly how the experiment is conducted. The experiment is structured so that no one, including the experimenters, will know the personal decisions of participants in Room A or Room B.

Specific Instructions

Participants in each room will draw envelopes from a bag. The envelopes will include a code number, which you must keep with you. One of the envelopes will be marked 'Monitor.' The Monitor will not be paired with another participant, but rather will verify that the instructions are followed and assist in conducting the experiment. The Monitor's envelope will indicate how s/he is paid at the conclusion of the experiment.

In addition to a code number, the envelopes include different information for participants in Room A and Room B. For those in Room A, the envelope contains a decision form, which includes the participant's code number. The decision form requires participants in Room A to indicate the amount to send to a randomly paired participant in Room B – this can be any dollar amount from $0 to $10. For participants in Room B, the envelopes include a computation form, which includes the participant's code number, and states whether the amount received increases three times or six times. Remember, there is a 50 percent chance that the amount received increases three times and a 50 percent chance that it increases six times.

Participants in Room A complete the decision form and return it to the original envelope. The monitor collects the envelopes, which are then randomly distributed to participants in Room B. Participants in Room B multiply the amount received by either three or six. Next, participants in Room B determine how much to send back to the randomly-paired participant in Room A – the amount sent back can range from $0 to three or six times the amount received.

As mentioned earlier, participants in both rooms receive a form. Each form must be completely filled out. The decision form received by participants in Room A is shown below. The first line is filled in. Participants in Room A fill in the second line. Participants in Room B fill in the third and fourth lines.

Decision Form – Room A	
(1) Code Number - Room A:	_____
(2) Amount Sent to Room B:	_____
(3) Code Number - Room B:	_____
(4) Amount Returned to Room A:	_____

The computation form received by participants in Room B is shown below. The form is used to determine the amount of money available to participants in Room B. The first line is filled in. The second line also is filled in and indicates whether the amount received increases three times or six times. Participants in Room B fill in the third, fourth, and fifth lines.

Computation Form – Room B	
(1) Code Number - Room B:	_____
(2) Increase in Amount Received:	_____
(3) Amount Received:	_____
(4) Amount Available [(2) x (3)]:	_____
(5) Amount Kept:	_____

Ultimately, the decision form is returned to participants in Room A and is used to determine their payoffs. The computation form is only used to determine payoffs for participants in Room B. The form is returned to participants in Room B and is never seen by participants in Room A.

Upon completion in Room B, the forms are returned to the original envelopes, collected, and taken to a Recorder. The Recorder, who does not have any knowledge of the participants or the purpose of the experiment, makes a record of participants' decisions and calculates the payoffs. Payments for participation are placed in an envelope and returned to participants by the Monitor. The payments are calculated as follows.

Room A = $10 – amount sent + amount returned
Room B = $10 + (multiplier * amount received) – amount returned

Participants in Room A each receive an envelope that contains their payment along with the returned decision form – now completely filled out. Participants in Room B each receive an envelope that contains their payment along with their computation form.

In addition to the procedures described above, all participants are paid $5 for completing a post-experiment questionnaire. The amount you receive in the envelope includes the $5 for the questionnaire.

Summary of Procedures

1. Participants in each room randomly draw an envelope.
2. In Room A, the envelopes contain a code number and a decision form.
3. In Room B, the envelopes contain a code number and a computation form. The computation form indicates whether the amount received increases three times or six times.
4. Participants in Room A determine how much of their $10 to send to participants in Room B.
5. Participants in Room B multiply the amount received by either three or six to determine the amount of money available to them.
6. Participants in Room B determine how much to return to participants in Room A.
7. The forms are taken to a recorder who determines payoffs for participants in Room A and Room B.
8. The decision form is returned to participants in Room A and the computation form is returned to participants in Room B. Participants in both rooms receive payment for participation.
9. A post-experiment questionnaire is administered.

2. Instructions for the PAYOFF Treatment

General Instructions

You have been asked to participate in a decision-making experiment. In the experiment, you will be paired with another participant located in another room. You will not be told the identity of the other participant at any time during or after the experiment. It is very important that you not talk or communicate with others throughout the experiment.

