



Center for Research in Economics, Management and the Arts

Is Trust a Bad Investment?

Nava Ashraf

Iris Bohnet

Nikita Piankov

Working Paper No. 2004 - 07

Is Trust a Bad Investment?*

Nava Ashraf, Iris Bohnet and Nikita Piankov[†]

This paper examines whether trust is an investment decision under uncertainty, based on the expectation of trustworthiness, and whether trustworthiness is reciprocity, conditional on one's counterpart's behavior. In trust experiments in Russia, South Africa and the United States, two thirds of the subjects who trust do not expect trust to pay monetarily. We find substantial heterogeneity in motivation: Expectations of return account for most of women's trust, and reciprocity for most of Americans' trustworthiness. Men's trust and Russians' and South Africans' trustworthiness are significantly related to unconditional kindness as measured by subjects' behavior in dictator games, using a within-subject design.

Key Words: Trust, kindness, reciprocity, gender, cross-cultural experiments. (JEL C72, C91)

*Financial support from the Russell Sage Foundation, the Center for Public Leadership and the Women and Public Policy Program at the Kennedy School of Government is gratefully acknowledged.

[†]Ashraf: Department of Economics, Harvard University; Bohnet: Kennedy School of Government, Harvard University; Piankov: Analysis Group, Boston. Corresponding author: Iris Bohnet, 79 JFK Street, Cambridge, MA02139, phone: (617) 495-5605, fax: (617) 496-5747, email: Iris_Bohnet@Harvard.edu.

I. Introduction

Recently, one of the authors found herself standing in line in a supermarket, with a basket full of groceries but no wallet. She decided to ask the person behind her whether he could lend her \$20. He did and gave her his business card so that she could return the money. No questions asked.

In such a situation, one party, the trustor, makes himself vulnerable, i.e. takes a course of action creating incentives for the other party, the trustee, to exploit him. Such behavior is commonly referred to as trust and it is assumed that the trustor would not choose the risky course of action if he did not expect the trustee to honor trust. Indeed, most definitions of trust assume that trust is a belief, namely the *expectation of trustworthiness* (e.g., Gambetta 1988, Yamagishi and Yamagishi 1994, Hardin 2002, Camerer 2003). Trustworthiness, in turn, is typically assumed to be *reciprocity* (e.g., Croson and Buchan 1999, Fehr and Gächter 2000, Camerer and Fehr 2002, Ostrom and Walker 2003).¹

This paper challenges these two assumptions. Rather than being motivated by expectations of return, the lender in the supermarket may have given the money because he enjoys helping others. And the borrower may have returned the money, not because she wanted to reciprocate the lender's kindness but rather because she derived personal satisfaction from doing so.² Such *unconditional kindness* could be due to social preferences such as altruism (Andreoni and Miller 2002), inequity aversion (Fehr and Schmidt 1999, Bolton and Ockenfels 2000) or quasi-maximin preferences (Charness and Rabin 2002) or due to psychological benefits that an individual derives

¹ Reciprocity is defined as rewarding kindness with kindness and punishing unkindness with unkindness. Behavior conditional on one's counterpart's behavior or intentions has been formalized by Rabin (1993), Falk and Fischbacher (1998), Dufwenberg and Gneezy (1998), Charness and Rabin (2002), and Cox and Friedman (2002). It has been examined experimentally in a large number of studies (for a survey, see Fehr and Schmidt 2002).

² The possibility of "altruistic trust" has been noted by Mansbridge (1999) and Kramer (1999, p. 573): "Trust needs to be conceptualized not only as a calculative orientation toward risk, but also a social orientation toward other people and toward society as a whole."

from being kind to others. We refer to the latter as *warm-glow kindness*.³ It may be such an additional benefit that motivates us to keep trusting and being trustworthy—despite the fact that trust often does not “pay” monetarily, and trustworthiness never “pays” monetarily in one-shot interactions. In his survey on experimental outcomes, Camerer (2003, p. 87) writes: “The fact that the return to trust is around zero seems fairly robust.”

The data suggest that if people perceived trust as an investment decision under uncertainty—as suggested by the name of the game most widely used to measure trust, the “investment game” (Berg, Dickhaut and McCabe 1995)⁴—they would keep making bad investments. Already in the first study by Berg et al. (1995), trustors lost money on average, a finding that by now has been replicated in many experimental studies (for surveys, see Camerer 2003 and Cardenas and Carpenter 2003). Even if subjects were informed of previous trustors’ and trustees’ behavior, the trust level did not decrease. This “social history” treatment was first used by Berg et al. (1995) and then replicated by Ortmann et al. (2000) who found that even if trustors were graphically shown that trust typically “does not pay,” their trust was not affected. Ortmann et al. also elicited trustors’ expectations of return. Only 29 percent of their trustors in the social history treatment (N=34) expected to make money in this game.

This number is surprisingly close to our results: Only 36 percent of the 159 trustors who decided to send any money in our trust game expected to make money in this game. Our paper examines this puzzle: Why do people trust even though most (correctly) expect that it does not

³ Notions of “warm glow” go back at least to Adam Smith: “How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it” (TMS, I, i, 1). More recently, Andreoni (1990) introduced “warm-glow altruism” to the study of public goods.

⁴ In the original investment game, every participant received a show-up fee of \$10. Trustors were asked how much of this endowment they wanted to send to an anonymous counterpart in a different room (the trustee). They were informed that any amount sent would be tripled by the experimenter. The trustees then had to decide how much to keep for themselves and how much to return to their respective trustors.

“pay” in one-shot interactions? We focus on single-play anonymous interactions. While excluding important contextual features that may affect trust and trustworthiness in naturally occurring settings, they measure “pure trust and trustworthiness” and provide a benchmark for comparisons with more complex environments (Camerer 2003). A large number of studies have shown that additional considerations come into play when the social distance between the parties is decreased (e.g., Roth 1995, Bohnet and Frey 1999, Charness and Gneezy 2000, Glaeser et al. 2000), or when the game is played repeatedly (e.g., Engle-Warnick and Slonim 2004, Bohnet and Huck 2004).

We use the investment game to measure trust and trustworthiness and two versions of a dictator game (Kahneman, Knetsch and Thaler 1986) to measure warm-glow kindness towards another person. In addition, subjects are confronted with a risky-choice task to control for their attitudes to risk.⁵ Studies focusing on the relationship between people’s willingness to take risk and trust behavior report mixed results. Eckel and Wilson (2004) found no relationship between risk-taking and trust behavior for American subjects while Schechter (2003) reported a strong correlation between attitudes to risk and behavior in a trust game run in Paraguay.

Our study is most closely related to two earlier experimental studies examining the relevance of unconditional kindness for trust and trustworthiness. Dufwenberg and Gneezy (2000) and Cox (2003) focus on the relevance of social preferences and compare behavior in the investment game with giving in otherwise identically structured dictator games. They find that only relatively small fractions of the money sent by the trustor and returned by the trustee are due to expectations of trustworthiness or reciprocity. Both studies use a between-subjects design. Cox (2003) assumes that expectation-based trust and reciprocity are the additive difference between

⁵ We will refer to attitudes to risk to describe our subjects’ behavior but are aware that we are dealing with relatively small stakes here and thus may want to describe behavior by attitudes to losses instead (Rabin 2000).

what is sent in the dictator and the investment game. We do not make any such strong assumptions. Rather, we use a within-subject design where the same person participates in the dictator and the investment game and test whether the two decisions are related.⁶ We thus also allow for the possibility that a person sends less in the investment than in the dictator game due to the fear of trust betrayal. Bohnet and Zeckhauser (2004) found betrayal aversion to be an important factor in trust decisions.

We run the study in three different countries, Russia, South Africa and the United States, with a racially heterogeneous sample of men and women from various socioeconomic backgrounds. We are interested in explaining the *heterogeneity in trust and trustworthiness behavior* and in whether there is *heterogeneity in the motives* accounting for observed behavior. To connect our research with earlier studies on trust, we also confronted subjects with the standard attitudinal trust question used in the World Values Survey and the General Social Survey: “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?”⁷

A better understanding of what trust is will be crucial for putting the recently discovered correlations between trust and efficiency, growth, social capital, cooperation within firms and even individual income into perspective (Fukuyama 1995, Putnam 1995 and 2000, Kramer and Tyler 1996, Knack and Keefer 1997, La Porta, Lopez-de-Silanes, Vishny and Shleifer 1997, Zack and Knack 2001, Slemrod and Katuscak 2002). Indeed, Putnam (1995) writes: “Since trust is so central

⁶ “Many people think within-subject analysis is the only proper analysis in choice experiments, because expected utility requires consistency of individual preferences. But, of course, between-subjects tests are equally legitimate (though less powerful) if the subjects in different groups can be presumed to have the same distribution of tastes, up to sampling error, because they were drawn from a single population.” (Camerer 1995: 633)

⁷ As we are interested in trust between strangers and as it is unclear which reference group people have in mind when thinking of “others,” we also included the following question: “Generally speaking, which of the following people do you feel you could trust not to cheat you: members of your family, your friends, your colleagues, members of your religion, your neighbors, citizens of your country, foreigners? (Please check all that apply.)”

to a theory of social capital, it would be desirable to have strong behavioral indicators of trends in social trust or misanthropy.”⁸

It remains unclear where trust comes from, and on what it is based. Whether the kind of trust that leads to the benefits identified above is based on kindness or based on expectations of return has policy implications. If policy makers wish to raise the level of trust, they need to know the determinants of trust. If trust is mainly a function of expected trustworthiness, they should focus on the level of trustworthiness and on beliefs about that level. In contrast, if trust is mainly motivated by warm-glow kindness, they should focus on fostering of intrinsic rewards. Recent evidence suggests that institutions such as contractual arrangements and market organization affect the intrinsic benefits people derive from cooperation and trustworthiness (Bohnet, Frey and Huck 2001, Henrich et al. 2001, Fehr and Gächter 2003).

Policy makers should also be interested in the heterogeneity in motivation. If there are differences in the motivation to trust and to be trustworthy between demographic groups, group-specific policy interventions are asked for. A sizable number of earlier studies on trust suggests demographic differences in behavior but does not analyze the underlying motivations.⁹ For example, Buchan, Croson and Solnick (2003) found in investment games run with students in the United States, that women were less trusting but more trustworthy than men. Koford (2001) found that Bulgarian students were more trusting and trustworthy than the American subjects in the experiments by Berg et al. (1995). Willinger, Keser, Lohmann and Usunier (2003) reported that

⁸ Glaeser, Laibson, Scheinkman and Soutter (2000) first took up this point and compared the until then widely used survey measures of trust with behavioral measures from investment games run with Harvard undergraduates. They found little relationship between the two concepts. This finding has been replicated by Bellemare and Kroeger (2003) with a non-student sample in the Netherlands. In contrast, for a representative sample of Germans, Fehr, Fischbacher, Rosenblatt, Schupp and Wagner (2002) report that trust attitudes and trust behavior are related.

⁹ Examples focusing on attitudinal trust measured in surveys include, for example, Putnam et al. (1993), Fukuyama (1995), Knack and Keefer (1997), Smith (1997), Inglehart (1999), Robinson and Jackson (2001), and Alesina and La Ferrara (2002).

the French trusted less than the Germans but that there was no difference in trustworthiness. Croson and Buchan (1999) reported no significant differences in trust or trustworthiness between China, Japan, Korea and the United States. Fershtman and Gneezy (2001) studied the effects of ethnic affiliation in Israeli Jewish society. Ensminger (2000) and Barr (2003) run the trust game in Africa with herders and villagers respectively. Among the Orma herders in Kenya, Ensminger probably found the lowest trust and trustworthiness levels so far.

This paper contributes to this literature but additionally analyzes motivational differences between demographic groups. While demographic characteristics can hardly be influenced by policy makers, motivations might. The paper is organized as follows. In the next Section II, we present the experimental design. Section III presents our analytical framework. Section IV discusses the experimental results and Section V concludes.

II. Experimental Design

The experiment consisted of an introduction page and five parts, which was common knowledge. After having signed a consent form, experimental participants received the introduction page detailing some general experimental rules. Subjects were informed that the experiment will consist of five parts, that they will receive the instructions for each part separately, that they will remain anonymous during the experiment (i.e. identified by code numbers) and that they will be randomly paid in the end. After having read the introduction, subjects were randomly assigned to two different rooms, one for the trustors and one for the trustees.¹⁰

In Part I, all subjects were asked to complete a questionnaire, collecting information on demographic characteristics and trust attitudes. Then, subjects were confronted with Parts II-V.

