

**John F. Kennedy School of Government
Harvard University
Faculty Research Working Papers Series**

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Nov 2003

RWP03-047

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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 experiments run in Russia, South Africa and the United States, we find that only about one third of the subjects who trust expect to make money and that reciprocity matters in the United States but hardly in Russia and South Africa. While there is substantial heterogeneity in motivation, on average, trust and trustworthiness behavior is significantly related to warm-glow kindness. Taking such intrinsic benefits into account, even one-shot trust appears to "pay."

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

* We thank Jeffrey Carpenter, Gary Chamberlain, Simon Gächter, Ed Glaeser, Uri Gneezy, Caroline Hoxby, Larry Katz, David Laibson, Felix Oberholzer-Gee, Jonah Rockoff, Jesse Shapiro, Jeremy Tobacman, Richard Zeckhauser and the participants of seminars at Harvard and the 2002 Economic Science Association meetings for their helpful comments, and Justine Burns and Malcolm Kesswell for their help in running the experiments at Cape Town University. 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.

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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 him-/herself vulnerable, i.e. takes a course of action creating incentives for the other party, the trustee, to exploit him/her. 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 or she 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., Yamagishi and Yamagishi 1994, Gambetta 1988, Hardin 2002, Camerer 2003).¹ 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).²

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. Unconditional kindness could be due to social preferences such as

¹ Our earlier work on trust made the same assumption, see Bohnet, Frey and Huck (2001). While the trust research in other disciplines has also focused on expectation-based trust, the possibility of "altruistic trust" has been noted by Mansbridge (1999) and Kramer (1999: 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."

² 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 (1999), 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 2001). Dufwenberg and Gneezy (2000) and Cox (2003) question its relevance for trustworthiness.

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 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 (even though some trustees honored trust), 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 (i.e. the negative returns on many trustors’ investments), 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.

³ See, e.g., Andreoni (1990) who 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.

This number is surprisingly close to our results: Only 33 percent of the 154 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 they (correctly) expect that it does not “pay” in one-shot interactions? We focus on single-play anonymous interactions. While excluding important contextual features that may affect trust and trustworthiness in real life, 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 if the game is played repeatedly (e.g., Bohnet and Huck 2003, Engle-Warnick and Slonim 2003).

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 measure their attitudes to risk. While our primary goal is to account for the *heterogeneity in trust and trustworthiness behavior*, we are also interested in whether there is *heterogeneity in the motives* accounting for observed behavior. We thus 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. To connect our research with earlier studies on trust, we also confront 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?”⁵

Our study is related to two 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 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 (2003) found betrayal costs to be an important factor in trust decisions.

⁵ 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 include the following question: "Generally speaking, which of the following people do you feel you could trust not to cheat you? (please check all that apply)
members of your family your friends your colleagues members of your religion your neighbors citizens of your country foreigners

⁶ "Many people think within-subject analysis is the only proper analysis in choice experiments, because EU 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)

While not the focus of this paper, our investigation is also related to studies examining the relationship between attitudes to risk and trust decisions. Eckel and Wilson (2003) found no relationship between risk-taking and trust behavior.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 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 important 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, especially in the long run (Bohnet et al. 2001, Henrich et al. 2001, Fehr and Gächter 2003).

⁷ Note that the instruments used to measure risk preferences were quite removed from the trust decisions (e.g., involving gambles with different distributions of payoffs and, most notably, as Bohnet and Zeckhauser 2003 note, no second mover),

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

Policy makers should also be interested in 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 are less trusting but more trustworthy than men. Koford (2001) found that Bulgarian students were more trusting and trustworthy than the American subjects in Berg et al. (1995). Willinger, Keser, Lohmann and Usunier (2003) reported that the French trust less than the Germans but that there is 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.

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.

sample of Germans, Fehr, Fischbacher, Rosenbladt, Schupp and Wagner (2002) find 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).

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. 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

¹⁰ The experimental instructions can be found on www.ksg.harvard.edu/faculty/iris_bohnet

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.

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 half of our sessions, we changed the order in which the games were played. These subjects were confronted with the trust game first before participating in the dictator games.

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 \$300 or nothing or to accept a certain amount that varied between 60CU and 160CU 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

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.

and S=400 Rands in South Africa.¹⁵ 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 amount how much they would return. 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 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 in three countries: 118 students from universities in Moscow, Russia,¹⁷ 129 students from universities in Capetown, South Africa, and 112 students from colleges in the greater Boston area, 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.

¹⁴ For a similar approach to measuring the relevance of attitudes to risk for trust decisions, see Eckel and Wilson (2003). They found that risk preferences and trust decisions are not related.