One half of the participants are completing the experiment in Room A and the other half in Room B. Each participant in Room A will be randomly paired with someone in Room B. Each participant in Room A and Room B is given $10. Participants in Room A have the opportunity to send any portion of their $10 to a randomly assigned participant in Room B. Participants in Room A can send any dollar amount – $0, $1, $2, $3, $4, $5, $6, $7, $8, $9, or $10.

Each dollar sent to Room B is increased either *three* times or *six* times. Participants in Room B know whether the amount received is increased three or six times. The likelihood that the amount increases three times is 50 percent and the likelihood that it increases six times is 50 percent. Over the entirety of the experiment (i.e., over many sessions), the amount sent is multiplied by three one-half of the time and by six the other half. Participants in Room B decide how much money to send back to Room A and how much money to keep. Participants in Room B can send back any dollar amount – ranging from $0 to three- or six-times the amount received from Room A. After participants in Room B make their decisions, participants in Room A learn whether the amount that they originally sent to Room B was increased three or six times.

The remainder of the instructions explains exactly how the experiment is conducted. The experiment is structured so that no one, including the experimenters, will know the personal decisions of participants in Room A or Room B.

Specific Instructions

Participants in each room will draw envelopes from a bag. The envelopes will include a code number, which you must keep with you. One of the envelopes will be marked 'Monitor.' The Monitor will not be paired with another participant, but rather will verify that the instructions are followed and assist in conducting the experiment. The Monitor's envelope will indicate how s/he is paid at the conclusion of the experiment.

In addition to a code number, the envelopes include different information for participants in Room A and Room B. For those in Room A, the envelope contains a decision form, which includes the participant's code number. The decision form requires participants in Room A to indicate the amount to send to a randomly paired participant in Room B – this can be any dollar amount from $0 to $10. For participants in Room B, the envelopes include a computation form, which includes the participant's code number, and states whether the amount received increases three times or six times. Remember, there is a 50 percent chance that the amount received increases three times and a 50 percent chance that it increases six times.

Participants in Room A complete the decision form and return it to the original envelope. The monitor collects the envelopes, which are then randomly distributed to participants in Room B. Participants in Room B multiply the amount received by either three or six. Next, participants in Room B determine how much to send back to the randomly-paired participant in Room A – the amount sent back can range from $0 to three or six times the amount received.

As mentioned earlier, participants in both rooms receive a form. Each form must be completely filled out. The decision form received by participants in Room A is shown below. The first line is filled in. Participants in Room A fill in the second line. Participants in Room B fill in the third and fourth lines.

Decision Form – Room A
(1) Code Number - Room A: _____
(2) Amount Sent to Room B: _____
(3) Code Number - Room B: _____
(4) Amount Returned to Room A: _____

The computation form received by participants in Room B is shown below. The form is used to determine the amount of money available to participants in Room B. The first line is filled in. The second line also is filled in and indicates whether the amount received increases three times or six times. Participants in Room B fill in the third, fourth, and fifth lines.

Computation Form – Room B	
(1) Code Number - Room B:	_____
(2) Increase in Amount Received:	_____
(3) Amount Received:	_____
(4) Amount Available [(2) x (3)]:	_____
(5) Amount Kept:	_____

Ultimately, the decision form and the computation form are returned to participants in Room A. The two forms are used to determine payoffs for participants in the two rooms.

Upon completion in Room B, the forms are returned to the envelope received from Room A, collected, and taken to a Recorder. The Recorder, who does not have any knowledge of the participants or the purpose of the experiment, makes a record of participants' decisions and calculates the payoffs. Payments for participation are placed in an envelope and returned to participants by the Monitor. The payments are calculated as follows.

Room A = \$10 – amount sent + amount returned
Room B = \$10 + (multiplier * amount received) – amount returned

Participants in Room A each receive an envelope that contains their payment along with two forms: the returned decision form and the computation form, indicating the amount of money available to participants in Room B. Participants in Room B each receive an envelope that contains their payment.

In addition to the procedures described above, all participants are paid \$5 for completing a post-experiment questionnaire. The amount you receive in the envelope includes the \$5 for the questionnaire.

Summary of Procedures

1. Participants in each room randomly draw an envelope.
2. In Room A, the envelopes contain a code number and a decision form.
3. In Room B, the envelopes contain a code number and a computation form. The computation form indicates whether the amount received increases three times or six times.
4. Participants in Room A determine how much of their \$10 to send to participants in Room B.
5. Participants in Room B multiply the amount received by either three or six to determine the amount of money available to them.
6. Participants in Room B determine how much to return to participants in Room A.
7. The forms are taken to a recorder who determines payoffs for participants in Room A and Room B.
8. The decision form and computation form are returned to participants in Room A. Participants in both rooms receive payment for participation.
9. A post-experiment questionnaire is administered.