¹⁰ The experimental instructions can be made available upon request.

The sequence in which subjects participated in Parts II, III and IV was varied. In half of our sessions, subjects played these parts in order; in the other half, subjects were confronted with Part IV first before participating in Parts II and III. In Part II, all subjects played a dictator game in the role of the dictator. The dictator was asked to allocate a fixed endowment S between herself and a recipient who did not receive any money. The dictator earned $S-X$ and the recipient earned X . In Part III, all subjects played a triple dictator game in the role of the dictator. The only difference to the standard dictator game is that any amount X given to the recipient was tripled by the experimenter. Accordingly, the dictator's earnings were as before, $S-X$, but the recipient's earnings were $3X$.¹¹

In Part IV, subjects played the trust game—in room A in the role of the trustor and in room B in the role of the trustee. The only difference between the trust game and the triple dictator game was that the trustee could send back any amount of money Y between 0 and $3X$. The trustor's earnings thus were $S-X+Y$ while the trustee earned $3X-Y$. We used the strategy method where the trustees had to decide on a contingent action for every possible amount sent by the trustors.¹² In addition to indicating how much they wanted to send, we also asked trustors to report what they expected to get back.¹³

In Part V, all subjects had to indicate for six risky choice tasks whether they preferred the gamble or the certain amount. They could choose to bet on a 50%-chance of winning 300CU or

¹¹ While everyone played the game in the role of the dictator, subjects were informed that at the end of the whole experiment one of them would be randomly chosen to be the dictator and one the recipient.

¹² Brandts and Charness (2000) report no significant differences between the strategy method and the standard experimental method where a trustee responds to the observed trustor's move.

¹³ To decrease complexity in an already quite complex experiment, we chose not to reward subjects for accuracy of expectations. The evidence about whether payment increases accuracy or not is not conclusive. In a recent extensive study on the relationship between beliefs and actions, Costa-Gomes and Weizsäcker (2003) conclude that the effects of the belief elicitation procedure on actions is mostly insignificant. There is general agreement that subjects are more likely to take their counterpart's incentives into account when beliefs are elicited than when making action choices (e.g., Croson 2000, Costas-Gomez and Weizsäcker 2003).

nothing or to accept a certain amount that varied between 40CU and 140CU in the six choice tasks. The more people prefer the sure thing to the gamble, the more risk averse they are.¹⁴

Each part of the experiment was conducted like a “standard experiment”: The instructions for each part, consisting of one decision form, were distributed one at a time. After subjects had read the instructions, the experimenter read the instructions aloud and reminded subjects to include their identification number on the top of the decision form. Participants were then invited to ask questions in private (hardly any questions were asked). Subjects then had to write down their decision, fold the decision form and put it into a box, which was passed around. Completed decision forms remained in the box in front of the room until the end of the experiment. The same procedure was repeated for each part.

The endowment S was 100CU (currency units) in our experiments. Adjusted for purchasing power parity, this meant $S=\$100$ in the United States, $S=1000$ Roubles in Russia and $S=400$ Rands in South Africa.¹⁵ In the trust game, the strategy method was implemented as follows: trustors had to choose between 11 possible amounts to be passed on to the trustee (0, 10, ..., 100 CU) and trustees had to indicate for each possible positive amount how much they would return. We did not restrict subjects' choices in the dictator games. They could send any amount between 0 and 100 CU.

Subjects were paid randomly at the end of the whole experiment; they did not learn about any results during the experiment. More specifically, for each game in parts II to IV, two people (a dictator and a recipient or a trustor and a trustee) were randomly selected and matched at the end

¹⁴ For a similar approach to measuring the relevance of attitudes to risk for trust decisions, see Eckel and Wilson (2004).

¹⁵ We chose denominations such that the monetary incentives relative to subject income and living standards were approximately equal across countries. The experiments were conducted in 2001. The average lunch in the student cafeteria cost \$5 in Boston, 50 Roubles in Moscow and 20 Rands in South Africa.

of the experiment to be paid according to their choices in the corresponding game. For the individual decision task in part V, one person was randomly paid according to his or her choice.¹⁶

The experiments were conducted with 359 college students: 118 students from universities in Moscow, Russia,¹⁷ 129 students from universities in Capetown, South Africa, and 112 students from universities in Boston, United States. We ran four experimental sessions in each country, two with the dictator games first and two with the trust game first. The experimenters who ran experiments in Russia and in South Africa also ran one session in the United States. No experimenter effects could be found.¹⁸ The experiment took about one hour and thirty minutes. A show-up fee of 10CU was paid and subjects earned on average an additional 22CU.

III. Analytical Framework

Trust is defined as the amount sent, X , and trustworthiness as the amount returned divided by the amount received, that is $Y/3X$. Table A.1 in the Appendix provides the specific definitions of all our variables. The standard assumption is to model trust as an investment decision under uncertainty where trust depends on expected return (or, more precisely, the expected fraction returned) and trustworthiness as reciprocity where the fraction returned increases with the amount received. Our null hypotheses thus are:

H_0 for trust: $X = \alpha + \beta * E(Y/3X) + \gamma * \text{controls}$;

H_0 for trustworthiness: $Y/3X = \alpha + \beta * 3X + \gamma * \text{controls}$.

¹⁶ More specifically, the decision forms for each part were shuffled separately. A (blind-folded) experimental aide then picked one or two of the folded forms out, depending on the part of the experiment. Recent evidence supports the validity of the random-choice payments method. Laury (2002) found that subjects take (high) stakes at their stated value and do not scale-down to account for random payment.

¹⁷ One of the experimenters fluent in both English and Russian translated the instructions into Russian.

¹⁸ In order to ensure equivalence of experimental procedures across countries, we followed Roth et al. (1991) on designs for multinational experiments and controlled for experimenter, currency and language effects to the best of our ability.

Alternatively, trust and trustworthiness may not (only) depend on what one's counterpart does or is expected to do. Rather, they may (also) depend on the utility a person derives from being kind and giving money to another person. We propose to compare the null with two sets of hypotheses, an extreme hypothesis 1 where trust and trustworthiness only depend on unconditional kindness, and a less extreme hypothesis 2 where both, expectations of return and kindness, affect trust and trustworthiness.

H₁ for trust: $X = \alpha + \beta * \text{TDGgive} + \gamma * \text{controls}$;

H₁ for trustworthiness: $Y/3X = \alpha + \beta * \text{DGgive} + \gamma * \text{controls}$;

H₂ for trust: $X = \alpha + \beta * E(Y/3X) + \gamma * \text{TDGgive} + \delta * \text{controls}$;

H₂ for trustworthiness: $Y/3X = \alpha + \beta * 3X + \gamma * \text{DGgive} + \delta * \text{controls}$,

where TDGgive is the amount sent in the triple dictator game and DGgive is the amount sent in the dictator game. We use behavior in the dictator and the triple dictator games to assess our subjects' psychological benefits from unconditional kindness. We prefer to rely on warm-glow rather than a specific social preference profile to capture unconditional kindness because experimental evidence suggests substantial heterogeneity in subjects' social preferences profiles.¹⁹

Andreoni and Vesterlund (2001) and Andreoni and Miller (2002), for example, found evidence for the existence of at least three different types of players in dictator games when examining how dictators respond to the price of giving. We find a similar degree of heterogeneity in subjects' response modes when checking for our subjects' behavior in the dictator and the triple dictator game. In the dictator game, every dollar that the dictator sends makes the recipient \$1 better off; in the triple dictator game, a recipient receives \$3 for every dollar sent. Giving in the

¹⁹ For a different approach, see Carter and Castillo (2002).

triple dictator game thus is cheaper than in the dictator game. Table 1 summarizes our subjects' preference profiles.

Table 1: Distribution of choices in the dictator games

TDGgive=DGgive		TDGgive<DGgive		TDGgive>DGgive
Give=0CU	Give>0CU	DGgive=50CU TDGgive=25CU	DGgive?50CU or TDGgive?25CU	
14%	16%	15%	24%	31%

14 percent of our subjects are selfish and do not send anything in either game. 16 percent send the same positive amount in the DG and the TDG. 39 percent send less in the TDG than in DG, trying to (approximately) preserve whatever distributional preference they exhibited in the DG (for example, by sending 50CU in the DG and 25CU in the TDG). 31 percent respond to the decrease in the price of giving in the TDG by sending more in the TDG than in the DG.

Given this heterogeneity, we feel that assuming warm-glow kindness imposes fewer restrictions on our data than imposing one specific social preference profile on all subjects. However, we acknowledge that warm-glow kindness may seem like a relatively crude assumption for trustworthiness. It is unclear how the warm-glow derived from giving to a “poorer” recipient who does not have any money in the dictator game is related to returning money to a typically “richer” trustor who kept some of the money in the trust game. To test for the robustness of our results, we will run two sets of regressions for trustworthiness, one where we include dictator game giving directly as a proxy for warm-glow kindness and one where we use the social preference profile that describes our subjects best, fixed distributional preferences.²⁰ The latter

²⁰ Fixed distributional preferences are also compatible with inequity aversion, see Fehr and Schmidt (1999) and Bolton and Ockenfels (2000).

provides us with a measure of how much subjects would remit in the trust game based solely on the distributional preferences they exhibited in the dictator game.²¹

Holding a trustee's distributional preference constant means that her payoff must be related to her trustor's payoff in the same way her payoff as a dictator is related to her recipient's payoff. We call this the *predicted (distributional preference-based) remit function*. X indicates the amount of money sent by the trustor and $3X$ is the according amount received by the trustee. Y denotes the amount of money returned by the trustee. $DGgive$ is the amount sent in the dictator game:

$$\text{Ratio in Trust Game} = \frac{3X - Y}{100 - X + Y} = \frac{100 - DGgive}{DGgive} = \text{Ratio in Dictator Game.}$$

Accordingly, a trustee would have to return

$$Y = \frac{2X * DGgive}{100} + DGgive + X - 100.$$

The ratio to be remitted, predicted based on fixed distributional preferences, is $Y/3X$:

$$\frac{Y}{3X} = \left(\frac{2X * DGgive}{300X} \right) + \frac{DGgive + X - 100}{3X}.$$

Since the predicted ratio above can be negative, but $Y < 0$ is not a feasible choice for the trustee, we assign zero to all predicted ratios that are negative:

$$\text{predictedremit} = \max \left\{ \left(\frac{2X * DGgive}{300X} \right) + \frac{DGgive + X - 100}{3X}, 0 \right\}.$$

²¹ The problem of redistribution from "poor" to "rich" does not apply to the trustor's decision. Thus, we do not perform an analogous exercise for the trustors. In addition, if a trustor wished to send money in the trust game according to some distributional rule, his task would be much more complex than that of a trustee. A trustor needs to consider the potential actions of a trustee for every amount sent.

IV. Experimental Results

On average, our trustors send 45CU of their endowment of 100CU to their trustees (N=179), and our trustees return 27 percent of the money received to their trustors (N=1790). As we used the strategy method, we have ten times as many data points for the trustees than for the trustors because the latter indicated how much they would return for each possible positive amount sent to them.²² The method also keeps us from losing data due to those trustees who would not have received anything. In the dictator game, subjects send 25CU and in the triple dictator game 24CU (N=358) on average. The summary statistics are presented in Tables A.2a and A.2b in the Appendix.

We first note that the mean amounts sent and returned in our games are surprisingly close to the standard results in trust and dictator games despite the fact that our design substantially differs from earlier designs. We play more than one game with the same set of people, use the strategy method, offer high stakes with random payment and only give trustors (but not trustees) an endowment of S . Camerer (2003) reports in his survey of experimental results that typically dictators send about 20 percent while trustors send about 50 percent of their endowment and trustees return about the amount that trustors sent to them, i.e. about one third of the tripled amount on average. The triple dictator game has not been studied widely. Cox (2003) finds that subjects send 36 percent of their endowment on average, which is somewhat more than what we find.

The summary statistics in Tables A.2a and b do not suggest large differences in average behavior between our demographic subgroups in the three games. A Mann-Whitney and a Kolmogorov-Smirnov test reveal no significant differences in the means and the distributions of

²² We cluster the data by individuals in the regressions.

choices of men and women²³ and of Americans, Russians and South Africans in the three games. The biggest difference in behavior can be found between whites and nonwhites in the trust game, with nonwhite trustors sending 36CU and white trustors sending 48CU to their trustees (Mann-Whitney U-test, $p < 0.01$, Kolmogorov-Smirnov test, $p = 0.05$). Table A.2b shows that this result is mainly due to race effects in South Africa rather than in the United States (there is no variation in Russia as only whites participated in the experiment). In South Africa, the gap increases to nonwhites sending 33CU and whites sending 52CU while in the United States, it decreases to nonwhites sending 40CU and whites sending 43CU.