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.

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.

III. Analytical Framework

Trust is defined as the amount sent, X , and trustworthiness as the amount returned divided by the amount received, that is $Y/3X$.¹⁹ 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 first hypotheses thus are:

H_1 for trust: $X = \alpha + \beta * E(Y/3X) + \gamma * \text{controls}$;

H_1 for trustworthiness: $Y/3X = \alpha + \beta * 3X + \gamma * \text{controls}$.

We take it as an indicator of reciprocity if the percent returned, $Y/3X$, increases with the amount received, $3X$. Expectations of the fraction returned may be rational, too pessimistic or too optimistic. 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 given country.

Alternatively, trust and trustworthiness may not depend on what one's counterpart does or is expected to do. Rather, they may depend on the utility a person derives from being kind and giving money to another person. Our second set of hypotheses thus are:

H_2 for trust: $X = \alpha + \beta * TDGgive + \gamma * \text{controls}$;

H_2 for trustworthiness: $Y/3X = \alpha + \beta * DGgive + \gamma * \text{controls}$,

¹⁹ Table A.1 in the appendix provides the specific definitions of all our variables.

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' preferences profiles.

Andreoni and Miller (2002), for example, found evidence for the existence of at least three different types in dictator games. They systematically examined how dictators respond to the price of giving in a series of dictator games.²⁰ 22 percent of the subjects responded to a decrease in the price of sending money to a recipient by substituting own earnings with other earnings (suggesting a Cobb-Douglas utility function). 30 percent kept the ratio between own and other's earnings constant (suggesting a Leontieff utility function).²¹ Most of Andreoni and Miller's (2002) subjects (47%) could best be characterized by a "weak selfish profile" where people send virtually nothing in the most expensive treatment but respond to the relative price of giving by increasing the amount sent.

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

²⁰ Andreoni and Vesterlund (2001) investigated the same question specifically for men and women and found that men were more sensitive to the price of giving than women.

²¹ In the Cobb-Douglas case, subjects would never send less in the TDG than in the DG. In contrast, fixed distributional preferences in the Leontieff case imply that dictators send less to their recipients in the TDG than in the DG. Selfish players do not send anything in either case.

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 TDGgive≠25CU	
14%	16%	15%	24%	31%

14 percent of our subjects are selfish and do not send anything in either game. 39 percent send less in the TDG than in DG, trying to preserve whatever distributional preference they exhibited in the DG (for example, by sending 50CU in the DG and 25CU in the TDG). If we add these two groups, the fraction of subjects with (approx.) fixed distributional preferences comprises 53 percent of our sample. 31 percent respond to the decrease in the price of giving in the TDG by sending more in the TDG than in the DG.

While we prefer not to impose one preference profile on all our subjects,²² we acknowledge that warm-glow kindness may seem like a relatively crude assumption for trustworthiness. It is unclear how 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 thus 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.²³ The latter 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.

²² For a different approach, see Carter and Castillo (2002).

²³ Fixed distributional preferences are also compatible with inequity aversion, see Fehr and Schmidt (1999) and Bolton and Ockenfels (2000).

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 $3X$ 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:

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

We do not perform an analogous analysis for the trustors—trying to predict the amount they should send based purely on their distributional preferences. The task of a trustor who wishes to distribute money according to some distributional rule is much more complex than that of a trustee, since he needs to consider the potential actions of a trustee for every amount sent. We believe that subjects are not capable of performing such calculations within the amount of time available.

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.²⁴ 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 on the various 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 do not suggest large differences in average behavior between our demographics subgroups in the three games. A Mann-Whitney and a Kolmogorov-Smirnov test reveal no significant differences in the means and the distributions of choices of

²⁴ We cluster the data by individuals in the regressions.

men and women²⁵ 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 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.²⁶