3. Instructions for the IDENTITY Treatment

General Instructions

You have been asked to participate in a decision-making experiment. In the experiment, you will be paired with another participant located in another room. It is very important that you not talk or communicate with others throughout the experiment.

One half of the participants are completing the experiment in Room A and the other half in Room B. Each participant in Room A will be randomly paired with someone in Room B. Each participant in Room A and Room B is given $10. Participants in Room A have the opportunity to send any portion of their $10 to a randomly assigned participant in Room B. Participants in Room A can send any dollar amount – $0, $1, $2, $3, $4, $5, $6, $7, $8, $9, or $10.

Each dollar sent to Room B is increased either *three* times or *six* times. Only participants in Room B know whether the amount received is increased three or six times. The likelihood that the amount increases three times is 50 percent and the likelihood that it increases six times is 50 percent. Over the entirety of the experiment (i.e., over many sessions), the amount sent is multiplied by three one-half of the time and by six the other half. Participants in Room B decide how much money to send back to Room A and how much money to keep. Participants in Room B can send back any dollar amount – ranging from $0 to three- or six-times the amount received from Room A.

After participants in Room B decide how much money to send back to participants in Room A, a six-sided die will be rolled to determine whether participants in Room B send a picture of themselves to participants in Room A. The die will be rolled for each participant. If the die roll is odd (1, 3, or 5), the participant's picture is sent to Room A. If the die roll is even (2, 4, or 6), the participant's picture is not sent.

The remainder of the instructions explains exactly how the experiment is conducted. The experiment is structured so that the experimenters will not know the personal decisions of participants in Room A or Room B.

Specific Instructions

After the instructions have been read aloud, the experimenter will take a picture of each participant in Room B using a Polaroid camera. A picture will be placed in front of each participant in Room B.

Participants in each room will draw envelopes from a bag. The envelopes will include a code number, which you must keep with you. Participants in Room B will record their code number plainly on the border of their picture.

One of the envelopes in the bag will be marked 'Monitor.' The Monitor will not be paired with another participant, but rather will verify that the instructions are followed and assist in conducting the experiment. The Monitor's envelope will indicate how s/he is paid at the conclusion of the experiment.

In addition to a code number, the envelopes include different information for participants in Room A and Room B. For those in Room A, the envelope contains a decision form, which includes the participant's code number. The decision form requires participants in Room A to indicate the amount to send to a randomly paired participant in Room B – this can be any dollar amount from $0 to $10. For participants in Room B, the envelopes include a computation form, which includes the participant's code number, and states whether the amount received increases three times or six times. Remember, there is a 50 percent chance that the amount received increases three times and a 50 percent chance that it increases six times.

Participants in Room A complete the decision form and return it to the original envelope. The monitor collects the envelopes, which are then randomly distributed to participants in Room B. Participants in Room B multiply the amount received by either three or six. Next, participants in Room B determine how much to send back to the randomly-paired participant in Room A – the amount sent back can range from $0 to three or six times the amount received.

As mentioned earlier, participants in both rooms receive a form. Each form must be completely filled out. The decision form received by participants in Room A is shown below. The first line is filled in. Participants in Room A fill in the second line. Participants in Room B fill in the third and fourth lines.

Decision Form – Room A	
(1) Code Number - Room A:	_____
(2) Amount Sent to Room B:	_____
(3) Code Number - Room B:	_____
(4) Amount Returned to Room A:	_____

The computation form received by participants in Room B is shown below. The form is used to determine the amount of money available to participants in Room B. The first line is filled in. The second line also is filled in and indicates whether the amount received increases three times or six times. Participants in Room B fill in the third, fourth, and fifth lines.

Computation Form – Room B	
(1) Code Number - Room B:	_____
(2) Increase in Amount Received:	_____
(3) Amount Received:	_____
(4) Amount Available [(2) x (3)]:	_____
(5) Amount Kept:	_____

Ultimately, the decision form is returned to participants in Room A and is used to determine their payoffs. The computation form is only used to determine payoffs for participants in Room B. The form is returned to participants in Room B and is never seen by participants in Room A.

