

Trust and the Structure of Incentives*

Robert J. Oxoby[†] Colette Friedrich[‡]

November 11, 2004

Abstract

We explore the extent to which the structure of incentive mechanisms affects individuals' behavior in a trust game. We hypothesize that the degree to which different incentive mechanisms emphasize competition (via perceived intentions of others) and entitlements (via the perceived property rights) will affect individuals' subsequent behavior. In our experiments, bargaining pairs earned endowments through either tournaments or team-based incentives. Participants then engaged in a trust game in which the sender has access to the total endowment generated by the pair. We find that the structure of the incentive mechanisms has asymmetric effects on observed trust, in which the relative earnings of the participants framed trusting behavior.

Keywords: trust, incentives, experiments

JEL classification: J31, J33, C92, D63

**Preliminary Version*: Please do not cite or circulate. This research was conducted during Colette Friedrich's research stay at the University of Calgary. Kendra McLeish provided research assistance. Financial support was provided by the University of Calgary and Friedrich Schiller University.

[†]Corresponding author: Department of Economics, University of Calgary, 2500 University Drive NW, Calgary AB Canada T2N 1N4; oxoby@ucalgary.ca.

[‡]Friedrich-Schiller Universität Jena, Wirtschaftswissenschaftliche Fakultät, Carl-Zeiß-Straße 3, 07743 Jena, Germany; C.Friedrich@wiwi.uni-jena.de.

1 Introduction

Many have argued that trust facilitates much of the internal functioning of organizations. As such, many researchers have emphasized the import of developing organizational designs that promote an environment of trust among individuals (Kramer and Tyler, eds, 1996; Mohrman et al., 1995). However, within organizations there exist significant levels of explicit and implicit contracting which may heighten or mitigate the development of trust. Many of these contracts are embedded in the incentive mechanisms individuals face. In this paper we explore the effect of different incentive structures on observed behavior in a simple trust game.

More specifically, we explore the use of relative performance evaluations (i.e. tournaments) and joint performance evaluations (i.e. team-based incentives) on behavior in the investment game of Berg et al. (1995). We find that each mechanism has a different effect on observed trust and trustworthiness, a difference which appears to depend on the relative performance of the individuals. We conjecture that the different mechanisms create different contexts for decision-making and different perceptions of one's entitlement to assets. These differences are manifest through different behaviors in the trust game.

These experiments serve to highlight the relationship between trust in organizations and incentive design and build on the large literature on behavior in trust games.¹ The experiments conducted here are also related to recent research on found money effects and the importance of earnings in bargaining games.² In this regard, most germane to this paper are the experiments of Fahr

¹See Camerer (2003) for a review of the literature. Much of this research has focused on disentangling the effects of outcomes and intentions on behavior. See Fehr and Schmidt (1999) (outcome-based model of inequity aversion) and Dufwenberg and Kirchsteiger (2004) (intention-based model of reciprocity). For experiments to this end, see Cox (2004) and McCabe et al. (2003).

²In these experiments, legitimizing assets on the part of senders (through having senders earn their wealth) leads to more self-interested behavior in dictator and ultimatum games (Cherry, 2001; Cherry et al., 2002). On the other hand, legitimizing assets on the part of

and Irlenbusch (2000) in which participants earned money prior to participating in a trust game. Three variants of this game were conducted: one in which only the trustor earned money, one in which only the trustee earned money, and one in which both the participants earned money. These experiments indicate that (i) the stronger the property rights of the trustor, the greater the amount returned by the trustee and (ii) the stronger the property right of the trustee, the greater the amount invested by the trustor. As in these experiments, participants in our experiments exerted effort to earn money. However, our interest is more on how the structure of these earnings influences behavior.

Our experiments also build on recent research examining the influence of rewards and contracts on interpersonal trust. For example, Ferrin and Dirks (2001) conducted experiments in which cooperative (i.e. team performance based) and competitive (i.e. based on relative performance) rewards were used in versions of the moon and wilderness survival tasks.³ Their results indicate that the reward structure had a strong effect on trust, with greater trust evidenced under cooperative reward structures than under competitive reward structures. The avenue for the effect of reward structure on trust was based on an attribution model in which the reward structure influenced one's perceptions of a partner's motives and intentions. Relatedly, Malhotra and Murnighan (2002) investigate the extent to which binding and non-binding contracts influence displayed interpersonal trust. In these experiments, participants played a variant of the trust game against what they perceived to be a real partner (actually a computer). The findings here suggest that non-binding contracts generate less initial cooperation but more personal (as opposed to situational) attributions for observed cooperation. As a result, they suggest that non-binding contracts interfere less with trust development than to binding contracts.

receivers leads to greater offers from senders (Ruffle, 1998).