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

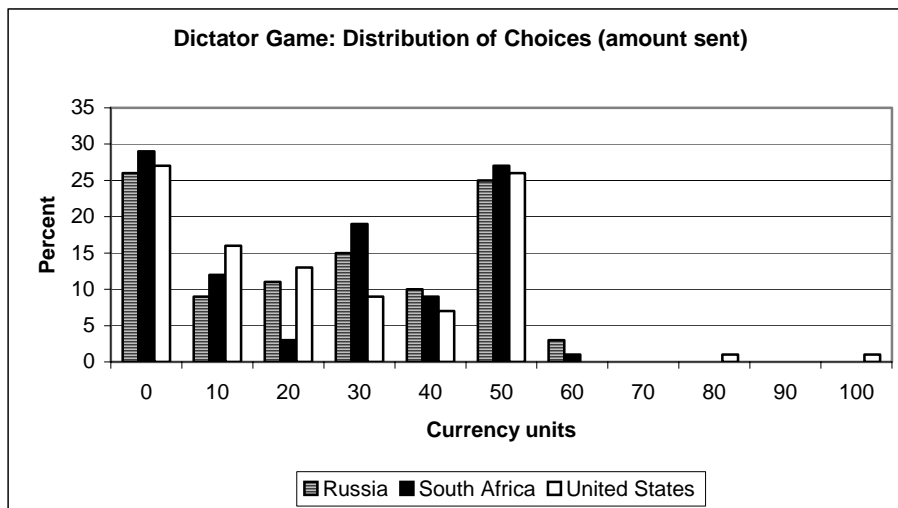


Figure 1a: Dictator game choices.

²⁵ 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.

²⁶ The difference in trust behavior between whites and nonwhites is mirrored by a similar difference in trust attitudes. 33% nonwhites and 53% whites report that they are willing to “generally trust others”. The race gap of about 20 percentage points applies to both South Africa and the United States. At the same time, the summary statistics suggest a difference in trust attitudes between South Africa and the United States (and Russia) more generally. The fraction of people who indicate that they trust others is 36 percent in South Africa, 56 percent in the US and 49 percent in Russia. This suggests that attitudes differ more strongly between countries than behavior, at least among college students. A more parsimonious test of this hypothesis would have to include other groups of subjects and compare attitudinal and behavioral differences of representative samples in various countries.

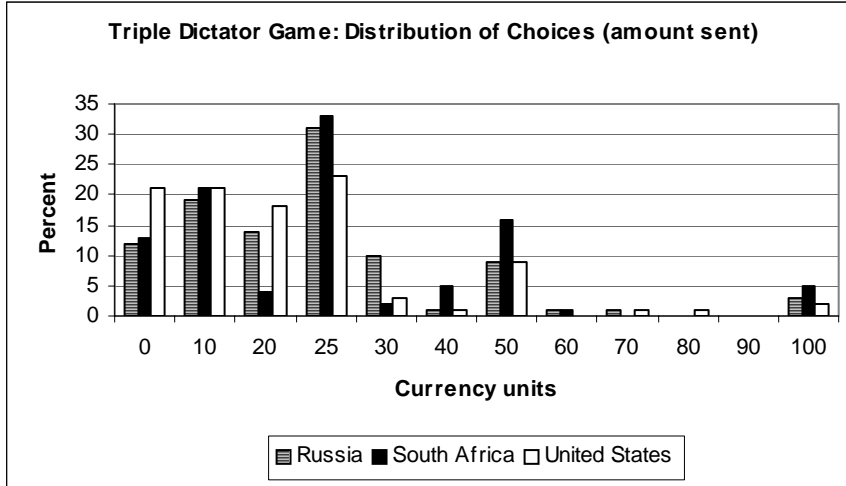


Figure 1b: Triple dictator game choices.

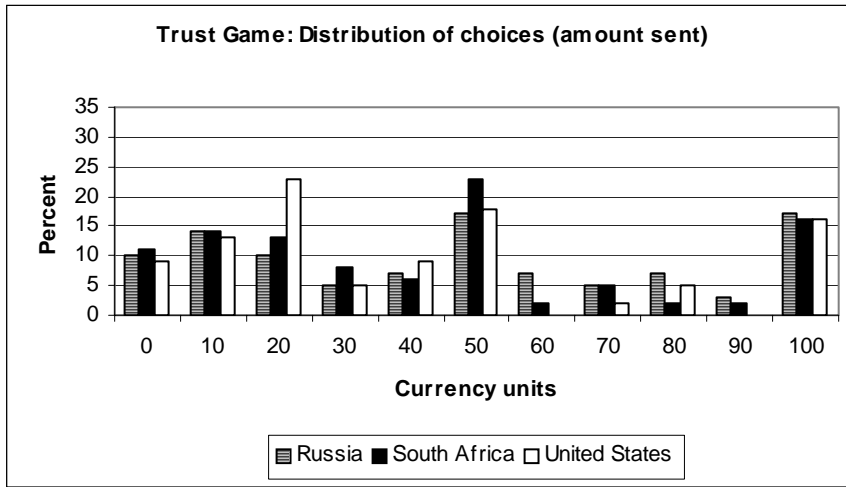


Figure 1c: Trust game choices - trustors.



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 (but possibly for 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?