Upon completion in Room B, the forms are returned to the original envelopes. Then the experimenter will roll a six-sided die, numbered 1-6, to determine whether a participant's picture is sent to Room A. The experimenter will roll the die for each participant in Room B. If an odd number is rolled (1, 3, or 5) the participant's picture will be placed in the envelope returned to

Room A. If an even number is rolled (2, 4, or 6) the picture will remain in front of the participant in Room B.

After the die has been rolled for everyone, enveloped will be collected and taken to a Recorder. The Recorder, who does not have any knowledge of the participants or the purpose of the experiment, makes a record of participants' decisions and calculates the payoffs. Payments for participation are placed in an envelope and returned to participants by the Monitor. The payments are calculated as follows.

Room A = \$10 – amount sent + amount returned
Room B = \$10 + (multiplier $*$ amount received) – amount returned

Participants in Room A each receive an envelope that contains their payment along with the returned decision form – now completely filled out – and possibly a picture of the participant with who they were paired. Participants in Room B each receive an envelope that contains their payment along with their computation form.

In addition to the procedures described above, all participants are paid \$5 for completing a post-experiment questionnaire. The amount you receive in the envelope includes the \$5 for the questionnaire.

Summary of Procedures

1. Participants in Room B have their picture taken and placed in front of them.
2. Participants in each room randomly draw an envelope.
3. In Room A, the envelopes contain a code number and a decision form.
4. In Room B, the envelopes contain a code number and a computation form. The computation form indicates whether the amount received increases three times or six times.
5. Participants in Room A determine how much of their \$10 to send to participants in Room B.
6. Participants in Room B multiply the amount received by either three or six to determine the amount of money available to them.
7. Participants in Room B determine how much to return to participants in Room A.
8. A six-sided die is rolled for each participant in Room B to determine whether their picture is sent to Room A. An odd roll means that the participant's picture is sent, whereas an even roll means that the participant's picture stays in front of them.
9. The forms are taken to a recorder who determines payoffs for participants in Room A and Room B.
10. The decision form is returned to participants in Room A and possibly a picture of the participant with whom they were paired. The computation form is returned to participants in Room B. Participants in both rooms receive payment for participation.
11. A post-experiment questionnaire is administered.

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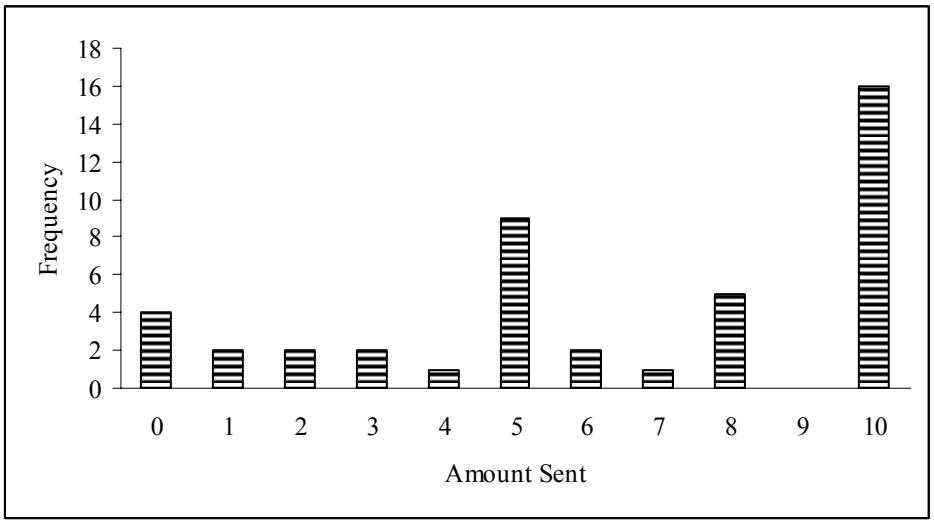
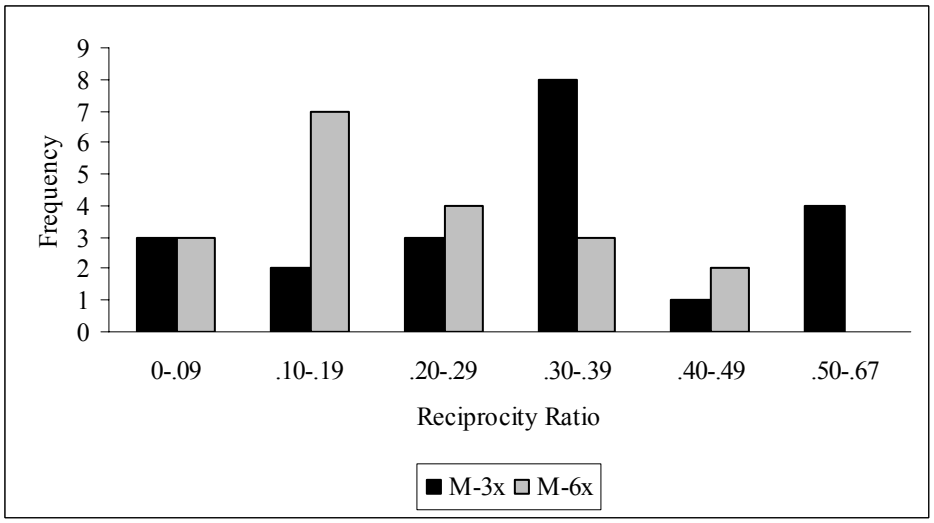
Figure 1: Trust and Reciprocity for BASE Treatment