³These tasks involve participants ranking various tools and items needed for survival in various environments. See Marcic (1995).

Our experiments investigate the effects of relative performance and joint performance evaluations on trust and trustworthiness. We focus on these two types of mechanisms as they are often observed in internal labor markets and there exists significant divergence the theoretical and practical applicability of these mechanisms.⁴ Our results provide insights into this divergence and motivate further research in the interrelationship between incentives and behavior.

We continue as follows: sections 2 and 3 describe the experiments and present the results. In our trust games with earnings, we find that the structure of the incentive mechanisms used in the earnings phase of the experiments have noticeable effects on the ways in which individuals behave in the subsequent trust game. Section 4 discusses some potential reasons for the results we observe and section 5 concludes.

2 Experimental Design

We utilized the trust game of Berg et al. (1995). In the trust game, the sender was allocated \$10 and asked to choose an investment $x \in [0, 10]$ to send to the receiver. This amount was tripled by the experimenter and the receiver was allocated $3x$. Of this amount, the receiver was asked to choose a return $y \in [0, 3x]$ to return to the sender. Final payoffs to the sender (S) and the receiver (R) are given by

$$\Pi_S = 10 - x + y, \tag{1}$$

$$\Pi_R = 3x - y. \tag{2}$$

Our treatment variable was the mechanism utilized to determine the wealth

⁴While theory often predicts the use of strong tournament style incentives, their use in practice is relatively limited. See Che and Yoo (2001), Hart and Holmstrom (1987), Prendergast (1999).

endowment available in the trust game. Our interest is in how the initial interactions required to earn wealth framed subsequent trusting behavior. As such, the earnings mechanisms are independent of the trust game.⁵

The *baseline/no earnings* treatment followed standard games in which the wealth utilized by participants was allocated in by the experimenter. In this treatment, participants were randomly matched into bargaining pairs and randomly assigned the role of either sender or receiver.

In our other treatments, participants were randomly assigned to one of two incentive conditions. In our *joint performance evaluation* (JPE) treatment, the \$10 endowment used in the trust game was earned by way of a team based incentive mechanism. Specifically, each member of the bargaining pair was given eight minutes to answer twelve questions taken from the Graduate Management Admission Test. Participants were informed that the pair would be awarded \$10 (for use in the trust game to follow) if the sum of their scores exceeded six. After the eight minute exam period elapsed, participants were informed of their score, the score of their bargaining partner, and their respective payoffs. After this information was provided, the participants were randomly assigned to the roles of sender and receiver, the sender was allocated the pairs' earnings (\$10) and the trust game ensued.

In the *relative performance evaluation* (RPE) treatment participants were informed that a tournament would be used to allocate the initial \$10 for use in the trust game. Specifically, the individual within the dyad correctly answering the most questions on the twelve question quiz would be allocated \$10, to be then given to the sender in the subsequent trust game. After the eight minute exam period had ended, participants were informed of their scores and whether they or their partner had won the tournament. Participants were then ran-

⁵This stands in contrast to other experiments, such as Sonnegard (1996), in which the first-mover in a bargaining game is determined by some test of skill or ability.

domly assigned roles in the trust game with the sender being given access to the tournament prize (\$10) for use in the game.

Note that as the total earnings from each group in our JPE and RPE treatments are allocated to a randomly determined sender, the earnings efforts are sunk costs at the time of the trust game. As such, traditional models of behavior suggest that decisions made in the trust game should be independent of the earnings mechanisms employed and the relative performance of participants in answering questions. Thus, the predicted the sub-game perfect Nash equilibrium in the trust game is $(x, y) = (0, 0)$ across all treatments.

3 Results

In this section, we analyze the results of our experiment, focusing on the ways in which the incentive mechanisms encountered in the earnings phase of the experiment influenced behavior in the subsequent trust game.

Participants

Participants were recruited for the experiment from the undergraduate student body at our university. A total of 88 individuals (44 bargaining pairs) participated in the experiment. The experiments were conducted over a closed computer network and programmed in z-Tree (Fischbacher, 1999).⁶

Trust

Table 1 provides the average investments and returns for each bargaining pair. Across all treatments, there is no difference in levels of investment (i.e. observed trust) or returns (i.e. observed trustworthiness): $F < 1$ in pairwise comparisons

⁶Instructions are provided in appendix A.

between the standard, JPE, and RPE treatments. Thus it appears that *in aggregate* the earnings phase of the experiment had little effect on behavior.