154 of our 175 trustors²⁷ send a positive amount to their trustees. Out of those who trust, 34% expect to get back less than they sent, 33% expect to break even and 33% expect back more than they sent. A large majority of trusting subjects thus does not expect to make any money in this game. Looking at these three groups more closely reveals the following pattern: Most of those who send little expect back less than they sent and most of those who send a lot expect back more than they sent (see Table 2).

Table 2: Relationship between expectations of amount returned and amount sent.

Sent \ Expect back	X={10,...,30CU} (N=59)	X={40,...,60CU} (N=53)	X={70,...,90CU} (N=15)	X=100CU (N=27)
E(Y)<X	0.71	0.23	0.27	0
E(Y)=X	0.17	0.49	0.07	0.11
E(Y)>X	0.12	0.28	0.66	0.89

Table 3 shows the average amounts expected back for each possible amount sent. As before, expectations are generally smaller than the amounts sent for small amounts and larger

²⁷ 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.

for big 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. In the US, trustors are slightly more pessimistic about the amounts returned for small amounts sent than in Russia or South Africa. For amounts between sent 10CU and 30CU, Russians 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, $p < 0.01$).

Table 3: 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	Returned	Amount Expected	Returned	Amount Expected	Returned	Amount Expected	Returned
0	0 {16}	0 {177}	0 {5}	0 {59}	0 {6}	0 {64}	0 {5}	0 {54}
10	6.50 (9.21) {22}	5.89 (5.73) {177}	9.71 (11.35) {7}	6.21 (6.44) {59}	6.88 (9.98) {8}	6.94 (5.38) {64}	2.86 (4.88) {7}	4.28 (5.01) {54}
20	7.50 (9.51) {26}	11.55 (10.93) {177}	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}	8.26 (9.35) {54}
30	22.27 (12.72) {11}	20.63 (16.02) {177}	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}	16.04 (13.17) {54}
40	34.81 (17.33) {13}	29.84 (20.41) {177}	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}	25.48 (17.75) {54}
50	49.26 (21.53) {34}	42.61 (25.65) {177}	38.89 (22.05) {9}	46.53 (28.75) {59}	51.67 (19.40) {15}	43.45 (24.75) {64}	55.00 (22.97) {10}	37.33 (22.47) {54}
60	64.17 (24.17) {6}	52.08 (30.76) {177}	75.00 (17.32) {4}	57.60 (35.88) {59}	42.50 (24.75) {2}	50.44 (27.71) {64}	- (-) {0}	47.98 (27.69) {54}
70	63.33 (32.51) {6}	61.19 (37.54) {177}	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}	55.02 (32.59) {54}
80	103.75 (13.94) {6}	72.68 (42.84) {177}	100.00 (20.00) {3}	81.17 (51.48) {59}	112.50 (0.00) {1}	68.81 (37.21) {64}	105.00 (7.07) {2}	67.98 (37.78) {54}
90	100 (42.43) {2}	85.02 (49.66) {177}	100.00 (42.43) {2}	96.18 (59.63) {59}	- (-) {0}	80.29 (43.81) {64}	- (-) {0}	78.44 (42.50) {54}
100	148.15 (21.85) {27}	98.57 (55.63) {177}	145.00 (15.81) {10}	105.59 (66.50) {59}	156.25 (17.68) {8}	94.56 (49.98) {64}	144.44 (30.05) {9}	95.65 (48.83) {54}

Expectations are surprisingly well calibrated, especially in Russia and in South Africa.

Table 3 suggests no substantial differences between expectations and average amounts returned but for very large amounts sent, especially for X=100CU. While trustors expect to get back about 150CU, trustees only return about 100CU on average. This difference is significant

in each country, 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).

Based on this preliminary analysis, we conclude that expectations of return cannot be 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," i.e. when sending everything, in which case trustors are too optimistic about returns. In order to better understand what is driving the variation in our sample, we will 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.

Table 4 below presents the regressions for the trustors (correlations are presented in Table A.3 in the Appendix). A basic model of demographic characteristics, trust attitudes and risk preferences explains very little of the variation observed (14% 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. The order effect becomes smaller and sometimes disappears when we include more controls. Column 2 presents a regression where we add the expected proportion returned, $Y/3X$, to the set of explanatory variables. This specification corresponds to our hypothesis H_1 . The coefficient on expectations is highly significant statistically and economically: an increase in expected returns by 1% increases the amount sent by 1CU, on average. Column 3 corresponds to the warm-glow hypothesis (H_2) 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.