Panel A: Distribution of Amount Sent from Room A

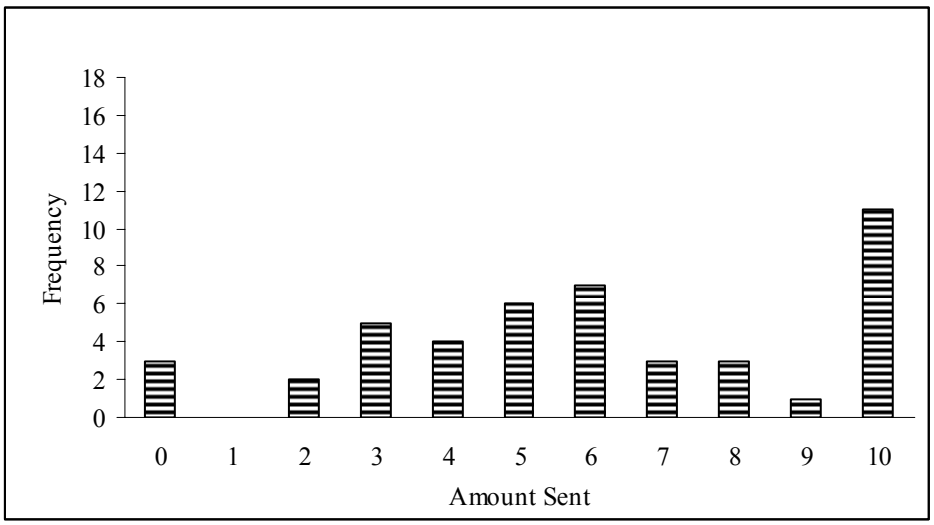


Panel B: Distribution of Reciprocity Ratio[a]