Figures 1a-1d present the distribution of choices in all games for the three countries.

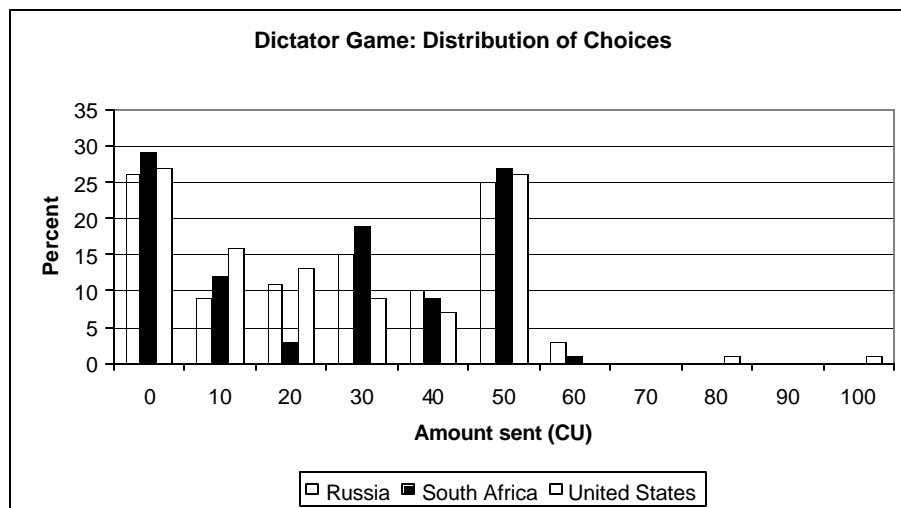


Figure 1a: Dictator game choices.

²³ The experimental evidence on gender is not conclusive. In dictator games, Bolton and Katok (1995) find no significant gender differences while Eckel and Grossman (1998) report that women send more than men. As discussed earlier, in most trust games, women tend to be less trusting but more trustworthy than men.

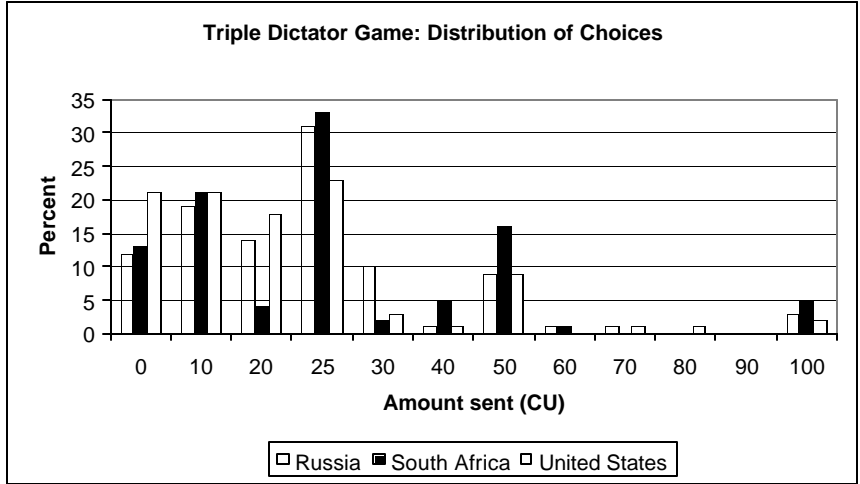


Figure 1b: Triple dictator game choices.

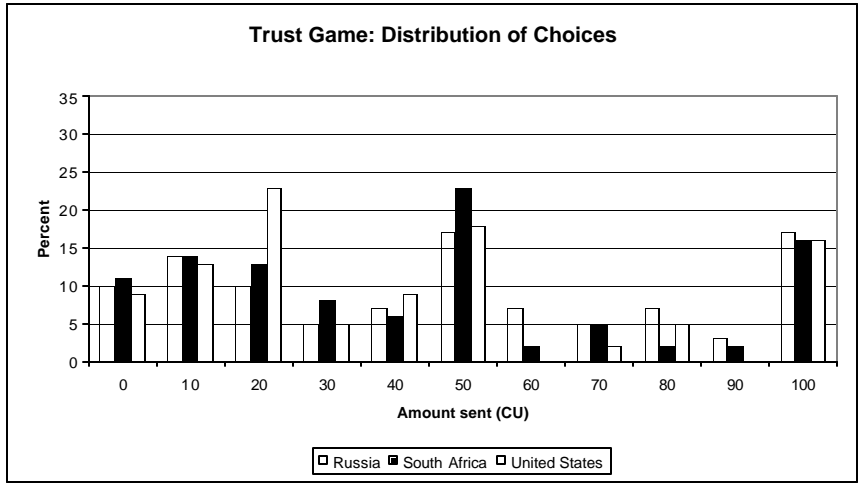


Figure 1c: Trust game choices - trustors.

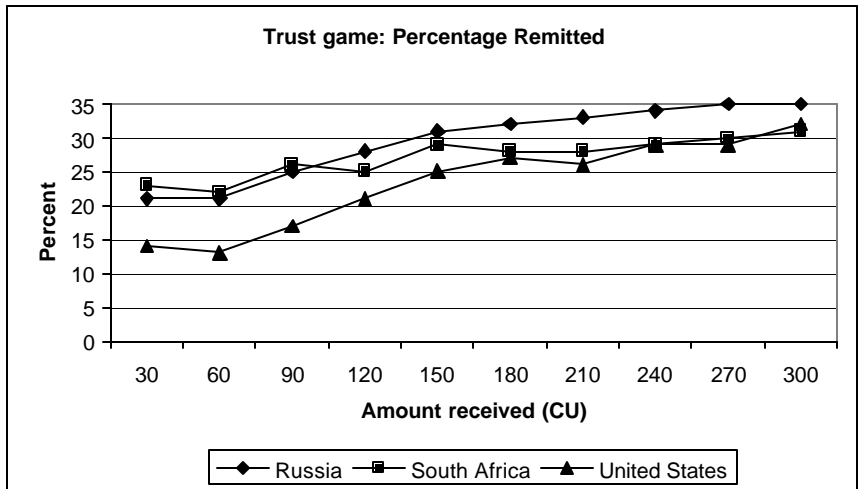


Figure 1d: Trust game choices - trustees.

While the distributions of choices indicate substantial heterogeneity, the data do not suggest that country fixed-effects will play a decisive role in explaining these behavioral variations (with the possible exception of fraction remitted). We now examine more systematically what variables account for the observed variation, focusing on the role expectations of return, kindness and reciprocity play for trust and trustworthiness.

Result 1: Trust: Expectations of return or warm-glow kindness?

159 of our 175 trustors²⁴ send a positive amount to their trustees. Out of those who trust, 38% expect to get back less than they sent, 26% expect to break even and 36% expect back more than they sent. On average, the first group, which is willing to give up own income to make the trustee better off, sends 30CU; the second group, which is hoping to break even while making the trustee better off, sends 45.5CU; and the third group, which expects to make money, sends 72.7CU. All differences are significant (Mann-Whitney U-test, $p < 0.01$).

Table 2 shows the average amounts expected back for each possible amount sent. Expectations are generally lower than the amounts sent for small amounts and higher for large amounts sent. The difference between expectations and amounts sent is especially pronounced when sending the whole endowment of 100CU: Trustors expect back 1.5 times the amount sent on average, or put differently, they expect the trustee to split the surplus created by their trust equally. This general pattern applies to all countries. Trustors sending small amounts expect slightly less back in the US than in Russia and South Africa. For amounts between 10CU and 30CU, Russians

²⁴ Out of the 179 trustors in our full sample, 2 did not answer the question to measure expectations of return, and 2 expected back a sum that they couldn't possibly get back because it was above 3 times the amount they sent.

and South Africans expect to get back about 75% of the amount sent while Americans expect to get back only 24% (Mann-Whitney U-test, $p < 0.01$).

Expectations may be rational, too pessimistic or too optimistic. Table 2 also shows how expectations of return compare to the actual return received. While it would be a heroic assumption to expect trustors to be fully rational and know what they will get back for a given amount sent, trustors may have some idea about average returns or the social norms in their respective countries. Thus, we will take as evidence for optimism (pessimism) if an individual's expectation for a given amount sent is significantly larger (smaller) than the average amount returned for a given amount sent in a country.

Expectations are surprisingly well calibrated, especially in Russia and in South Africa. Table 2 suggests no substantial differences between expectations and average amounts returned but for very large amounts sent, especially for $X=100\text{CU}$. While trustors expect to get back about 150CU, trustees only return about 100CU on average. This difference is significant, suggesting optimistic expectations (M-W U-test, $p < 0.01$). Trust only pays in Russia, on average, when sending 80CU or more.

When the trustee is entrusted with the whole endowment of 100CU, there are no significant differences between the amounts returned in the three countries. For all other categories of amounts sent (10-30CU, 40-60CU and 70-90CU), Americans remit less than Russians and South Africans, on average (M-W U-test, $p < 0.05$). Notably, American trustors expect back even less than they receive for small amounts sent (10-30CU, M-W U-test, $p < 0.1$). Americans become optimistic when sending more (40-60CU, M-W U-test, $p < 0.01$; due to the small sample size, we cannot analyze any country-level data for 70-90CU).

Table 2: Amounts expected back by Trustor and returned by Trustee, **mean**, (*st.dev.*) {N}

Amount sent by Trustor	All		Russia		South Africa		United States	
	Amount Expected	Amount Returned	Amount Expected	Amount Returned	Amount Expected	Amount Returned	Amount Expected	Amount Returned
0	0 (0.00) {16}	0 (5.73) {179}	0 (10.51) {5}	0 (6.44) {59}	0 (9.98) {6}	0 (5.38) {64}	0 (4.88) {5}	0 (4.99) {54}
10	6.65 (9.02) {23}	5.82 (5.73) {179}	9.75 (10.51) {8}	6.21 (6.44) {59}	6.88 (9.98) {8}	6.94 (5.38) {64}	2.86 (4.88) {7}	4.13 (4.99) {56}
20	7.50 (9.51) {26}	11.45 (10.91) {179}	8.00 (8.37) {5}	12.73 (12.47) {59}	13.13 (12.23) {8}	13.25 (10.17) {64}	3.85 (6.50) {13}	8.05 (9.25) {56}
30	22.27 (12.72) {11}	20.48 (16.01) {179}	30.00 (10.00) {3}	22.28 (18.10) {59}	20.00 (15.41) {5}	22.97 (15.60) {64}	18.33 (10.41) {3}	15.73 (13.11) {56}
40	34.81 (17.33) {13}	29.82 (20.30) {179}	30.00 (18.26) {4}	33.17 (23.38) {59}	30.63 (17.37) {4}	30.46 (19.20) {64}	42.00 (17.89) {5}	25.55 (17.43) {56}
50	49.29 (21.21) {35}	42.61 (25.51) {179}	40.00 (21.08) {10}	46.53 (28.75) {59}	51.67 (19.40) {15}	43.45 (24.75) {64}	55.00 (22.97) {10}	37.52 (22.13) {56}
60	64.17 (24.17) {6}	52.14 (30.62) {179}	75.00 (17.32) {4}	57.60 (35.88) {59}	42.50 (24.75) {2}	50.44 (27.71) {64}	- (-) {0}	48.32 (27.35) {56}
70	63.33 (32.51) {6}	61.29 (37.40) {179}	56.67 (37.86) {3}	68.82 (45.01) {59}	55.00 (28.28) {2}	59.37 (32.98) {64}	100.00 (0.00) {1}	55.55 (32.34) {56}
80	103.21 (12.81) {7}	72.82 (42.70) {179}	100.00 (20.00) {3}	81.17 (51.48) {59}	112.50 (0.00) {1}	68.81 (37.21) {64}	103.33 (5.77) {3}	68.59 (37.53) {56}
90	91.67 (33.29) {3}	85.19 (49.50) {179}	100.00 (42.43) {2}	96.18 (59.63) {59}	75.00 (0.00) {1}	80.29 (43.81) {64}	- (-) {0}	79.21 (42.30) {56}
100	146.55 (29.67) {29}	98.75 (55.47) {179}	145.00 (15.81) {10}	105.59 (66.50) {59}	150.00 (40.82) {10}	94.56 (49.98) {64}	144.44 (30.05) {9}	96.34 (48.53) {56}

Based on this preliminary analysis, we suspect that expectations of return are not the only motivator of a trustor's decision about whether and how much to trust his counterpart. A majority does not expect positive returns in this game. In general, trustors' expectations of return seem to be well calibrated and close to the average amount returned, the social norm, in a country. The most notable exception is "total trust," in which case trustors are too optimistic about returns. In

order to better understand what is driving the variation in our sample, we run multivariate regressions where in addition to expectations of return and warm-glow kindness, we control for attitudes to risk, a number of demographic variables, attitudes to trust and order effects. Correlations are presented in Table A.3 in the Appendix.