In Column 4 we combine H_1 and H_2 and find that both expectations of return and warm-glow kindness drive trust decisions, although the coefficients on both, TDGgive and proportion expected back, decrease in magnitude when the two are included together. Including these behavioral variables substantially increases the variation explained. Adding expectations of return in Column 2 takes the R-squared from 0.14 to 0.51; adding the amount sent in the triple dictator game in Column 3 allows us to explain 29% of the variation. The full model, including both expectations of return and warm-glow kindness, explains 58% 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). Their 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, to whether they indicated that they trust strangers and to race effects in South Africa.

In none of our specifications does the amount given in the triple dictator game translate 1:1 into the amount sent in the trust game. In fact, 24 of our trustors send less in the trust game than in the triple dictator game, suggesting that at least some people are affected by the possibility of being betrayed in the trust game.

Table 4. Determinants of amount sent in the trust game.

	(1)	(2)	(3)	(4)	(5)	(6)
	Controls only	H ₁	H ₂	H ₁ &H ₂	H ₁ &H ₂ , if X ≥ 50	H ₁ &H ₂ , if X < 50
Risk aversion	-1.436 (2.010)	-1.745 (1.516)	-1.960 (1.831)	-2.056 (1.424)	0.853 (1.749)	-2.302 (1.046)*
Dictator 1st (yes=1)	-16.225 (5.447)**	-8.403 (4.177)*	-14.635 (4.963)**	-8.177 (3.919)*	-3.477 (5.359)	-5.486 (2.573)*
South Africa	13.257 (10.011)	8.949 (7.562)	6.661 (9.186)	5.092 (7.147)	-3.444 (9.784)	0.628 (4.584)
Russia	6.752 (8.451)	0.291 (6.404)	8.351 (7.693)	2.004 (6.020)	3.562 (8.118)	-7.034 (3.828)
US non-white	-4.709 (9.553)	-1.550 (7.211)	-0.507 (8.724)	0.864 (6.787)	0.569 (9.505)	-2.619 (4.125)
SA non-white	-29.581 (10.341)**	-19.301 (7.863)*	-19.925 (9.571)*	-14.067 (7.470)	-4.327 (10.934)	-9.877 (4.782)*
Gender (1=male)	-4.183 (5.852)	-3.365 (4.414)	-5.757 (5.331)	-4.477 (4.149)	4.406 (5.941)	-3.426 (2.585)
Age Group (1-6)	0.719 (4.511)	0.345 (3.403)	-0.451 (4.109)	-0.379 (3.196)	-1.208 (3.783)	-1.031 (2.272)
Economic situation (1-6)	-3.102 (3.156)	-2.792 (2.381)	-2.396 (2.874)	-2.363 (2.236)	1.642 (3.472)	-1.056 (1.362)
Economics major	1.114 (7.363)	-4.313 (5.578)	3.729 (6.715)	-2.044 (5.258)	-3.877 (6.737)	1.577 (3.358)
# of organizations	-1.029 (2.093)	-1.480 (1.579)	-0.443 (1.907)	-1.051 (1.485)	1.208 (2.330)	0.158 (0.877)
Trust strangers	3.977 (7.540)	0.878 (5.694)	0.522 (6.888)	-1.055 (5.360)	-4.207 (6.193)	-9.813 (4.189)*
Proportion expected back		99.763 (9.673)**		89.416 (9.368)**	91.128 (17.639)**	27.408 (6.401)**
TDGgive			0.693 (0.127)**	0.452 (0.102)**	0.147 (0.113)	0.462 (0.099)**
Constant	67.232 (19.073)**	41.131 (14.606)**	51.529 (17.586)**	33.592 (13.807)*	24.973 (19.080)	29.271 (9.619)**
Observations	152	152	152	152	73	79
R-squared	0.14	0.51	0.29	0.58	0.38	0.46
Adjusted R-squared	0.07	0.47	0.23	0.53	0.23	0.34

The dependent variable is X, the amount sent in the trust game.
Standard errors in parentheses. * significant at 5%; ** significant at 1%.

The trust game results by subgroup are presented in Table A.4 in the Appendix. The most notable differences are in the regressions for men and women (Columns 1 and 2). Women are driven by expectations of reciprocity a lot more than men—the coefficient on expected fraction returned is twice as high for women than it is for men. In contrast, men are motivated by warm-glow kindness (as represented by TDGgive) to a large extent in their decision to trust, whereas there is no connection between unconditional kindness and trust for women. These findings accord well with Buchan et al.'s (2003) large-scale study on trust and gender where male trustors are much more likely than women to report 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.

Finally, our regressions also suggest that nonwhites trust less in South Africa but not in the U.S. This seems to apply to men only: In South Africa, nonwhite men send less and white men more than Americans. 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.

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 been interpreted as an indicator for reciprocity in the literature so far.²⁸ However, without further

²⁸ 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."