Table 1 about here

However, differences in behavior begin to emerge when looking more closely at the context in which the trust game was played. Specifically, since the roles of sender and receiver were randomly assigned within the pair, senders (and receivers) could have either been winners or losers in the tournament (under the RPE) or have “contributed” more or less towards the pair’s “output” (under the JPE). Towards this end, we examine the effect of the difference in exam scores (i.e. a participant’s own exam score minus that of her partner) on observed behavior.⁷

Across earnings treatments, this difference could have different meanings to participants. For example, under the tournament incentive, this difference could be construed by participants as a measure of the entitlements or property rights associated with the earned wealth. Under the team-based incentive, this difference could be construed as measure of one’s relative contribution to the pair’s goal

Figure 1 about here.

Table 2 splits the data based on whether the sender scored higher (referred to as a winning sender WS) or less (referred to as a losing sender LS) than the receiver in on the initial twelve question quiz. Here we find a difference in the investments made by winning and losing senders. Wilcoxon tests reject the null hypothesis that the distributions of investments across winning and losing senders are the same: $p = 0.05$ in the RPE treatment and $p = 0.09$ in the JPE

⁷We find no effect of the different incentive mechanisms on dyad’s performance on the exam: Wilcoxon tests reject are unable to reject the hypothesis that dyads’ total scores (i.e. sum of each member’s score) differ across the JPE and RPE treatments, $p = 0.620$.

treatment. Strikingly the effect is asymmetric across these earnings treatment: under the RPE, senders who won the tournament sent less than senders who had lost the tournament. However, under the JPE, senders who contributed relatively more to the pair’s aggregate score sent more than senders who contributed relatively less. Figures 1 and 2 provide the distributions of investments by the winning and losing senders under each earnings treatment.⁸ Similarly, Wilcoxon tests reject the null hypothesis that the distributions of investments across earning mechanism are the same when splitting the population by winning and losing senders. That is, winning senders sent relatively more under the JPE than under the RPE ($p = 0.038$) while losing senders sent somewhat less under the JPE than under the RPE ($p = 0.130$).

Figure 2 about here.

While this analysis treats the difference in scores within a pair as binary (the sender is either a winner or a loser), the results are more defined when looking at the actual relative scores of participants. Table 3 presents regression results restricted to the earnings treatments RPE and JPE.⁹ The variable $\Delta score$ represents the difference between an individual’s score on the twelve question quiz and that of her partner. The variable RPE is a dummy variable taking on a value of 1 in the RPE treatment and 0 in the JPE treatment. The variable ΔRPE is the interaction effect between incentive mechanism and score difference.

Table 3 about here

The regressions indicate that the lower one’s contribution to the pair’s aggregate score (i.e. the lower one’s score difference $\Delta score$), the lower a sender’s revealed trust in her partner. On the other hand, the greater the degree to which

⁸Similar differences arise in the distributions of efficiency (total earnings) across treatments.

⁹Tobit results (accounting for the censoring of choices at the 0 and 10) yield similar results.

one lost the tournament under the RPE (i.e. the lower one's score difference $\Delta score$), the greater was one's demonstrated trust (i.e. investment).

This asymmetric relationship across earnings treatments is presented in Figure 3. Again, under the tournament incentive increased differences in exam scores had a negative effect on levels of observed trust. That is, senders who had lost the tournament invested larger amounts than those senders who had won the tournament. Further, as presented in figure 3, losing (winning) senders invested more (less) when their margin of defeat (victory) was greater.

Figure 3 about here.

Behavior is markedly different under the team-based incentive. As opposed to the RPE treatments, difference in exam scores had a positive effect on levels of observed trust in the JPE treatment. That is, senders who had contributed relatively less to the dyad's aggregate score displayed less trust in their partner (see figure 3).

The effects of the RPE and JPE incentives appear to be very different on investment behaviors in the trust game. More precisely, if one interprets relative performance on the exam as a proxy for one's entitlement to the allocated assets, the effect of this proxy differed across earning treatments. In some sense, one can think of the incentive mechanisms as framing the context in which score differences are perceived and thereby influence behavior.¹⁰

Trustworthiness

As in most trust games, trust is reciprocally rewarded with trustworthiness (Berg et al., 1995; Camerer, 2003; Fehr and Gächter, 2001). As such, the greatest determinant of the amount returned y (both in terms of absolute amount and proportion received) is investment x (OLS $p < 0.01$ across all treatments).

¹⁰Similar results are obtained when examining senders' score differentials as in the analysis in Table 3 and Figure 3.

However, as in the analysis of trust, differences emerge when we explore the effects of relative performance on behavior and dissect senders' behavior. Recall that senders chose $x \in [0, 10]$. To analyze more closely the effects of incentive mechanisms on trustworthiness, we divide senders into one of three groups: senders having invested strictly less than 5 are considered self-interested (SI); senders having invested between 5 and 7 (inclusive) are considered weak trustors (WT); senders having invested strictly more than 7 are considered strong trustors (ST). Our purpose in dividing senders in this way is our conjecture that, in combination with the incentive mechanism, various levels of trust may be interpreted differently under the frame created by the incentive mechanism.