Table 3 below presents the regressions for the trustors. A basic model of demographic characteristics, trust attitudes and risk preferences explains very little of the variation observed (15% of the total variation, see Column 1). This basic model suggests that risk preferences do not matter for trust, that South African non-whites trust less than others and that there is an order effect: those who play the dictator game first, send less in the trust game. Column 2 presents a regression where we add the expected proportion returned, $Y/3X$, to the set of explanatory variables. This specification corresponds to the null hypothesis. The coefficient on expectations is highly significant statistically and economically: an increase in expected proportion returned by 1% increases the amount sent by 1.1CU, on average. Column 3 corresponds to the warm-glow hypothesis (H_1) as it includes the amount sent in the triple dictator game in addition to the controls. TDGgive is highly significant. Those who send 1CU more in the triple dictator game tend to send 0.7CU more in the trust game.²⁵

In Column 4 we test H_2 and find that both expectations of return and warm-glow kindness drive trust decisions, although the coefficients on both, proportion expected back and especially TDGgive, decrease in magnitude when the two are included together. Column 4 also suggests a persistent race effect in South Africa: nonwhites trust less than whites in South Africa but not in the U.S. Our findings on race are in line with earlier results on race: It is the groups that historically felt discriminated against, which are less likely to trust (Alesina and LaFerrara 2002).

At the beginning of the 21st century, such discrimination is more prevalent in South Africa than in the United States. The order in which the games were played is marginally significant at the 10%-level.

Including expectations of return and warm-glow kindness substantially increases the variation explained. Adding expectations of return in Column 2 takes the R-squared from 0.15 to 0.58; adding the amount sent in the triple dictator game in Column 3 allows us to explain 31% of the variation. The full model, including both expectations of return and warm-glow kindness, explains 62% of the variation in our sample.

Columns 5 and 6 show that those who send a lot in the trust game (50CU or more) are significantly more motivated by expected returns than those who send little (less than 50CU). The first group's trust is not related to triple dictator game giving. In contrast, warm-glow kindness is very relevant for those who trust little. The latter group's decisions are also related to their risk aversion.

Those who send a lot are more likely to conform to the null hypothesis: They play an investment game under uncertainty and base their decisions only on expected returns. In contrast, those who send little base their decision more on unconditional kindness and less on their expectations of return, supporting Hypothesis 2. For the latter group, trust seems to be more of a general "social orientation," as psychologist Roderick Kramer put it, while the first group perceives the trust game as a strategic interaction between the trustor and the trustee, where trust is the "expectation of trustworthiness," as assumed by most researchers in the field.

²⁵ Note that 24 of our trustors send less in the trust game than in the triple dictator game, suggesting that expectation-based trust is not just the additive difference between what is sent in the trust and the triple dictator game.

Table 3. Determinants of amount sent in the trust game²⁶

	(1) Controls only	(2) H ₀	(3) H ₁	(4) H ₂	(5) H ₂ , if X = 50	(6) H ₂ , if X < 50
Prop. expected back		112.774 (8.969)***		101.291 (9.005)***	83.924 (16.300)***	34.922 (7.230)***
TDGgive			0.708 (0.119)***	0.379 (0.093)***	0.142 (0.110)	0.411 (0.098)***
Risk aversion	-1.702 (1.580)	-1.054 (1.115)	-2.165 (1.432)	-1.368 (1.066)	0.421 (1.376)	-2.082 (0.863)**
Dictator 1st (yes=1)	-17.227 (4.987)***	-6.399 (3.618)*	-15.410 (4.524)***	-6.530 (3.449)*	-0.799 (4.864)	-4.324 (2.523)*
South Africa	12.728 (9.128)	9.196 (6.438)	6.345 (8.330)	6.143 (6.183)	1.621 (8.534)	0.349 (4.476)
Russia	5.910 (7.882)	0.751 (5.570)	7.773 (7.140)	2.272 (5.322)	4.976 (7.611)	-5.755 (3.675)
US non-white	-6.346 (8.979)	-0.963 (6.342)	-0.609 (8.184)	1.556 (6.078)	2.018 (9.128)	-0.174 (4.008)
SA non-white	-28.447 (8.997)***	-18.110 (6.394)***	-19.241 (8.289)**	-14.240 (6.169)**	-13.032 (9.175)	-7.326 (4.413)
Gender (male=1)	-5.128 (5.405)	-3.112 (3.813)	-6.079 (4.895)	-3.826 (3.639)	1.875 (5.548)	-2.990 (2.448)
Age group (1-6)	-0.480 (4.167)	-1.046 (2.937)	-1.137 (3.773)	-1.340 (2.800)	-0.798 (3.537)	-1.237 (2.176)
Econ. situation (1-6)	-3.985 (2.805)	-3.627 (1.977)*	-3.149 (2.542)	-3.217 (1.887)*	-1.115 (2.860)	-1.119 (1.320)
Economics major	1.520 (6.628)	-4.354 (4.694)	4.178 (6.015)	-2.335 (4.502)	-2.256 (6.048)	-0.475 (3.241)
# of organizations	-0.674 (1.951)	-1.393 (1.376)	-0.083 (1.769)	-1.003 (1.316)	1.964 (2.174)	-0.412 (0.856)
Trust strangers	1.781 (6.787)	-0.582 (4.786)	-1.013 (6.160)	-1.835 (4.573)	-3.183 (5.736)	-6.198 (3.678)*
Constant	74.334 (16.562)***	39.410 (11.997)***	55.618 (15.317)***	32.960 (11.546)***	34.225 (16.502)**	28.541 (8.844)***
Observations	168	168	168	168	82	86
R-squared	0.15	0.58	0.31	0.62	0.35	0.47
Adjusted R-squared	0.09	0.55	0.25	0.59	0.22	0.37

The dependent variable is X, the amount sent in the trust game. Standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

²⁶ Our sample size for the trust regressions is 168. From our complete sample of 179, we lose 7 subjects because of missing observations for one of the independent variables, 2 subjects who expected to get back more than 3 times what they sent, and exclude 2 outliers. These are a Russian man and a South African black woman who both send 10CU and expect to get back 30CU. If we include them, expectations of return become less correlated with amount sent while warm-glow kindness gains in importance. While this would strengthen the message of this paper, we prefer our results not to be significantly influenced by these two outliers.

Why might some people play the trust game as an investment game while others perceive it as a decision about whether to do good or not? We test for three possible conjectures: (i) Order effects: those who play the dictator games before they play the trust game may mentally anchor on the triple dictator game. If this were the case, these trustors would be less likely to take expected return into account and more likely to be motivated by unconditional kindness than trustors who play the trust game first. (ii) Expecting positive returns: those who expect to make money in the trust game may be more likely to base their decisions on expectations of return rather than on unconditional kindness. (iii) Demographic variables: Some subgroups may be more likely than others to base their decisions on expectations of return rather than on unconditional kindness.

We control for these possible effects in Table 4. We find no evidence that those who played the dictator games first are more influenced by unconditional kindness and less by expected return than others (Column 1). Similarly, those who expect to make money in the trust game are not motivated significantly differently than others (Column 2). Those who do not expect to make money may also care about expected returns because, as suggested by Table 1, many of our subjects have a social preference profile requesting the inclusion of amounts returned, for example, fixed distributional preferences.

In contrast, Column 3 suggests that there is a gender difference in motivation: Men's trust is strongly affected by unconditional kindness while women's trust is not. Women are (marginally) more strongly motivated by their expectations of return than men are. Column 4 shows that our results for large amounts sent in Table 3 are mainly driven by women: It is the women who are only motivated by expected returns but not by warm-glow kindness to send large amounts in the trust game, not the men. There are no gender differences for small amounts sent (Column 5). The difference in the motivation to trust between men and women is especially noteworthy as there are

basically no differences in the distribution of men's and women's trust choices (see Figure A.1 in the Appendix). Table A.4 in the Appendix shows that this gender difference is by far the most pronounced difference in motivation between demographic groups.

Our findings accord well with Buchan et al.'s (2003) large-scale study on trust and gender where male trustors are more likely than women to report in a post-experimental questionnaire that trust is about cooperation (rather than competition). However, the authors do not control for kindness directly and do not find any gender differences in the role expectations of return play.

Table 4. Subgroup differences in the determinants of amounts sent in the trust game

	(1)	(2)	(3)	(4)	(5)
	H ₂	H ₂	H ₂	H ₂ , if X = 50	H ₂ , if X < 50
Proportion expected back	95.560 (13.274)***	76.691 (14.550)***	115.781 (12.009)***	70.271 (23.469)***	46.436 (10.857)***
TDGgive	0.501 (0.127)***	0.480 (0.120)***	0.074 (0.157)	-0.285 (0.188)	0.398 (0.146)***
Risk aversion	-1.279 (1.067)	-1.633 (1.065)	-1.340 (1.047)	0.428 (1.323)	-2.061 (0.864)**
Dictator 1st (yes=1)	-3.627 (6.547)	-6.325 (3.455)*	-6.230 (3.443)*	2.216 (4.836)	-4.530 (2.534)*
Gender (male=1)	-4.525 (3.698)	-3.517 (3.616)	-7.373 (6.397)	-24.349 (15.673)	-0.810 (4.410)
Trust strangers	-1.145 (4.601)	-1.974 (4.696)	-0.681 (4.584)	-0.060 (5.731)	-6.465 (3.823)*
Dictator 1 st x Proportion expected back	12.109 (18.880)				
Dictator 1 st x TDGgive	-0.270 (0.188)				
Expected positive return		6.664 (26.728)			
Expected positive return x Proportion expected back		23.107 (54.194)			
Expected positive return x TDGgive		-0.220 (0.190)			
Male x Proportion expected back			-32.390 (17.394)*	17.032 (32.560)	-19.985 (14.134)
Male x TDGgive			0.493 (0.198)**	0.629 (0.232)***	0.034 (0.213)
Demographic controls	Yes	Yes	Yes	Yes	Yes
Constant	31.418 (12.201)**	31.785 (11.658)***	35.189 (11.637)***	52.007 (18.735)***	26.936 (9.134)***
Observations	168	168	168	82	86
R-squared	0.63	0.64	0.64	0.42	0.49
Adjusted R-squared	0.59	0.59	0.60	0.28	0.37

The dependent variable is X, the amount sent in the trust game. Standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Result 2: Trustworthiness: Reciprocity or warm-glow kindness?

A trustee returns money to the trustor if she is motivated by reciprocity and/or unconditional kindness. The positive relationship between amounts received and amounts remitted has mostly been interpreted as an indicator for reciprocity in the literature so far.²⁷ However, without further analysis the conclusion that a positive slope of the return function is an indicator for reciprocity seems only warranted for unconditionally selfish players who send nothing in the dictator game. Any positive fraction that they return in the trust game cannot be due to innate kindness. For everyone else, however, a positive relationship between amounts received and fractions remitted warrants further analysis.

Figure 2 provides suggestive evidence for the relevance of unconditional kindness. For illustrative purposes, we assume a fixed distributional preference profile for all our trustees. We present the relationship between amounts received and fractions remitted for three specific preference profiles, the selfish who do not send anything in the dictator game, egalitarian dictators who share the pie equally, and others.

²⁷ For example, Camerer and Fehr (2002, p. 18) write: “The amount trustees repay increases with y [the amount sent by trustors], which can be interpreted as positive reciprocity, or a feeling of obligation to repay more to an Investor who has exhibited trust.”