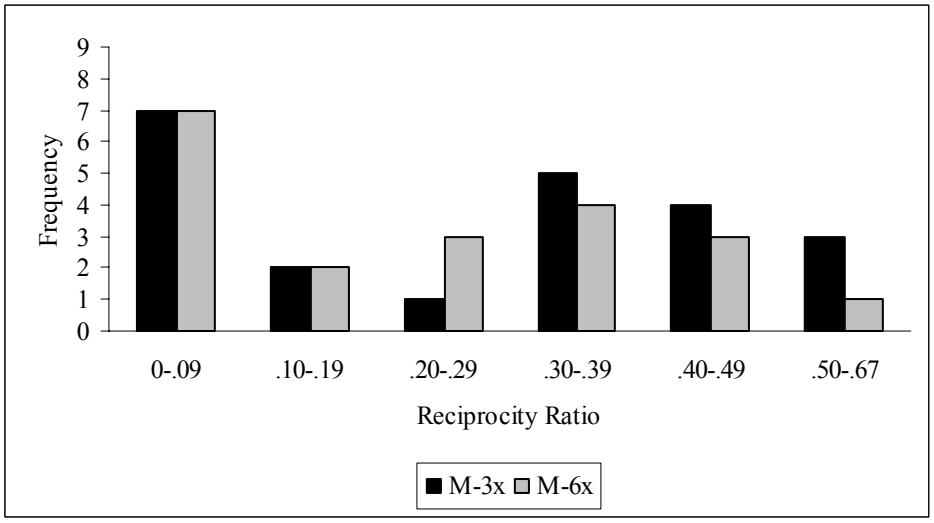


[a] The amount sent from room A to room B is increased by a multiplier of three or six (M-3x or M-6x), where the increased amount represents the total available in room B. Subjects in room B know the multiplier ex ante (at the beginning of the game), whereas those in room A never learn the multiplier. The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.

Figure 2: Trust and Reciprocity for PAYOFF Treatment



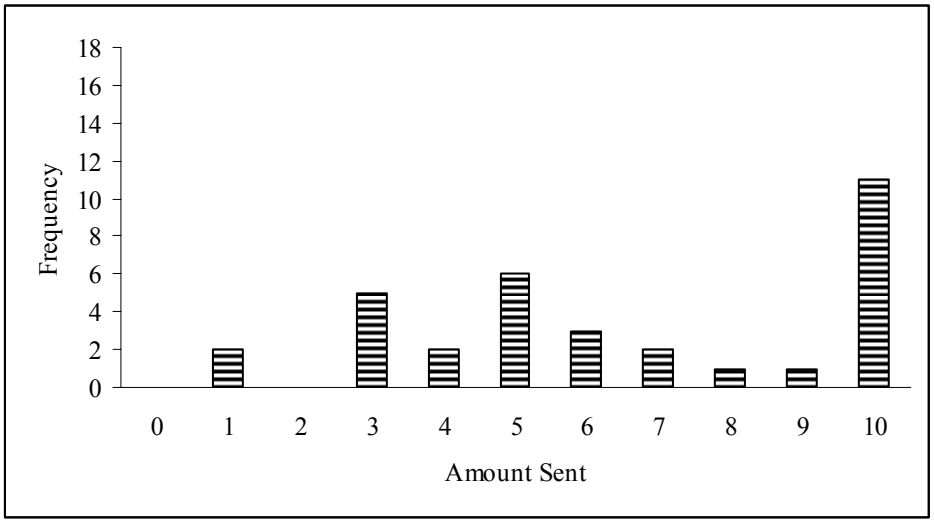
Panel A: Distribution of Amount Sent from Room A



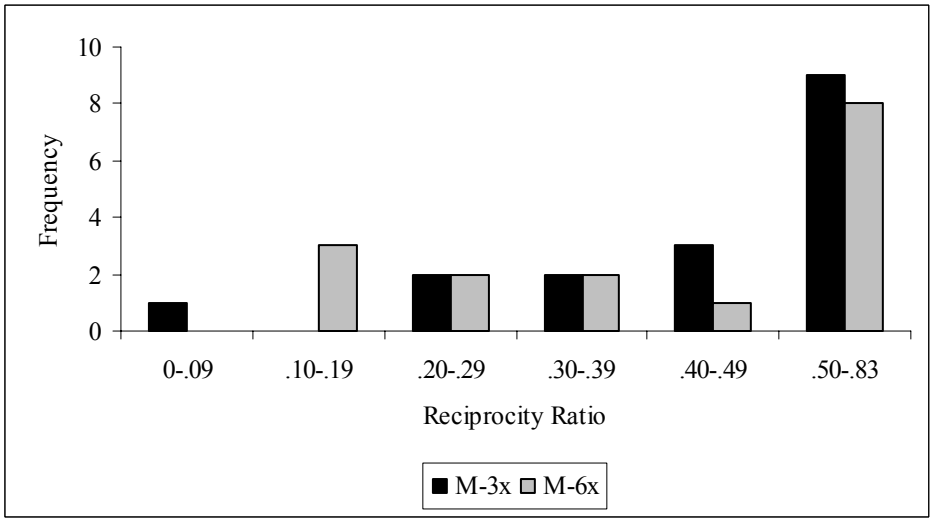
Panel B: Distribution of Reciprocity Ratio[a]

[a] The amount sent from room A to room B is increased by a multiplier of three or six (M-3x or M-6x), where the increased amount represents the total available in room B. Subjects in room B know the multiplier ex ante (at the beginning of the game), whereas those in room A learn the multiplier ex post (at the end of the game). The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.