The statistical results are presented in Table 4. Results from the analysis of again demonstrate an asymmetry in the ways in which the incentive mechanisms framed trusting behavior. Note that when senders were weak trustors, receivers returned more under the RPE than under the JPE. Moreover, receivers in the JPE returned less the greater their contribution to to group's total score. This is interesting in that much of the management literature on team-based organizations (e.g. Mohrman et al., 1995) argue for team-based incentives to facilitate cooperation and promote regards for others in the organization.

Table 4 about here.

With respect to strong trustors, we again observe an asymmetric effect of the incentive mechanism: when the senders exhibited a large amount of trust (i.e. $x \geq 8$), receivers returned more under the RPE than the JPE. In addition to being the result of reciprocity, the RPE mechanism may have framed senders' behaviors differently than under the JPE. Specifically, the fact that it was losing senders who invested more under RPE implies that the winning receivers may have acknowledged the sender's adherence to the entitlements implied by quiz

scores within the dyad. That is, the losing sender under the JPE could have chosen $x = 0$ but instead opted to invest a significant amount and trust the receiver. From the receiver's standpoint, this indicates not only a level of trust, but also a respect to the implied property rights created by the RPE. As such, the trust is rewarded more than under the JPE. Interestingly, under the RPE receivers returned less the greater their margin of victory in the tournament (i.e. the score difference). Thus, while these receiver in the RPE returned more than under the JPE, they appear to have acknowledged their own property rights arising from the tournament.

With respect to the JPE when senders were strong trustors, the greater the receiver's score difference under the greater was the amount she returned. Thus, if the sender exhibited strong trust, receivers in the JPE treatment returned when they had contributed relatively more to the dyad's output (score). Thus only in instances of strong trust under the JPE do we observe, in a weak sense, the JPE creating a "team environment" in which participants cooperated more with one another.

4 Discussion

There are several possible explanations for the results we observe in these experiments.

There is a large literature exploring the effects of earnings on behavior in bargaining games. This literature finds that individuals recognize the entitlements accruing to themselves and others through the exertion of effort.¹¹In the experiments of Fahr and Irlenbusch (2000), individuals exerted effort to earn money to be used in a trust game. They find, as in our RPE treatment, that

¹¹See Cherry (2001), Cherry et al. (2002), Hoffman and Spitzer (1985), and Ruffle (1998). Much of this research points to the fact that found money effects matter (Arkes et al., 1994; Thaler, 1999). Relatedly, Sonnegard (1996) finds the behavior is influenced by framing effects associated with the description of property rights.

the stronger the perceived property right to the receiver (trustee), the more the sender (trustor) invests.

Senders' behavior in our RPE treatments are potentially explained by this adherence to perceived property rights. Senders who lost the tournament may have considered receivers as more entitled to the assets than themselves, and hence invested more. However, under RPE receivers who had won the tournament tended to return more than those who had lost. While this does not jibe as well with a property rights explanation, it may be explained by other phenomenon.

There is a growing literature exploring the effects of emotions on decision-making (Frijda, 2003; Hermalin and Isen, 2003; Loewenstein, 1996). Much of this research points to the pronounced effects that mood and emotions can have on behavior. For example, "happy" people tend to socialize more and be more cooperative. If emotions play a role in our decision environment, it may be that receivers under the RPE simply feel better and display their positive affect through (relatively) larger returns. The emotional status of these participants may be doubly influenced by not only having won the tournament, but also by having received relatively more.

On the other hand, the behavior of participants in the JPE treatment seems to go against these ideas. If one interprets the difference in exam scores between senders and receivers as a proxy for property rights, it is somewhat surprising that those senders who scored lower on the exam invested less. We posit two potential explanations for this observation. First, this may be due to these senders having had lower expectations of their partners' trustworthiness. If the property rights argument is true, senders who had contributed less may have expected their receivers to return less and therefore invested less.

Perhaps more interestingly, the ambiguous nature of property rights under

this incentive mechanism may have opened the door for senders to construe property rights in a self-serving manner. Previous research (Babcock et al., 1995, 1996; Konow, 2000) has demonstrated that individuals may manipulate their perceptions of fairness in ways which rationalize their actions or improve their self-image. In a similar spirit, senders who had contributed relatively less (i.e. scored lower on the exam) than their partnered receivers may have interpreted their contribution to the pairs target in such a way as to rationalize their property right and hence sent less.¹²

5 Conclusion

In this paper we present an experiment in which the structure of an incentive mechanism influences the way in which individuals behave in a subsequent trust game. Our preliminary results seem to indicate that property rights matter, but the interpretation of property rights depends on the context created by the incentives. Specifically, under relative performance evaluations, senders recognized the property rights accruing to themselves or their bargaining partner. However, under joint performance evaluations, where property rights are less well-defined, senders appear to have been less forthcoming in recognizing the property rights of others.