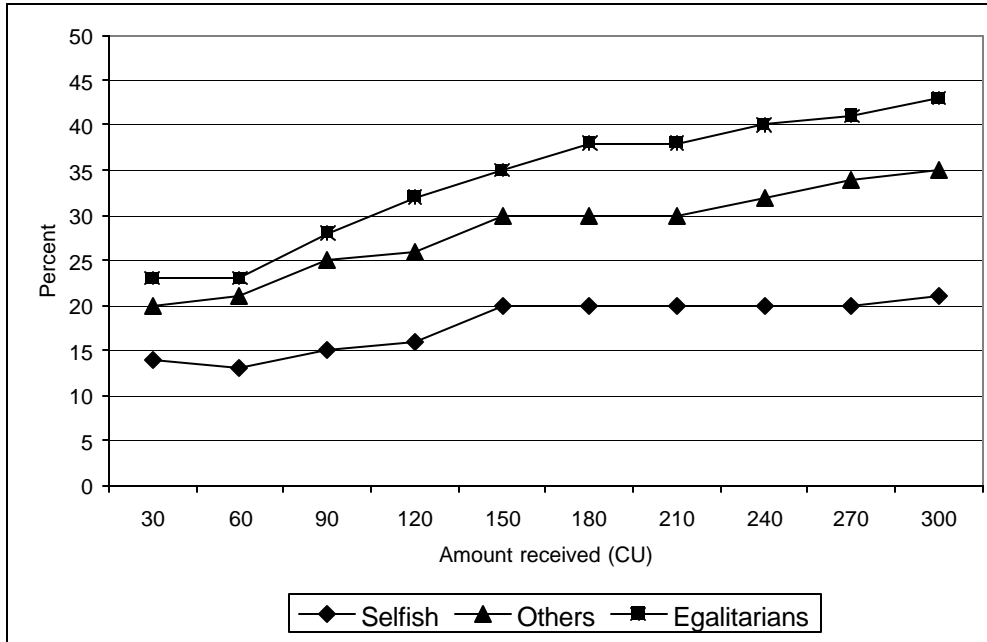


Figure 2: Fractions remitted in the trust game by distributional preference type

Egalitarian types remit substantially more than selfish types. While the positive fraction remitted by the selfish cannot be due to kindness, the egalitarians' (and others') increasing slope of the remit function could be related to unconditional kindness or to reciprocity. As trustors send more money to the trustees (and keep less for themselves), trustees have to return proportionally more money to live up to their distributional preferences. An egalitarian type with fixed distributional preferences, for example, would not remit any money for small amounts sent but would remit 50% if she received 300CU. Figure 3 illustrates how much an egalitarian type who sends 50CU in the dictator game would have to remit in the trust game according to the predicted remit function introduced above, i.e., if she were motivated by her distributional preferences only. The theoretical preference-based remit function is compared with the experimentally observed remit function.

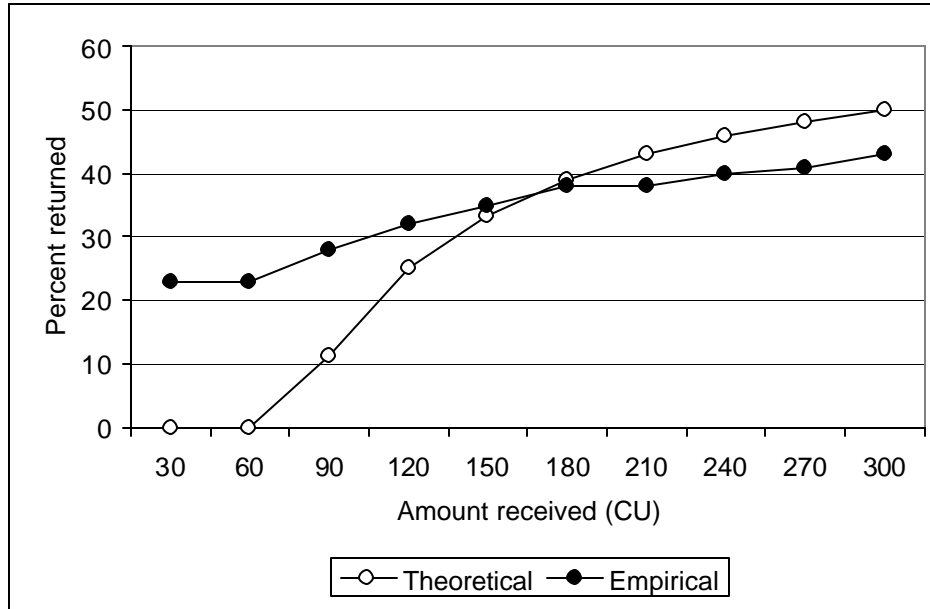


Figure 3: Fractions remitted by egalitarian types-based on their predicted (theoretical) and observed (empirical) remit functions.

Figure 3 shows that egalitarian types remit more than predicted by the preference-based theoretical remit function when sent small amounts and less when sent large amounts. This pattern does not suggest that these players are motivated by reciprocity.

In order to differentiate between the two motives more precisely, we run a regression. We only take it as an indicator of reciprocity if the percent returned, $Y/3X$, increases with the amount received, $3X$, *controlling for kindness*. To test for whether the specification of kindness affects results, we control for warm-glow kindness and fixed distributional preferences. In Table 5, we include the amounts sent in the dictator game directly into our regressions in Column 3 and use a fixed distributional preference profile in Column 4.

Table 5 presents the regression results for the trustees. Our control variables in Column 1 explain only 7% of the variation in our sample. Two control variables are significant. Russians remit more than others and “Trust strangers” is related to the percentage returned, suggesting that generally, the trust question picks up trustworthiness rather than trust. This finding is line with

Glaeser et al.'s (2000) results for Harvard undergraduates. When our main explanatory variables – amount received in the trust game, amount given in the dictator game and predicted distributional preference – are included, all have high statistical and economic significance. Testing the null hypothesis, we find that one extra CU received increases the percentage of the money returned by 0.05% (Column 2), which means that when a subject receives the full 300CU, she returns about 16% of the amount received. Testing hypothesis 1, our subjects return 0.3% more of the amount received for every CU they send in the dictator game (Column 3), meaning that an “egalitarian” person who splits the money equally in the dictator game will return 15% more than an egoist who keeps all the money in the dictator game.

When reciprocity (Amount received) and warm-glow (DGgive) are combined to test H2 (Column 5), both variables maintain their levels and significance, suggesting that these two factors coexist in the decision process. However, if warm-glow is replaced by predicted remit, based on distributional preferences, the effects of reciprocity disappear (Column 6). This suggests that the observed positive slope of percentage returned need not be based on people’s willingness to reward trust by being kind in return. They may only care about their distributional preferences. Independent of the specification, including the behavioral variables increases the variation explained to a bit more than 20%.

Table 5. Determinants of percentage returned in the trust game²⁸

	(1) Controls only	(2) H ₀	(3) H ₁ , based on DGgive	(4) H ₁ , based on predicted remit	(5) H ₂ , based on DGgive	(6) H ₂ , based on predicted remit
Received (3X)		0.00052 (0.00006)***			0.00052 (0.00006)***	0.00010 (0.00009)
DGgive			0.003 (0.001)***		0.003 (0.001)***	
Predicted remit				0.442 (0.051)***		0.416 (0.066)***
Risk aversion	-0.009 (0.009)	-0.009 (0.009)	-0.010 (0.008)	-0.009 (0.008)	-0.010 (0.008)	-0.009 (0.008)
Dictator 1st (yes=1)	-0.023 (0.024)	-0.023 (0.024)	-0.014 (0.021)	-0.016 (0.021)	-0.014 (0.021)	-0.016 (0.021)
South Africa	0.028 (0.038)	0.028 (0.038)	0.024 (0.036)	0.026 (0.036)	0.024 (0.036)	0.026 (0.036)
Russia	0.073 (0.033)**	0.073 (0.033)**	0.061 (0.030)**	0.060 (0.030)**	0.061 (0.030)**	0.061 (0.030)**
US non-white	0.011 (0.035)	0.011 (0.035)	0.033 (0.036)	0.022 (0.035)	0.033 (0.036)	0.021 (0.035)
SA non-white	-0.019 (0.038)	-0.019 (0.038)	-0.023 (0.035)	-0.025 (0.035)	-0.023 (0.035)	-0.025 (0.035)
Gender (1=male)	-0.004 (0.024)	-0.004 (0.024)	0.003 (0.022)	0.002 (0.022)	0.003 (0.022)	0.002 (0.022)
Age Group (1-6)	0.001 (0.021)	0.001 (0.021)	0.001 (0.019)	0.001 (0.019)	0.001 (0.019)	0.001 (0.019)
Economic situation (1-6)	-0.001 (0.011)	-0.001 (0.011)	0.003 (0.011)	0.004 (0.011)	0.003 (0.011)	0.004 (0.011)
Economics major	0.044 (0.031)	0.044 (0.031)	0.026 (0.028)	0.027 (0.029)	0.026 (0.028)	0.028 (0.029)
# of organizations	-0.002 (0.008)	-0.002 (0.008)	-0.002 (0.007)	-0.001 (0.007)	-0.002 (0.007)	-0.001 (0.007)
Trust strangers	0.085 (0.028)***	0.085 (0.028)***	0.054 (0.025)**	0.057 (0.025)**	0.054 (0.025)**	0.059 (0.025)**
Constant	0.257 (0.073)***	0.172 (0.074)**	0.174 (0.070)**	0.196 (0.068)***	0.089 (0.071)	0.184 (0.069)***
Observations	1770	1770	1770	1770	1770	1770
R-squared	0.07	0.13	0.18	0.22	0.24	0.23
Adjusted R-squared	0.06	0.12	0.18	0.22	0.24	0.22

The dependent variable is Y/3X, the amount returned divided by the amount received. Standard errors in parentheses; observations are clustered by individual. * significant at 10%; ** significant at 5%; *** significant at 1%

In Table 6, we split our sample into two categories: those who receive a lot (>150) and those who receive little (≤150). As we use the strategy method, we can see how trustees respond to

²⁸ Our sample size for the trustworthiness regressions is 177. From our complete sample of 179, we lose 2 subjects because of missing observations for one of the independent variables.

each possible amount received. The results support the intuition in Figure 3. Behavior is more contingent on the trustor's actions for small than for large amounts received. Controlling for distributional preferences, reciprocity does not matter at all for large amounts received.

Table 6: Determinants of percentage returned for large and small amounts received in trust game

	Receive>150	Receive≤150	Receive>150	Receive≤150
Received (3X)	0.00034 (0.00007)***	0.00077 (0.00011)***	-0.00001 (0.00009)	0.00036 (0.00015)**
DGgive	0.0041 (0.0006)***	0.0025 (0.0006)***		
Predicted remit			0.426 (0.064)***	0.431 (0.101)***
Risk aversion	-0.011 (0.009)	-0.009 (0.008)	-0.011 (0.009)	-0.008 (0.009)
Dictator 1st (yes=1)	-0.015 (0.023)	-0.013 (0.023)	-0.016 (0.023)	-0.016 (0.024)
Trust strangers	0.049 (0.026)*	0.059 (0.030)*	0.051 (0.026)**	0.065 (0.030)**
Demographic controls	Yes	Yes	Yes	Yes
Constant	0.097 (0.078)	0.101 (0.076)	0.192 (0.078)**	0.176 (0.076)**
Observations	885	885	885	885
R-squared	0.27	0.18	0.26	0.16
Adjusted R-squared	0.26	0.17	0.25	0.14

The dependent variable is $Y/3X$, the amount returned divided by the amount received. Standard errors in parentheses; observations are clustered by individual. * significant at 10%; ** significant at 5%; *** significant at 1%

Are there any groups of people who base their decisions exclusively on warm-glow kindness or reciprocity? Like in the trust regressions, we do not find any evidence that the order in which the games were played interacts with subjects' motivations for trustworthiness. An analysis of trustee behavior by subgroups (Table A.5, see Appendix) reveals that most demographic subgroups are motivated by reciprocity and warm-glow kindness—with one exception: In the US, the warm-glow effect is almost non-existent, while the reciprocity effect is the strongest of all subgroups. Using distributional preferences instead of warm-glow (Table A.6, see Appendix) produces similar results. All subgroups behave similarly except for the US: distributional preferences matter least for Americans; at the same time, this is the only subgroup that maintains a

significant reciprocity effect (Amount received). Based on the results in Tables A.5 and Table A.6 we conclude that Americans' trustworthiness is overwhelmingly driven by reciprocity rather than by unconditional kindness — in contrast to Russians' and South Africans' trustworthiness.