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.

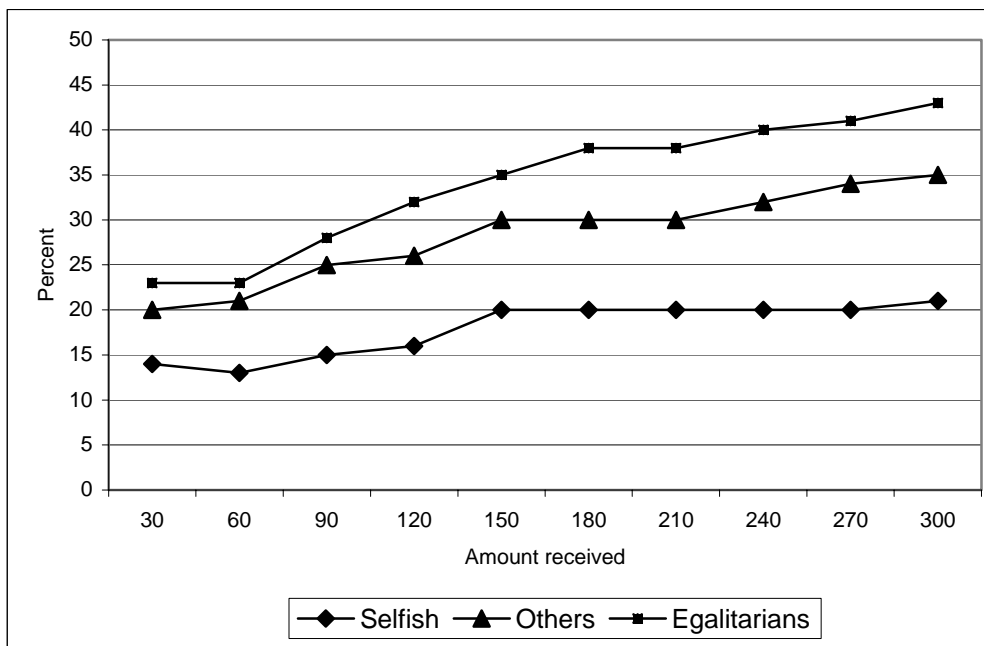


Figure 2: Fractions remitted in the trust game by distributional preference type

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.

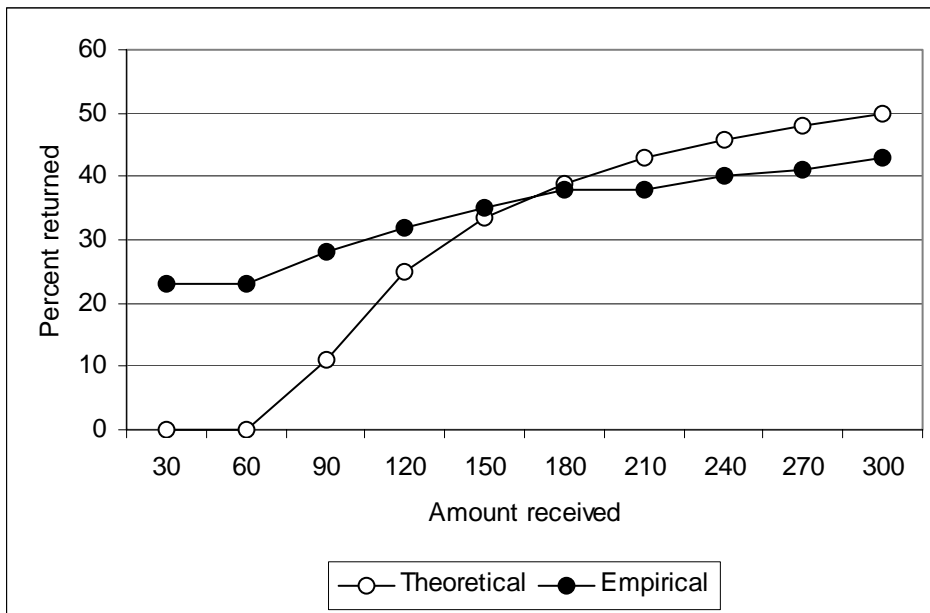


Figure 3: Fractions remitted by egalitarian types-based on their predicted (theoretical) and observed (empirical) remit functions.

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 5% of the variation in our sample. The only significant control variable is “Trust strangers,” 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 sent in the trust game (H_1), amount given in the dictator game and predicted distributional preference (H_2) – are included, all have high statistical and economic significance. One extra CU received (the possible range for amount received is 30CU to 300CU) 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 15% more of the amount received than when she is sent only 30CU. 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 the reciprocity (Amount received) and warm-glow (DGgive) hypotheses are combined (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 about 20%.