¹²On the other hand, receivers under the JPE returned larger amounts (for a given investment) when they scored relatively lower, potentially recognizing the “relative property rights” of the sender.

References

- Arkes, Hal R., Cynthia A. Joyner, Mark V. Pezzo, Karen Siegel-Jacobs, and Eric Stone, "The Psychology of Windfall Gains," *Organizational Behavior and Human Decision Processes*, September 1994, 59 (3), 331–347.
- Babcock, Linda, George Loewenstein, Samuel Issacharoff, and Colin Camerer, "Biased Judgements of Fairness in Bargaining," *American Economic Review*, 1995, 85 (5), 1337–1343.
- , Xianghong Wang, and George Loewenstein, "Choosing the Wrong Pond: Social Comparisons in Negotiations that Reflect a Self-Serving Bias," *Quarterly Journal of Economics*, 1996, 111 (1), 1–19.
- Berg, Joyce, John Dickhaut, and Kevin McCabe, "Trust, Reciprocity, and Social History," *Games and Economic Behavior*, 1995, 10, 122–142.
- Camerer, Colin F., *Behavioral Game Theory*, Princeton NJ: Princeton University Press, 2003.
- Che, Yeon-Koo and Seung-Weon Yoo, "Optimal Incentives for Teams," *American Economic Review*, 2001, 91 (3), 525–541.
- Cherry, Todd L., "Mental Accounting and Other-Regarding Behavior: Evidence from the Lab," *Journal of Economic Psychology*, 2001, 22, 605–615.
- , Peter Frykblom, and Jason F. Shogren, "Hardnose the Dictator," *American Economic Review*, September 2002, 92 (4), 1218–1221.
- Cox, James C., "How to Identify Trust and Reciprocity," *Games and Economic Behavior*, 2004, 46 (2), 260–281.
- Dufwenberg, Martin and Georg Kirchsteiger, "A Theory of Sequential Reciprocity," *Games and Economic Behavior*, 2004, 47 (2), 268–298.
- Fahr, Réne and Bernd Irlenbusch, "Fairness as a Constraint on Trust in Reciprocity: Earned Property Rights in a Reciprocal Exchange Experiment," *Economics Letters*, 2000, 66, 275–282.
- Fehr, Ernst and Klaus Schmidt, "A Theory of Fairness, Competition, and Cooperation," *Quarterly Journal of Economics*, August 1999, 114 (3), 817–868.
- and Simon Gächter, "Fairness and Retaliation: The Economics of Reciprocity," *Journal of Economic Perspectives*, 2001, 14 (3), 159–181.
- Ferrin, Donald L. and Kurt T. Dirks, "The Role of Interpersonal Trust in Organizational Settings," *Organizational Science*, 2001, 12 (4), 450–467.

- Fischbacher, Urs**, “Toolbox for Readymade Economic Experiments,” Technical Report IEW Working paper 21, University of Zurich 1999.
- Frijda, Nico H.**, “Emotions and Hedonic Experience,” in Daniel Kahneman, Ed Diener, and Norbert Schwartz, eds., *Well-Being: the Foundations of Hedonic Psychology*, New York: Russel Sage Foundation, 2003.
- Hart, Oliver and Bengt Holmstrom**, “The Theory of Contracts,” in Truman F. Bewley, ed., *Advances in Economic Theory: Fifth World Congress*, Cambridge: Cambridge University Press, 1987.
- Hermalin, Benjamin E. and Alice M. Isen**, “The Effect of Affect on Economic and Strategic Decision Making,” University of California at Berkeley working paper 2003.
- Hoffman, Elizabeth and Matthew Spitzer**, “Entitlements, Rights, and Fairness: An Experimental Examination of Subjects’ Concepts of Distributive Justice,” *Journal of Legal Studies*, 1985, *14*, 259–297.
- Konow, James**, “Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions,” *American Economic Review*, 2000, *90* (4), 1072–1091.
- Kramer, Roderick Moreland and Tom R. Tyler, eds**, *Trust in Organizations: Frontiers of Theory and Research*, New York: Sage Publishers, 1996.
- Loewenstein, George**, “Out of Control: Visceral Influences on Behavior,” *Organizational Behavior and Human Decision Processes*, 1996, *65* (3), 272–292.
- Malhotra, Deepak and J. Keith Murnighan**, “The Effect of Contracts on Interpersonal Trust,” *Administrative Science Quarterly*, September 2002, *47* (3), 534–559.
- Marcic, Dorothy**, *Organizational Behavior: Experiences and Cases*, Minneapolis, MN: West, 1995.
- McCabe, Kevin A., Mary L. Rigdon, and Vernon L. Smith**, “Positive Reciprocity and Intentions in Trust Games,” *Journal of Economic Behavior and Organization*, 2003, *52*, 267–275.
- Mohrman, Susan A., Susan G. Cohen, and Allan M. Mohrman**, *Designing Team Based Organizations*, San Francisco: Jossey-Bass, 1995.
- Prendergast, Canice**, “The Provision of Incentives in Firms,” *Journal of Economic Literature*, 1999, *37* (1), 7–63.
- Ruffle, Bradley J.**, “More is Better, But Fair is Fair: Tipping in Dictator and Ultimatum Games,” *Games and Economic Behavior*, 1998, *22*, 247–265.