V. Conclusions

In his book on “Behavioral Game Theory”, Colin Camerer (2003) suggests that one of the “Top Ten Open Research Questions” is the following: “What game do people think they are playing?” Our results suggest that many people may play a different game than researchers thought they were playing when confronted with the investment game. Only a minority of subjects in Russia, South Africa and the United States, namely women who entrust their counterpart with at least half of the pie, are exclusively motivated by expected returns, suggesting that they perceive the trust game as an investment decision under uncertainty. Men, and women who send less than half of the pie to their trustee, are also motivated by unconditional kindness. Similarly, only for a fraction of our subjects is trustworthiness based on reciprocity. Being kind to people in return to their kindness matters for Americans but hardly for Russians and South Africans who are more influenced by unconditional kindness.

Two interpretations are possible: The first one is that the investment game does not measure trust and trustworthiness accurately. The second one is that we have not conceptualized trust and trustworthiness correctly: Trust may in fact not only be an investment decision under uncertainty and trustworthiness not only reciprocity. We lean towards the second conclusion. As psychologist Kramer (1999) puts it, trust is also a “social orientation toward people and toward society as a whole”.

We would not have discovered the comparatively small role that expectations of return and reciprocity play for a majority of the subjects in our sample had we only compared means. We also would have neglected the substantial heterogeneity in the motivations for trust and trustworthiness. We suspect that some of the mixed evidence on the possible determinants of trust and trustworthiness found in earlier experiments may be due to the characteristics of the subject pool and could be reconciled if it was checked for whom unconditional kindness, expectations of return, and reciprocity did or did not matter.

For example, while Cox (2003) and Dufwenberg and Gneezy (2000) found little evidence for reciprocity, McCabe, Rigdon and Smith (2003) found strong support for reciprocity. No conclusive evidence can be found in other experiments on rewarding behavior either. Reciprocity has been reported to play no or only a minor role in a gift exchange game (Charness 1996), in a sequential social dilemma experiment (Bolton, Brandts and Ockenfels 1998), and in a real life public goods experiment (Frey and Meier 2004), for example, while it has been found to affect behavior in a moonlighting game (Falk, Fehr and Fischbacher 2000).

Our experiments are a first attempt at better understanding what motivates people to do the things they do, by including preferences as revealed by behavior as explanatory variables. We believe that many other economic experiments could benefit from a combination of within- and between-subjects designs.

Our design allowed us to solve one of the important trust puzzles, namely that people trust even though hardly anyone makes money by doing so. We found that generally, people are aware of this. They trust even though they know it does not pay monetarily. They enjoy being kind to others, even to anonymous strangers. If these psychological returns of trust are taken into consideration, people may not make a bad investment when trusting.

References

- Alesina, Alberto and Elena La Ferrara, "Who Trusts Others?" *Journal of Public Economics* 85(2002), 207-34.
- Andreoni, James, "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving?" *Economic Journal*, 100 (1990), 464-77.
- Andreoni, James, and John Miller, "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism," *Econometrica*, 70(2002), 737-53.
- Andreoni, James, and Lise Vesterlund, "Which is the Fair Sex? Gender Differences in Altruism," *Quarterly Journal of Economics*, 116(2001), 293-312.
- Barr, Abigail, "Trust and expected trustworthiness: experimental evidence from Zimbabwean villages," *Economic Journal*, 113(2003), 614-30.
- Bellemare, Charles, and Sabine Kröger, "On Representative Trust," Working paper, Humboldt University Berlin, 2003.
- Berg, John, John Dickhaut, and Kevin A. McCabe, "Trust, Reciprocity, and Social History," *Games and Economic Behavior*, 10(1995), 290-307.
- Bohnet, Iris, and Bruno S. Frey, "Social Distance and Other-Regarding Behavior in Dictator Games: Comment," *American Economic Review*, 89(1999), 335-39.
- Bohnet, Iris, and Steffen Huck, "Repetition and Reputation: Implications for Trust and Trustworthiness When Institutions Change," *American Economic Review*, forthcoming, 2004.
- Bohnet, Iris, and Richard Zeckhauser, "Trust, Risk and Betrayal," *Journal of Economic Behavior and Organization*, forthcoming, 2004.
- Bohnet, Iris, Bruno S. Frey, and Steffen Huck, "More Order With Less Law: On Contract Enforcement, Trust and Crowding," *American Political Science Review*, 89(2001), 335-39.
- Bolton, Gary, and Elena Katok, "An Experimental Test for Gender Differences in Beneficent Behavior," *Economics Letters*, 48(1995), 287-92.
- Bolton, Gary, and Axel Ockenfels, "A theory of equity, reciprocity and competition," *American Economic Review*, 90(2000), 166-93.
- Bolton, Gary, Jordi Brandts, and Axel Ockenfels, "Measuring Motivations for the Reciprocal Responses Observed in a Simple Dilemma Game," *Experimental Economics*, 1(1998), 207-19.
- Brandts, Jordi, and Gary Charness, "Hot vs. Cold: Sequential Responses and Preference Stability in Experimental Games," *Experimental Economics*, 2(2000), 227-38.
- Buchan, Nancy, Rachel Croson, and Sara Solnick, "Trust and Gender: An Examination of Behavior, Biases, and Beliefs in the Investment Game," Working paper, The Wharton School, University of Pennsylvania, 2003.
- Camerer, Colin, *Behavioral Game Theory* (Princeton: Princeton University Press, 2003).
- Camerer, Colin, "Individual Decision Making," in: Kagel, John, and Alvin Roth (eds.). *The Handbook of Experimental Economics* (Princeton: Princeton University Press, 1995).
- Camerer, Colin F., and Ernst Fehr, "Measuring Social Norms and Preferences Using Experimental Games: A Guide for Social Scientists," Working paper No. 97, Institute for Empirical Economic Research, University of Zurich, 2002.
- Cardenas, Juan Camilo, and Jeffrey Carpenter, "Three Themes on Field Experiments and Economic Development," Working paper, Middlebury College, 2003.

- Carter, Michael R., and Marco Castillo, "The Economic Impacts of Altruism, Trust and Reciprocity: An Experimental Approach to Social Capital," Working paper, University of Wisconsin-Madison, 2002.
- Charness, Gary, "Attribution and Reciprocity in a Labor Market: An Experimental Investigation," Mimeo, University of California at Berkeley, 1996.
- Charness, Gary, and Uri Gneezy, "What's in a Name? Anonymity and Social Distance in Dictator and Ultimatum Games," Mimeo, 2000.
- Charness, Gary, and Matthew Rabin, "Understanding Social Preferences With Simple Tests," *Quarterly Journal of Economics*, 117(2002), 817–69.
- Costa-Gomez, Miguel A., and Georg Weizsäcker, "Stated Beliefs and Play in Normal-Form Games," mimeo, 2003.
- Cox, James C., "How To Identify Trust and Reciprocity," *Games and Economic Behavior*, forthcoming, 2003.
- Cox, James C., "Trust, Reciprocity, and Other-Regarding Preferences: Groups vs. Individuals and Males vs. Females," in : Zwick, Rami, and Amnon Rapoport (eds.). *Advances in Experimental Business Research* (Boston: Kluwer, 2002).
- Cox, James C., and Daniel Friedman, "A Tractable Model of Reciprocity and Fairness," Working paper, University of Arizona, 2002.
- Croson, Rachel, "Thinking Like a Game Theorist: Factors Affecting the Frequency of Equilibrium Play," *Journal of Economic Behavior and Organization*, 41(2000), 299-314.
- Croson, Rachel, and Nancy Buchan, "Gender and Culture: International Experimental Evidence from Trust Games," *American Economic Review*, 89(1999), 386-92.
- Dufwenberg, Martin, and Georg Kirchsteiger, "A theory of sequential reciprocity," Working paper 9837, Tilburg Center for Economic Research, 1998.
- Dufwenberg, Martin, and Uri Gneezy, "Measuring Beliefs in an Experimental Lost Wallet Game," *Games and Economic Behavior*, 30(2000), 163-82.
- Eckel, Catherine C., and Philip Grossman, "Are Women Less Selfish than Men? Evidence from Dictator Experiments," *Economic Journal*, 108(1998), 726-35.
- Eckel, Catherine C. and Rick K. Wilson, "Is Trust a Risky Decision?" *Journal of Economic Behavior and Organization*, forthcoming, 2004.
- Engle-Warnick, Jim, and Robert L. Slonim, "The Evolution of Strategies in a Repeated Trust Game," *Journal of Economic Behavior and Organization*, forthcoming, 2004.
- Ensminger, Jean, "Experimental Economics in the Bush: How Institutions Matter," in Menard, Claude (ed.), *Institutions and Organizations* (London: Edward Elgar, 2000).
- Falk, Armin, Ernst Fehr, and Urs Fischbacher, "Testing Theories of Fairness – Intentions Matter," Working paper No. 63, Institute for Empirical Economic Research, University of Zürich, 2000.
- Falk, Armin, and Urs Fischbacher, "A Theory of Reciprocity," Working paper No. 6, Institute for Empirical Research in Economics, University of Zürich, 1998.
- Fehr, Ernst, and Simon Gächter, "Fairness and Retaliation - The Economics of Reciprocity," *Journal of Economic Perspectives* 14(2000), 159-81.
- Fehr, Ernst and Simon Gächter. "Do Incentive Contracts Crowd Out Voluntary Cooperation?" Working paper, Institute for Empirical Economic Research in Economics, University of Zürich, 2003.
- Fehr, Ernst, and Klaus Schmidt, "A Theory of Fairness, Competition and Cooperation," *Quarterly Journal of Economics*, 114(1999), 817-68.

- Fehr, Ernst and Klaus Schmidt, "Theories of Fairness and Reciprocity -- Evidence and Economic Applications." In: Dewatripont, M., Hansen, L. and Turnovsky, St. (eds.), *Advances in Economics and Econometrics - 8th World Congress, Econometric Society Monographs* (Cambridge: Cambridge University Press, 2002).
- Fehr, Ernst, Urs Fischbacher, Bernhard von Rosenbladt, Jürgen Schupp and Gert G. Wagner, "A Nation-Wide Laboratory-Examining Trust and Trustworthiness by Integrating Behavioral Experiments into Representative Surveys," *Schmollers Jahrbuch*, 122 (2002), 519-42.
- Fershtman, Chaim, and Uri Gneezy, "Discrimination in a Segmented Society: An Experimental Approach," *Quarterly Journal of Economics*, CXVI(2001), 351-77.
- Frey, Bruno S., and Stephan Meier, "Pro-Social Behavior in a Natural Setting," *Journal of Economic Behavior and Organization*, forthcoming, 2004.
- Fukuyama, Francis, *Trust: Social Virtues and the Creation of Prosperity* (New York: Free Press, 1995).
- Glaeser, Edward L., David I. Laibson, Jose A. Scheinkman and Christine L. Soutter, "Measuring Trust," *Quarterly Journal of Economics*, CXV(2000), 811-46.
- Gambetta, Diego, "Can We Trust Trust?" in Gambetta, Diego (ed), *Trust: Making and Breaking Corporative Relations* (Oxford: Blackwell, 1988).
- Hardin, Russell, *Trust and Trustworthiness* (New York: Russell Sage, 2002).
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, Richard McElrath, Michael Alvard, Abigail Barr, Jean Ensminger, Kim Hill, Francisco Gil-White, Michael Gurven, Frank Marlowe, John Q. Patton, Natalie Smith and David Tracer, "Economic Man in Cross-cultural Perspective: Behavioral Experiments in 15 Small-scale Societies," Mimeo, Dept. of Anthropology, University of California Los Angeles, 2001.
- Inglehart, Ronald, "Trust, Well-being and Democracy," in: Warren, Mark E. (ed.), *Democracy and Trust* (Cambridge: Cambridge University Press, 1999, pp. 88-120).
- Kahneman, Daniel, Jack Knetsch and Richard Thaler, "Fairness as Constraint on Profit Seeking: Entitlements in the Market," *American Economic Review* 76(1986), 728-41.
- Knack, Stephen, and Philip Keefer, "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," *Quarterly Journal of Economics*, 112(1997), 1251-88.
- Koford, Kenneth, "An Experimental Test of the Degree of Trust in Bulgaria: Some Results and Some Conjectures," in *Economy and Development of Society: Varna University of Economics 80th Jubilee, Volume 2* (Varna Economics University Publishers, Varna, Bulgaria, 2001).
- Kramer, Roderick, "Trust and Distrust in Organizations: Emerging Perspectives, Enduring Questions," *Annual Review of Psychology*, 50(1999), 569-98.
- Kramer, Roderick, and Tom R. Tyler (eds.), *Trust in Organizations* (Thousand Oaks: Sage, 1996).
- LaPorta, Raphael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, "Trust in Large Organizations," *American Economic Review*, 87(1997), 333-38.
- Laury, Susan, "Pay One or Pay All: Random Selection of One Choice for Payment," Mimeo, Georgia State University, 2002.
- Mansbridge, Jenny, "Altruistic Trust," in: Warren, Mark E. (ed.), *Democracy and Trust* (Cambridge: Cambridge University Press, 1999, pp. 290-309).
- McCabe, Kevin, Mary Rigdon and Vernon Smith, "Positive Reciprocity and Intentions in Trust Games," *Journal of Economic Behavior and Organization*, 52(2003), 267-76.
- Ostrom, Elinor and James Walker (eds.), *Trust and Reciprocity* (New York: Russell Sage, 2003).