Table 5. Percentage returned in the trust game.

	(1) Controls only	(2) H0	(3) H1, based on DGgive	(4) H1, based on predicted remit	(5) H0 & H1, based on DGgive	(6) H0 & H1, based on predicted remit
Risk aversion	-0.008 (0.010)	-0.008 (0.010)	-0.009 (0.009)	-0.009 (0.009)	-0.009 (0.009)	-0.009 (0.009)
Dictator 1st (yes=1)	-0.023 (0.024)	-0.023 (0.024)	-0.015 (0.022)	-0.016 (0.022)	-0.015 (0.022)	-0.017 (0.022)
South Africa	0.028 (0.040)	0.028 (0.040)	0.025 (0.037)	0.025 (0.038)	0.025 (0.037)	0.025 (0.038)
Russia	0.063 (0.034)	0.063 (0.034)	0.060 (0.031)	0.056 (0.032)	0.060 (0.031)	0.057 (0.032)
US non-white	0.009 (0.035)	0.009 (0.035)	0.033 (0.036)	0.022 (0.035)	0.033 (0.036)	0.020 (0.035)
SA non-white	-0.020 (0.041)	-0.020 (0.041)	-0.023 (0.037)	-0.023 (0.038)	-0.023 (0.037)	-0.023 (0.038)
Gender (1=male)	-0.003 (0.026)	-0.003 (0.026)	-0.001 (0.023)	-0.000 (0.023)	-0.001 (0.023)	-0.001 (0.024)
Age Group (1-6)	0.002 (0.021)	0.002 (0.021)	0.000 (0.020)	-0.001 (0.020)	0.000 (0.020)	-0.000 (0.020)
Economic situation (1-6)	-0.002 (0.011)	-0.002 (0.011)	0.003 (0.011)	0.004 (0.011)	0.003 (0.011)	0.003 (0.011)
Economics major	0.047 (0.033)	0.047 (0.033)	0.032 (0.030)	0.031 (0.030)	0.032 (0.030)	0.033 (0.030)
# of organizations	-0.001 (0.008)	-0.001 (0.008)	-0.001 (0.007)	-0.001 (0.007)	-0.001 (0.007)	-0.001 (0.007)
Trust strangers	0.074 (0.028)**	0.074 (0.028)**	0.049 (0.026)	0.050 (0.026)	0.049 (0.026)	0.053 (0.026)*
Received (3X)		0.00054 (0.00007)**			0.00054 (0.00007)**	0.00015 (0.00009)
DGgive			0.003 (0.001)**		0.003 (0.0006)**	
Predicted remit				0.430 (0.052)**		0.387 (0.067)**
Constant	0.258 (0.072)**	0.169 (0.074)*	0.178 (0.074)*	0.202 (0.072)**	0.089 (0.075)	0.182 (0.072)*
Observations	1630	1630	1630	1630	1630	1630
R-squared	0.05	0.12	0.16	0.20	0.22	0.21
Adjusted R-squared	0.05	0.11	0.15	0.20	0.22	0.20

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 5%; ** significant at 1%

An analysis of trustee behavior by subgroups (Table A.5, see Appendix) reveals that Russian men remit somewhat more than Americans and that most groups 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, in contrast to Russians and South Africans, is overwhelmingly driven by reciprocity rather than by unconditional kindness.

IV. Discussion and Conclusions

The heterogeneity in trust and trustworthiness behavior can be better accounted for if, in addition to visible personality characteristics and attitudes, invisible individual attributes such as expectations of return, a taste for reciprocity and unconditional kindness are taken into consideration. Unconditional kindness is an important predictor of trust and trustworthiness (*ceteris paribus*). In fact, whether or not to trust does not seem to be an investment decision under uncertainty for the majority of the people. Rather, as Kramer (1999) put it, trust is also a “social orientation toward people and toward society as a whole”.

Accounting for the variation in behavior is only a first step towards better understanding what drives people to trust and to be trustworthy. We propose to also look for heterogeneity in motives: Even though different groups of people may exhibit a similar degree of trust and trustworthiness, the different possible driving forces may not be equally important

for all groups. We find that women are motivated differently than men when deciding about whether to trust or not, independent of their race or the country of origin: They trust conditional on their expectations of return. In contrast, unconditional kindness substantially affects men's trust behavior. Our data also suggest that Americans' trustworthiness is accounted for differently than the fractions Russians or South Africans remit. In the United States, reciprocity is a robust determinant of trustworthiness while in Russia and South Africa, unconditional kindness seems most relevant.