Figure 3: Trust and Reciprocity for IDENTITY Treatment



Panel A: Distribution of Amount Sent from Room A



Panel B: Distribution of Reciprocity Ratio[a]

[a] The amount sent from room A to room B is increased by a multiplier of three or six (M-3x or M-6x), where the increased amount represents the total available in room B. Subjects in room B know the multiplier ex ante (at the beginning of the game), whereas those in room A never learn the multiplier. Subjects in room A, however, may receive a picture of their counterpart in room B at the end of the game. The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.

Table 1

Descriptive Statistics for BASE Treatment

Panel A: Subjects in Room A

Statistic	Amount Sent	Return on Trust[a]
Mean	6.36	1.10
Median	6.50	1.00
Mode	10.00	1.00
Standard Deviation	3.50	0.67
Minimum	0.00	0.00
Maximum	10.00	3.00
Observations[b]	44	40

Panel B: Subjects in Room B

Statistic	Reciprocity Ratio[c]		
	M-3x	M-6x	Combined[d]
Mean	0.30	0.22	0.26
Median	0.33	0.17	0.27
Mode	0.33	0.17	0.33
Standard Deviation	0.17	0.13	0.17
Minimum	0.00	0.00	0.00
Maximum	0.67	0.50	0.67
Observations[b]	21	19	40

[a]The return on trust is defined as the amount returned to room A divided by the amount sent from room A.
[b]Forty-four pairs of subjects participated in the BASE treatment. Four subjects in room A sent zero to room B. In this case, the return on trust is undefined and those in room B do not have the opportunity to reciprocate.
[c]The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.
[d]The combined column collapses subjects in room B with multipliers of three (M-3x) and six (M-6x) into one group.

Table 2
Descriptive Statistics for the PAYOFF Treatment

Panel A: Subjects in Room A

Statistic	Amount Sent	Return on Trust[a]
Mean	6.00	1.03
Median	6.00	1.00
Mode	10.00	0.00
Standard Deviation	3.05	0.97
Minimum	0.00	0.00
Maximum	10.00	3.14
Observations[b]	45	42

Panel B: Subjects in Room B

Statistic	Reciprocity Ratio[c]		
	M-3x	M-6x	Combined[d]
Mean	0.28	0.22	0.25
Median	0.33	0.22	0.24
Mode	0.00	0.00	0.00
Standard Deviation	0.24	0.19	0.22
Minimum	0.00	0.00	0.00
Maximum	0.67	0.52	0.67
Observations[b]	22	20	42

[a]The return on trust is defined as the amount returned to room A divided by the amount sent by room A.
[b]Forty-five pairs of subjects participated in the PAYOFF treatment. Three subjects in room A sent zero to room B. In this case, the return on trust is undefined and those in room B do not have the opportunity to reciprocate.
[c]The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.
[d]The combined column collapses subjects in room B with multipliers of three (M-3x) and six (M-6x) into one group.

Table 3
Descriptive Statistics for the IDENTITY Treatment

Panel A: Subjects in Room A

Statistic	Amount Sent	Return on Trust[a]
Mean	6.48	1.91
Median	6.00	1.67
Mode	10.00	1.00
Standard Deviation	3.02	1.01
Minimum	1.00	0.00
Maximum	10.00	5.00
Observations[b]	33	33

Panel B: Subjects in Room B

Statistic	Reciprocity Ratio[c]		
	M-3x	M-6x	Combined[d]
Mean	0.45	0.42	0.43
Median	0.50	0.46	0.50
Mode	0.67	0.50	0.50
Standard Deviation	0.18	0.18	0.18
Minimum	0.00	0.17	0.00
Maximum	0.67	0.83	0.83
Observations[b]	17	16	33

[a]The return on trust is defined as the amount returned to room A divided by the amount sent by room A.
[b]Thirty-three pairs of subjects participated in the IDENTITY treatment. Three subjects in room A sent zero to room B. In this case, the return on trust is undefined and those in room B do not have the opportunity to reciprocate.
[c]The reciprocity ratio is defined as the amount returned to room A divided by the total available in room B.
[d]The combined column collapses subjects in room B with multipliers of three (M-3x) and six (M-6x) into one group.