- Ortmann, Andreas, John Fitzgerald and Carl Boeing, "Trust, Reciprocity, and Social History: A Re-examination," *Experimental Economics*, 3(2000), 81-100.
- Putnam, Robert D., "Bowling Alone," *Journal of Democracy*, 6(1995), 65-78.
- Putnam, Robert D., *Bowling Alone. The Collapse and Revival of American Community* (New York: Simon & Schuster, 2000).
- Putnam, Robert D., Robert Leonardi and Raffaella Y. Nanetti, *Making democracy work: Civic traditions in modern Italy* (Princeton: Princeton University Press, 1993).
- Rabin, Matthew, "Incorporating Fairness into Game Theory and Economics," *American Economic Review*, 83(1993), 1281-1302.
- Rabin, Matthew, "Risk Aversion and Expected-Utility Theory: A Calibration Theorem," *Econometrica*, 68(2000), 1281-92.
- Robinson, Robert and Elton Jackson, "Is Trust in Others Declining in America? An Age-Period-Cohort Analysis," *Social Science Research*, 30(2001), 117-45.
- Roth, Alvin E., "Bargaining Experiments," in Kagel, John E. and Alvin E. Roth (eds.), *Handbook of Experimental Economics* (Princeton: Princeton University Press, 1995, pp. 253-348.).
- Roth, Alvin E., Vesna Prasnikar, Masahiro Okuno-Fujiwara and Shmuel Zamir, "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study," *American Economic Review*, 81(1991), 1068-95.
- Schechter, Laura, "Traditional Trust Measurement and the Risk Confound: An Experiment in Rural Paraguay," Working paper, University of California at Berkeley, 2003.
- Slemrod, Joel and Peter Katuscak, "Do Trust and Trustworthiness Pay Off?" NBER Working Papers 9200, National Bureau of Economic Research, 2002.
- Smith, Adam, *The Theory of Moral Sentiments*, 1791, edited by D.D. Raphael and A.L. Macfie (Indianapolis: Liberty Fund, 1984)
- Smith, Tom, "Factors Relating to Misanthropy in Contemporary American Society," *Social Science Research*, 26(1997), 170-96.
- Willinger, Mark, Claudia Keser, Christopher Lohmann and Jean-Claude Usunier, "A Comparison of Trust and Reciprocity Between France and Germany: Experimental Investigation Based on the Investment Game," *Journal of Economic Psychology*, forthcoming, 2003.
- Yamagishi, Toshi and Midori Yamagishi, "Trust and commitment in the United States and Japan." *Motivation and Emotion*, 18(1994), 129-66.
- Zack, Paul and Steven Knack, "Trust and Growth," *Economic Journal*, 111(2001), 295-321.

Appendix

Table A.1: Variable definitions

Concept	Variable Name	Variable Description	Range of values
Trust behavior	Send Trust	Amount trustor sends in Trust Game	0 to 100CU
Trustworthiness behavior	Percent remitted	Amount trustee returns, as a proportion of amount received	0 to 1
Warm-glow kindness for Trust	TDGgive	Amount subject sends in Triple Dictator Game	0 to 100CU
Warm-glow kindness for Trustworthiness	DGgive	Amount subject sends in Dictator Game	0 to 100CU
Social preferences for Trustworthiness	Predicted remit	Distributional preference subject exhibits in Dictator Game	0 to 1
Expectations of return	Prop. expected back	Amount trustor expects back, as a proportion of amount sent by trustor	0 to 1
Reciprocity	Received	Amount trustee receives in Trust Game, equals "Send Trust" * 3	0 to 300CU
Attitude to risk	Risk aversion	Number of risky gambles rejected in favor of sure thing by subject	0 to 6
Order effect	Dictator 1 st	Whether the subject played the dictator game prior to the trust game	0 = No, 1 = Yes
South Africa	South Africa	Whether the subject participated in the experiment in South Africa	0 = No, 1 = Yes
Russia	Russia	Whether the subject participated in the experiment in Russia	0 = No, 1 = Yes
Race	Race	Whether the subject is non-white	0 = White, 1 = Non-white
Race in US	US non-white	Whether the subject is a non-white person in the US	0 = No, 1 = Yes
Race in SA	SA non-white	Whether the subject is a non-white person in South Africa	0 = No, 1 = Yes
Gender	Gender	Gender of the subject	0 = female, 1 = male
Age	Age group	Age of the subject	1 to 6 (1 = "Under 20", 6 = "Over 60")
Economic situation	Economic situation	Economic well-being of the subject	1 to 6 (1 = "Poor", 6 = "Wealthy")
Education	Economics major	Whether the subject majors in economics	0 = No, 1 = Yes
Organizational membership	# of organizations	Number of organizations the subject belongs to	Integer value
Trust attitude towards strangers	Trust strangers	"Generally speaking, which of the following people do you feel you could trust not to cheat you?"	1 – if subject trusts one of the following: members of one's religion, citizens of one's country, or foreigners. 0 – if subject does not trust any of the above groups

Table A.2a: Summary statistics

	ALL Mean (std. dev.) {N}	WHITE Mean (std. dev.) {N}	NON-WHITE Mean (std. dev.) {N}	MALE Mean (std. dev.) {N}	FEMALE Mean (std. dev.) {N}
Send Trust (CU)	44.50 (32.90) {179}	48.07 (33.08) {127}	35.77 (31.08) {52}	47.19 (33.83) {96}	41.39 (31.71) {83}
DGgive (CU)	25.18 (20.30) {359}	26.21 (20.01) {243}	23.02 (20.80) {116}	24.14 (19.82) {200}	26.66 (20.83) {158}
TDGgive (CU)	24.31 (20.70) {358}	25.21 (21.19) {243}	22.42 (19.57) {115}	25.93 (22.70) {199}	22.28 (20.83) {158}
Percent remitted (% of 3X)	26.67 (18.33) {1790}	27.66 (19) {1150}	25 (17) {640}	27.33 (16.67) {1050}	25.67 (16.67) {740}
Prop. expected back if sent positive amount (% of 3x)	30.51 (20.21) {159}	31.68 (19.27) {114}	27.42 (22.36) {45}	30.75 (19.91) {86}	30.23 (20.69) {73}
Prop. expected back if sent 0 or positive amount (% of 3x)	27.72 (21.18) {175}	28.89 (20.49) {125}	24.79 (22.77) {50}	28.13 (20.90) {94}	27.24 (21.62) {81}
Risk aversion (1-6)	3.74 (1.35) {321}	3.90 (1.34) {102}	3.90 (1.34) {102}	3.52 (1.34) {176}	4.0 (1.32) {145}
Dictator 1 st	0.49 (0.50) {359}	0.53 (0.50) {243}	0.41 (0.49) {116}	0.46 (0.50) {201}	0.53 (0.50) {158}
Race (% non-white)	32 (47) {359}	0 (0) {243}	100 (0) {116}	23.38 (42.43) {201}	43.67 (49.76) {158}
Gender (% male)	56 (50) {358}	63.37 (48.28) {243}	40 (49.2) {115}	100 (0) {200}	0 (0) {158}
Age group (1-5)	1.61 (0.59) {357}	1.56 (0.61) {241}	1.72 (0.56) {116}	1.61 (0.56) {200}	1.62 (0.64) {157}
Economic situation (1-6)	3.26 (1.04) {356}	3.23 (1.04) {242}	3.33 (1.04) {114}	3.17 (1.02) {198}	3.38 (1.06) {158}
Economics major (% yes)	24.5 (43.08) {359}	20.99 (40.81) {243}	32.76 (47.14) {116}	15.92 (36.68) {201}	36.08 (48.17) {158}
# of organizations	1.93 (1.42) {358}	1.79 (1.37) {242}	2.22 (1.49) {116}	1.81 (1.46) {200}	2.08 (1.35) {158}
Trust strangers (% yes if trust citizens, same religion and foreigners)	20.01 (40.10) {359}	19.75 (39.89) {243}	20.69 (40.68) {116}	17.41 (38.02) {201}	23.42 (42.48) {158}

Table A.2b: Summary statistics

	RUSSIA Mean (s.d.) {N}	SOUTH AFRICA Mean (s.d.) {N}	UNITED STATES Mean (s.d.) {N}	SA: WHITE Mean (s.d.) {N}	SA: NON- WHITE Mean (s.d.) {N}	US: WHITE Mean (s.d.) {N}	US: NON- WHITE Mean (s.d.) {N}
Send Trust (CU)	49.15 (33.64) {59}	42.81 (32.54) {64}	41.51 (32.58) {56}	52.18 (32.69) {32}	33.43 (30.01) {32}	42.63 (32.67) {36}	39.5 (33.16) {20}
DGgive (CU)	26.06 (19.87) {118}	25.22 (19.64) {129}	24.21 (21.58) {112}	25.5 (18.87) {58}	24.98 (18.87) {58}	27.08 (21.42) {67}	19.93 (21.33) {45}
TDGgive (CU)	24.69 (20.01) {118}	27.43 (22.241) {128}	20.36 (19.04) {112}	29.71 (24.71) {58}	25.53 (24.71) {58}	22.22 (19.53) {67}	17.57 (18.12) {45}
Percent remitted (% of 3X)	29.33 (21.33) {590}	27 (16.67) {640}	23.33 (16.67) {560}	28.67 (16.33) {250}	26 (16.33) {390}	23.33 (15.33) {310}	23.33 (17.33) {250}
Prop. expected back if sent positive amount (% of 3x)	33.14 (19.44) {52}	31.47 (20.32) {56}	26.78 (20.70) {51}	33.50 (16.80) {29}	29.29 (23.67) {27}	27.79 (20.99) {33}	24.92 (20.61) {18}
Prop. expected back if sent 0 or positive amount (% of 3x)	30.23 (20.82) {57}	28.43 (21.46) {62}	24.39 (21.19) {56}	30.36 (18.80) {32}	26.37 (24.13) {30}	25.47 (21.53) {36}	22.43 (20.95) {20}
Risk aversion (1-6)	3.67 (1.41) {104}	3.54 (1.34) {108}	4.01 (1.27) {109}	3.32 (1.33) {50}	3.72 (1.32) {58}	3.92 (1.21) {65}	4.13 (1.33) {44}
Dictator 1 st	0.49 (0.50) {118}	0.48 (0.50) {128}	0.50 (0.50) {112}	0.53 (0.50) {58}	0.44 (0.50) {71}	0.58 (0.50) {67}	0.38 (0.49) {45}
Race (% non-white)	0 (0) {118}	55.04 (49.94) {129}	40.18 (49.25) {112}	0 (0) {58}	100 (0) {71}	0 (0) {67}	100 (0) {45}
Gender (% male)	83.05 (37.68) {118}	45.74 (50.01) {129}	38.74 (48.94) {111}	56.90 (49.95) {58}	36.62 (48.52) {71}	34.33 (47.84) {67}	45.45 (50.37) {44}
Age group (1-5)	1.40 (0.49) {116}	1.64 (0.50) {129}	1.81 (0.72) {112}	1.59 (0.50) {58}	1.68 (0.50) {71}	1.84 (0.77) {67}	1.78 (0.64) {45}
Economic situation (1-6)	2.86 (0.77) {118}	3.78 (0.99) {127}	3.08 (1.11) {111}	4.24 (0.85) {58}	3.40 (0.93) {69}	2.98 (1.06) {66}	3.22 (1.18) {45}
Economics major (%)	1.69 (0.12) {118}	51.16 (50.18) {129}	18.75 (39.21) {112}	55.17 (50.17) {58}	47.89 (50.31) {71}	25.37 (43.84) {67}	8.89 (28.78) {45}
# of organizations	1.58 (1.29) {118}	2.02 (1.37) {129}	2.20 (1.54) {111}	1.78 (1.16) {58}	2.21 (1.50) {71}	2.17 (1.59) {66}	2.24 (1.48) {45}
Trust strangers (attitude)	13.56 (34.38) {118}	24.81 (43.36) {129}	21.43 (41.22) {112}	29.31 (45.92) {58}	21.13 (41.11) {71}	22.39 (42.0) {67}	20.0 (40.45) {45}