Sonnegard, Joakim, “Determination of First Movers in Sequential Bargaining Games: An Experimental Study,” *Journal of Economic Psychology*, 1996, *17*, 359–386.

Thaler, Richard H., “Mental Accounting Matters,” *Journal of Behavioral Decision Making*, 1999, *12*, 183–206.

A Instructions

The following instructions were used for the earnings treatments (RPE and JPE). The instructions for the baseline treatment were identical save the exclusion of information regarding the twelve question exam.

You will be participating in an experiment during which you will be asked to make a series of decisions. Based on these decisions and those of others, you may receive a monetary payoff.

The experiment is described below. We ask that you refrain from talking to one another during the experiment. If you have any questions, please raise your arm and you will be helped by one of the experimenters. We anticipate the experiment to last approximately 30 minutes.

The experiment will proceed as follows.

1. At the start of the experiment, you will be asked to complete a questionnaire consisting of personality and behavioral questions. Once you have completed all the questions, click on the OK button. Once everyone has completed the questionnaire, the experiment will continue.
2. When the experiment continues, you will be randomly and anonymously paired with another individual in the room. You will remain paired with that individual throughout the course of the experiment.
3. In the first phase of the experiment you will be asked to complete a 12 question quiz. You will have 8 minutes to complete the quiz. The quiz will appear on your computer screen. Please use the mouse to select your answers and click the “submit answer” button after each question. While you need not answer all the questions, there is no penalty for incorrect answers. Based on your score and that of the person with whom you are paired, you will each be allocated a sum of money. The way in which this money will be determined will be listed on your computer screen before the quiz begins.
4. Once the 8 minute period for the quiz has elapsed, the experiment will continue. You will be told your score, the score of the individual whom with you are paired, and your earnings.
5. In the second phase of the experiment you will be assigned to either role A or role B.
 - (a) In role A, you will be given the total amount generated during the first phase by you and the individual with whom you are paired. You will be asked to choose an amount between zero and the amount given to send to the other individual. The amount you choose to send will be tripled by the experimenter and given to the other individual. The individual in role B will decide how much (between zero and three times the amount you sent) to return to you. After you make

your decision you will be asked an additional question. Please click the OK button once you have made your decision. You will be given a screen asking you to wait until individual B has made a decision. After you make your decision you will be asked a question. Please note that your payoff will be the money you end up with at the end of the experiment.

- (b) In role B, you will receive three times the amount the person in role A sent. While the individual in role A is making a decision, you will be given a screen asking you to wait. Once a decision has been made, you will be told what amount individual A had to distribute, what amount she sent, and the amount you received (three times the amount sent). You will be asked to decide how much of this amount received you will return to the individual in role A. After you make your decision you will be asked two questions. Please note that your payoff will be the money you end up with at the end of the experiment.

- 6. At the end of the experiment there will be a series of demographic questions and questions regarding how you perceive your partner based on their behavior. Please complete these questions.

To make sure everyone understands the experiment, please take a moment to answer the following questions:

1. Suppose you are assigned to role A and are given \$10. If you choose to send \$5, how much will the person in role B receive?
2. Suppose you are assigned to role B. The individual in role A sent \$5 and you received \$15. If you send \$5 how much will you receive as payment?
3. Given the above scenario, how much will the person in role A receive as payment?

If you have any questions during the course of the experiment, please raise your hand an experimenter will help you.

	Baseline $n = 6$	RPE $n = 17$	JPE $n = 21$
investment (x)	6.50 (3.02)	5.06 (3.40)	5.48 (2.99)
return (y)	8.00 (5.29)	5.53 (5.57)	5.24 (5.07)

Table 1: Mean investments and returns (standard deviations in parentheses).

	RPE	JPE
WS	3.14 (3.34)	6.38 (2.57)
LS	6.40 (2.88)	4.00 (3.21)

Table 2: Mean investments (x) for earning treatments (standard deviations in parentheses). The notation WS (LS) denote bargaining pairs in which the sender scored higher than the receiver on the initial quiz.

OLS	coef.	s.e.
Constant	5.429**	0.577
$\Delta score$	0.494*	0.217
RPE	-0.683	0.866
ΔRPE	-1.380**	0.328

Table 3: OLS results for investments x : ** indicates significance at $p = 0.01$; * indicates significance at $p = 0.05$. The pseudo-coefficient $\Delta RPE + \Delta score = -0.886$ is significant at $p = 0.01$.

OLS	SI ($x \leq 4$) Coef.	WT ($x \in [5, 7]$) Coef.	ST ($x \geq 8$) Coef.
n	10	13	10
$invest$	0.398	14.36**	6.76**
RPE	0.85	9.72**	5.59*
$\Delta score$	0.30	-4.66**	0.580*
ΔRPE	0.40	4.13**	-1.55*
R^2	0.438	0.756	0.845

Table 4: OLS results for returns y : ** indicates significance at $p = 0.01$; * indicates significance at $p = 0.05$. The pseudo-coefficient $\Delta RPE + \Delta score$ is significant only when senders were strong trustors (ST): $p = 0.08$.

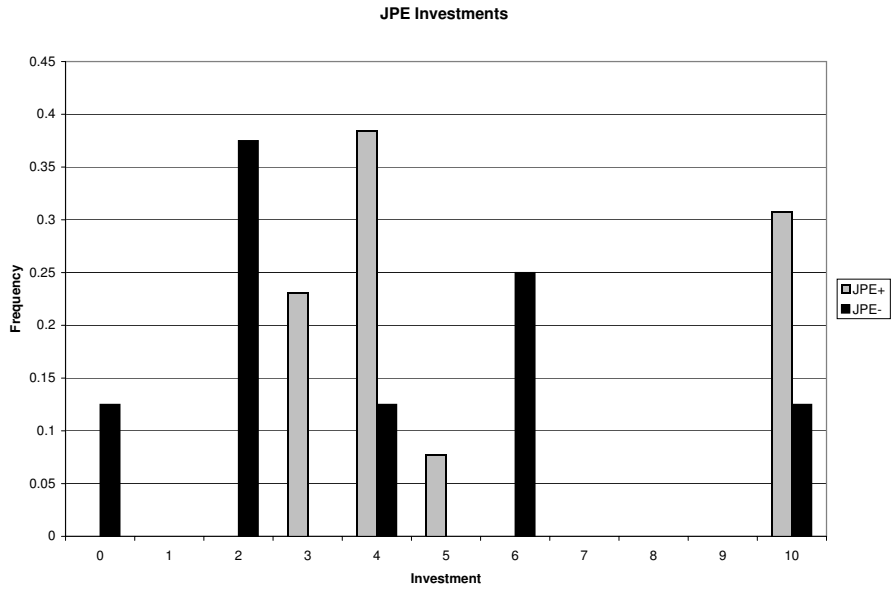


Figure 1: Distribution of investments in JPE treatment. JPE+ (JPE-) represents dyads in which the sender contributed relatively more (less) during the earnings phase. Wilcoxon $p = 0.09$