A.3: Correlations

	Send in Trust	DGgive	TDGgive	Proportion expected back	Risk aversion	Dictator 1 st	South Africa
Send in Trust	1						
DGgive	0.3482	1					
TDGgive	0.3893	0.3453	1				
Prop. expected back	0.6044	0.2152	0.1901	1			
Risk aversion	-0.1282	-0.004	-0.0028	-0.0295	1		
Dictator 1 st	-0.2158	-0.0381	-0.0377	-0.1333	0.0555	1	
South Africa	-0.0467	-0.1129	0.0869	0.0022	-0.0283	-0.0686	1
Russia	0.1385	0.0382	-0.0432	0.1225	-0.1186	0.0227	
Trust strangers	0.0762	0.0814	0.0889	0.0959	0.0792	-0.1226	0.1907
# of organizations	-0.1452	0.1162	-0.0855	-0.0481	0.0931	0.0552	0.1001
Gender (1=male)	0.0343	-0.0777	0.1348	0.0251	-0.1901	-0.0842	0.0472
US non-white	-0.0515	0.0026	-0.1078	-0.0783	0.113	-0.1173	
SA non-white	-0.2373	-0.1187	-0.1055	-0.1215	0.103	-0.0649	0.5731
Economic situation (1-6)	-0.0398	-0.0968	0.0044	0.0016	-0.0738	0.0508	0.4392
Age Group (1-6)	0.0243	0.0549	0.0959	-0.0235	-0.0286	-0.0536	-0.0715
Economics major	-0.0325	-0.0362	0.0072	0.0653	-0.0037	0.0739	0.4374
Percent remitted (Y/3X)		0.3480	0.2608		-0.0898	-0.0385	0.0254
	Russia	Trust strangers	# of organizations	Gender (1=male)	US non-white	SA non-white	Economic situation(1-6)
Russia	1						
Trust strangers	-0.2002	1					
# of organizations	-0.1748	0.2452	1				
Gender (1=male)	0.334	-0.154	-0.163	1			
US non-white		-0.0072	0.0932	-0.1725	1		
SA non-white		0.0278	0.1431	-0.0815		1	
Economic situation (1-6)	-0.308	0.0108	0.0205	-0.0561	-0.0143	-0.0047	1
Age Group (1-6)	-0.321	0.1623	0.0705	-0.042	0.1633	-0.0403	-0.1993
Economics major	-0.3318	0.2399	0.0472	-0.1819	-0.2054	0.2361	0.1466
Percent remitted (Y/3X)	0.0811	0.1666	0.0034	0.0365	-0.0640	-0.0061	0.0261
	Age Group (1-6)	Economics major					
Age Group (1-6)	1						
Economics major	-0.0787	1					
Percent remitted (Y/3X)	-0.0289	0.0396	1				

Table A.4: Trust: Amount sent in trust game, by subgroups.

	(1) Men	(2) Women	(3) White	(4) Non-white	(5) Russia	(6) US	(7) South Africa
Prop. expected back	79.264 (13.979)***	118.209 (12.057)***	106.129 (11.708)***	92.559 (15.017)**	101.745 (20.404)***	106.299 (14.496)***	96.589 (14.949)***
TDGgive	0.537 (0.120)***	0.121 (0.166)	0.385 (0.112)***	0.544 (0.193)**	0.412 (0.287)	0.476 (0.164)***	0.380 (0.123)***
Risk aversion	-2.172 (1.432)	0.137 (1.670)	-1.058 (1.284)	-2.613 (1.830)	-1.348 (2.304)	0.276 (2.205)	-2.132 (1.560)
Dictator 1 st (yes=1)	-9.289 (5.024)*	-2.321 (4.999)	-4.940 (4.313)	-13.867 (5.751)*	-13.049 (7.232)*	0.320 (6.700)	-5.778 (5.634)
South Africa	21.938 (10.290)**	-2.329 (8.035)	9.941 (6.942)	-9.563 (6.036)			
Russia	6.313 (7.360)	6.284 (8.313)	-1.088 (5.746)				
US non-white	0.571 (11.084)	-3.935 (7.518)				4.727 (6.205)	
SA non-white	-22.271 (9.289)**	-6.829 (8.538)					-16.258 (5.947)***
Gender (1=male)			-3.884 (4.583)	-10.511 (6.084)	-1.520 (10.223)	-5.788 (6.893)	1.569 (5.238)
Age Group (1- 6)	0.917 (4.364)	-1.632 (3.801)	-4.887 (3.289)	13.746 (5.335)*	-2.437 (7.568)	-1.540 (4.152)	-1.978 (5.417)
Economic situation (1-6)	-7.547 (3.300)**	-2.742 (2.378)	-5.962 (2.390)**	5.904 (3.050)	-1.077 (6.182)	-2.121 (2.857)	-4.864 (3.145)
Economics major	-9.771 (7.258)	0.883 (5.925)	-6.695 (5.715)	6.171 (6.933)	19.327 (19.804)	-1.076 (7.994)	-11.419 (5.716)*
# of organizations	-0.632 (1.969)	-0.475 (1.832)	-0.478 (1.597)	-2.202 (2.197)	-4.447 (3.295)	-3.302 (2.112)	4.542 (2.173)**
Trust strangers	8.124 (7.009)	-7.084 (6.453)	-2.259 (5.591)	5.271 (8.121)	14.735 (13.911)	-5.678 (7.778)	1.721 (6.582)
Constant	38.090 (16.545)**	26.437 (15.700)*	44.996 (14.338)***	-13.883 (19.582)	33.953 (28.819)	21.434 (18.211)	41.004 (19.537)**
Observations	89	79	122	46	54	56	58
R-squared	0.67	0.66	0.62	0.72	0.57	0.71	0.72
Adjusted R- squared	0.62	0.59	0.58	0.63	0.47	0.63	0.65

The dependent variable is X, the amount sent in the trust game. Standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table A.5. Trustworthiness: Percentage returned in the trust game, by subgroup, using DGgive.

	(1) Men	(2) Women	(3) White	(4) Non-white	(5) Russia	(6) US	(7) South Africa
Received (3X)	0.0005 (0.0001)***	0.0005 (0.0001)***	0.0006 (0.0001)***	0.0004 (0.0001)***	0.0006 (0.0001)***	0.0007 (0.0001)***	0.0003 (0.0001)***
DGgive	0.004 (0.001)***	0.003 (0.001)***	0.004 (0.001)***	0.002 (0.001)**	0.005 (0.001)***	0.001 (0.001)	0.003 (0.001)***
Risk aversion	-0.025 (0.010)**	0.018 (0.011)*	-0.013 (0.010)	-0.005 (0.013)	-0.020 (0.013)	-0.012 (0.015)	0.002 (0.013)
Dictator 1st (yes=1)	-0.012 (0.028)	-0.000 (0.039)	-0.029 (0.027)	-0.009 (0.040)	-0.040 (0.038)	0.005 (0.043)	-0.037 (0.034)
South Africa	0.020 (0.042)	0.038 (0.053)	0.008 (0.038)	-0.011 (0.035)			
Russia	0.096 (0.034)***	-0.014 (0.057)	0.073 (0.033)**				
US non-white	0.087 (0.044)*	0.009 (0.051)				0.031 (0.035)	
SA non-white	-0.018 (0.061)	0.007 (0.049)					-0.040 (0.042)
Gender (1=male)			-0.002 (0.029)	-0.019 (0.043)	0.041 (0.046)	-0.012 (0.033)	-0.015 (0.036)
Age Group (1-6)	0.003 (0.026)	0.015 (0.025)	0.020 (0.023)	-0.024 (0.033)	0.005 (0.038)	-0.008 (0.031)	0.009 (0.034)
Economic situation (1-6)	0.005 (0.015)	0.017 (0.021)	0.016 (0.014)	-0.009 (0.018)	0.001 (0.021)	-0.000 (0.016)	0.004 (0.025)
Economics major	0.050 (0.046)	-0.015 (0.038)	0.040 (0.039)	0.007 (0.048)	0.000 (0.000)	0.064 (0.050)	0.009 (0.038)
# of organizations	-0.013 (0.009)	0.018 (0.011)*	0.001 (0.009)	-0.005 (0.013)	-0.009 (0.014)	-0.001 (0.009)	0.004 (0.014)
Trust strangers	0.062 (0.035)*	0.032 (0.035)	0.057 (0.033)*	0.056 (0.039)	0.026 (0.062)	0.062 (0.038)	0.037 (0.038)
Constant	0.112 (0.085)	-0.117 (0.115)	-0.004 (0.094)	0.235 (0.115)**	0.121 (0.134)	0.124 (0.115)	0.130 (0.145)
Observations	1030	740	1140	630	590	540	640
R-squared	0.30	0.26	0.31	0.15	0.35	0.22	0.19
Adjusted R-squared	0.29	0.25	0.30	0.14	0.34	0.20	0.17

The dependent variable is Y/3X, the amount returned divided by the amount received.

Standard errors in parentheses; observations are clustered by individual.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table A.6. Trustworthiness: Percentage returned in the trust game, by subgroup, using predicted remit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Men	Women	White	Non-white	Russia	US	South Africa
Received (3X)	0.00009 (0.00011)	0.00013 (0.00014)	0.00007 (0.00012)	0.00011 (0.00014)	-0.00005 (0.00016)	0.00049 (0.00014)***	-0.00009 (0.00016)
Predicted remit	0.466 (0.098)***	0.335 (0.083)***	0.482 (0.084)***	0.310 (0.099)***	0.623 (0.130)***	0.215 (0.089)**	0.361 (0.106)***
Risk aversion	-0.023 (0.011)**	0.018 (0.011)	-0.011 (0.011)	-0.004 (0.013)	-0.015 (0.014)	-0.011 (0.015)	0.003 (0.014)
Dictator 1st (yes=1)	-0.008 (0.029)	-0.012 (0.039)	-0.024 (0.028)	-0.012 (0.038)	-0.023 (0.039)	0.003 (0.042)	-0.040 (0.035)
South Africa	0.026 (0.044)	0.043 (0.054)	0.007 (0.037)	-0.005 (0.034)			
Russia	0.093 (0.034)***	-0.007 (0.061)	0.071 (0.033)**				
US non-white	0.067 (0.041)	0.006 (0.050)				0.028 (0.035)	
SA non-white	-0.028 (0.060)	0.005 (0.050)					-0.042 (0.042)
Gender (1=male)			0.005 (0.030)	-0.023 (0.042)	0.047 (0.049)	-0.012 (0.033)	-0.019 (0.037)
Age Group (1-6)	0.005 (0.026)	0.012 (0.025)	0.018 (0.024)	-0.022 (0.032)	0.006 (0.040)	-0.009 (0.030)	0.015 (0.034)
Economic situation (1-6)	0.007 (0.015)	0.014 (0.021)	0.016 (0.014)	-0.008 (0.018)	0.006 (0.022)	-0.001 (0.016)	0.005 (0.024)
Economics major	0.048 (0.048)	-0.011 (0.039)	0.051 (0.039)	0.003 (0.049)	0.000 (0.000)	0.066 (0.049)	0.008 (0.040)
# of organizations	-0.011 (0.009)	0.017 (0.011)	0.002 (0.009)	-0.004 (0.012)	-0.004 (0.015)	-0.000 (0.009)	0.003 (0.014)
Trust strangers	0.069 (0.035)**	0.035 (0.036)	0.070 (0.032)**	0.051 (0.039)	0.050 (0.059)	0.066 (0.038)*	0.030 (0.038)
Constant	0.201 (0.080)**	-0.004 (0.115)	0.106 (0.097)	0.289 (0.110)**	0.221 (0.139)	0.163 (0.108)	0.223 (0.143)
Observations	1030	740	1140	630	590	540	640
R-squared	0.29	0.23	0.27	0.16	0.32	0.23	0.17
Adjusted R-squared	0.28	0.22	0.27	0.15	0.31	0.21	0.15

The dependent variable is Y/3X, the amount returned divided by the amount received.

Standard errors in parentheses; observations are clustered by individual.

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure A.1: Trust game choices by gender