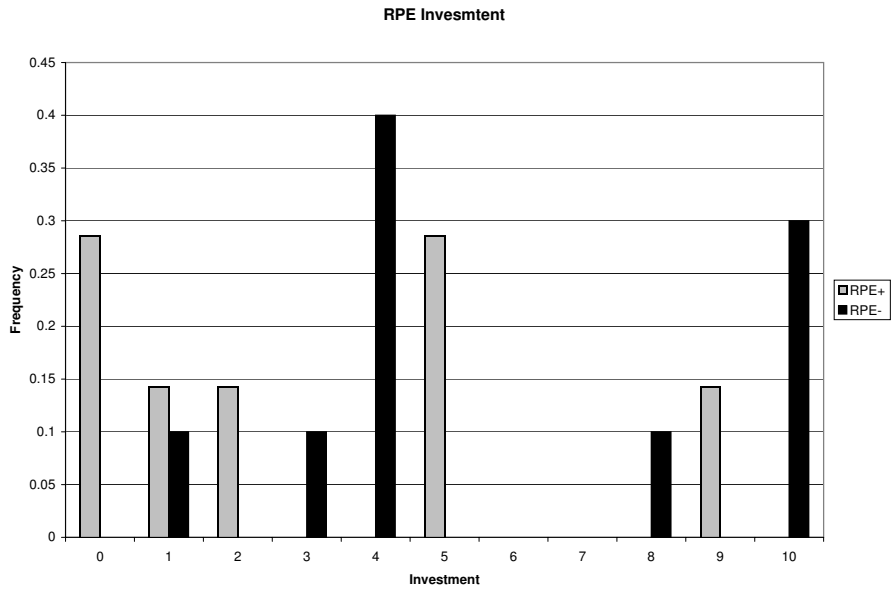


Figure 2: Distribution of investments in RPE treatment. RPE+ (RPE-) represents dyads in which the sender won (lost) the tournament. Wilcoxon $p = 0.05$

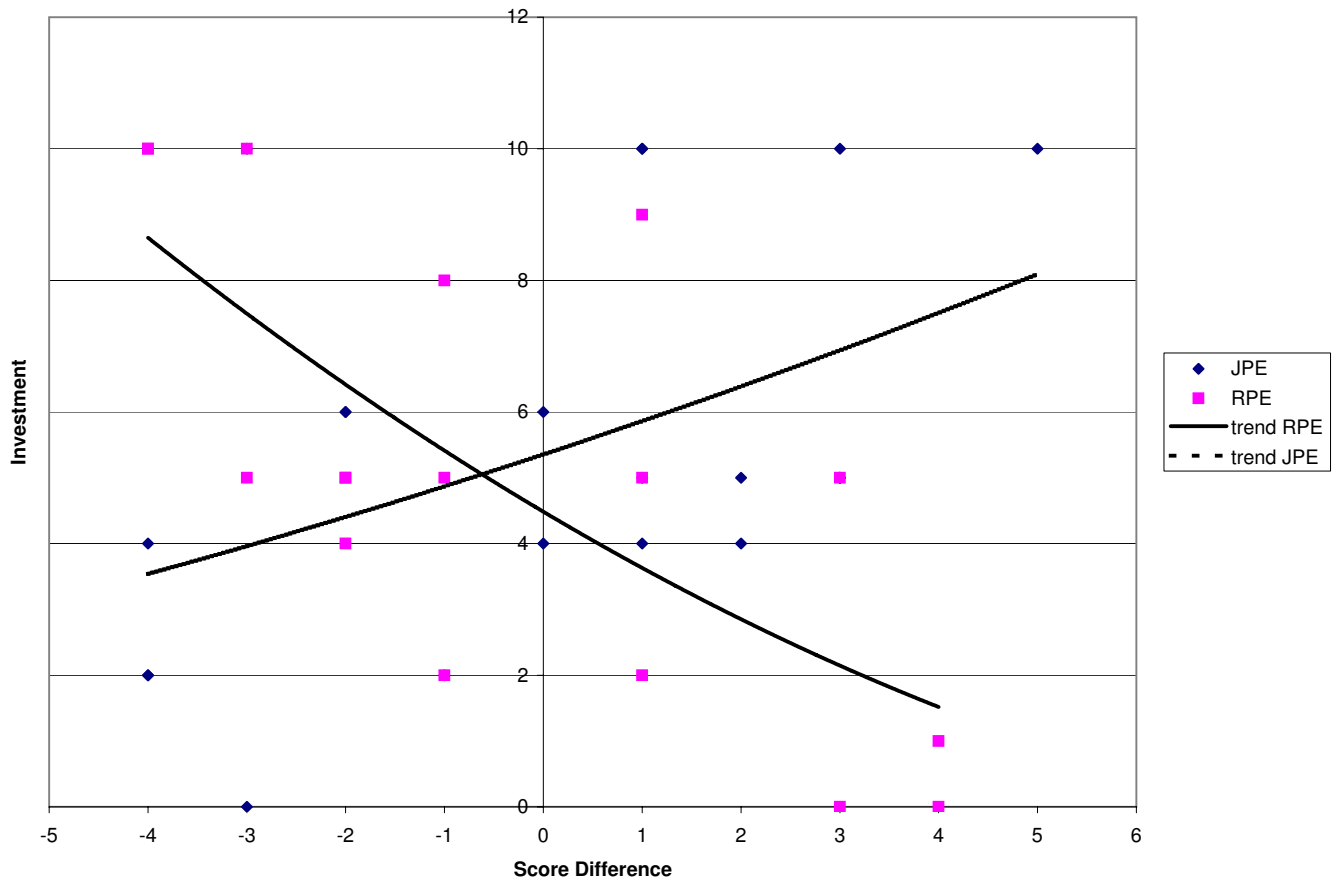


Figure 3: Investments as a function of exam score differences (sender's score less receiver's score).