Our results suggest that the relative importance of various sets of possible determinants of trust and trustworthiness depends on the characteristics of the subject pool. We suspect that some of the mixed evidence from earlier experiments could be reconciled if the data was further disaggregated and 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. Two thirds of their trustees rewarded trust if a trustor voluntarily chose to trust but only one third rewarded trust if a trustor was forced to trust. 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 2002), for example, while it has been found to affect behavior in a moonlighting game (Falk, Fehr and Fischbacher 2000).

This set of experiments is a first attempt at 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. They enable us to not only account for heterogeneity in behavior but also control for heterogeneity in motivation. Our results suggest substantial motivational heterogeneity. Some people in fact make a bad investment when trusting; most people do not. They enjoy being kind to others, even if these others are anonymous strangers.

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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
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	Xxx xxx
Warm-glow kindness for Trust	TDGgive	Amount subject sends in Triple Dictator Game	0 to 100CU
Reciprocity	Received	Amount trustee receives in Trust Game, equals "Send Trust" * 3	0 to 300CU
Trustworthiness	Percent remitted	Amount trustee returns, as a proportion of amount received	0 to 1
Expectations of return	Prop. expected back	Amount trustor expects back, as a proportion of amount received by trustee	0 to 1
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 1st					
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 (.61) {241}	1.72 (.56) {116}	1.61 (.56) {200}	1.62 (.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					
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	SOUTH AFRICA	UNITED STATES	SA: WHITE	SA: NON-WHITE	US: WHITE	US: NON-WHITE
	Mean (s.d.) {N}	Mean (s.d.) {N}	Mean (s.d.) {N}	Mean (s.d.) {N}	Mean (s.d.) {N}	Mean (s.d.) {N}	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 1st							
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							
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	-0.4782
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	-0.2658
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	-0.257	-0.0072	0.0932	-0.1725	1		
SA non-white	-0.274	0.0278	0.1431	-0.0815	-0.1523	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)	(2)	(3)	(4)	(5)	(6)	(7)
	Men	Women	White	Non-white	Russia	US	South Africa
Prop. expected back	60.600 (13.339)**	120.947 (12.346)**	85.673 (11.745)**	97.292 (17.551)**	69.291 (19.555)**	107.725 (14.522)**	105.793 (16.304)**
TDGgive	0.628 (0.128)**	0.071 (0.176)	0.493 (0.122)**	0.593 (0.227)*	0.771 (0.316)*	0.488 (0.169)**	0.356 (0.130)**
Risk aversion	-3.223 (1.902)	0.980 (2.097)	-1.894 (1.720)	-2.326 (2.537)	-2.686 (3.156)	1.117 (2.434)	-2.598 (2.281)
Dictator 1 st (yes=1)	-11.831 (5.507)*	-1.218 (5.279)	-8.352 (4.881)	-16.009 (6.820)*	-17.752 (8.666)*	1.357 (6.728)	-6.060 (6.400)
South Africa	24.260 (11.395)*	-3.000 (8.789)	8.733 (8.162)	-8.813 (6.659)			
Russia	7.808 (8.164)	8.562 (8.685)	-1.334 (6.558)				
US non-white	-5.335 (12.535)	-3.592 (7.748)				3.831 (6.304)	
SA non-white	-24.551 (10.862)*	-6.546 (9.737)					-17.866 (7.127)*
Gender (1=male)	0.000 (0.000)	0.000 (0.000)	-4.297 (5.173)	-12.367 (7.971)	3.615 (12.265)	-7.961 (7.044)	2.761 (5.859)
Age Group (1-6)	3.882 (4.964)	-0.667 (3.998)	-4.056 (3.784)	16.770 (6.926)*	2.808 (9.558)	-1.364 (4.154)	-1.213 (6.671)
Economic situation (1-6)	-7.972 (3.897)*	-2.177 (2.587)	-5.049 (2.882)	5.689 (3.413)	2.033 (8.175)	-2.891 (2.936)	-5.289 (3.935)
Economics major	-13.603 (8.667)	1.439 (6.407)	-5.367 (6.617)	8.718 (8.677)	32.443 (31.483)	-1.804 (8.016)	-14.767 (6.576)*
# of organizations	-0.862 (2.188)	-0.622 (1.952)	-0.512 (1.820)	-0.940 (2.706)	-4.123 (3.767)	-3.601 (2.116)	4.885 (2.441)
Trust strangers	12.980 (8.378)	-6.967 (6.841)	-2.895 (6.556)	0.636 (10.129)	27.888 (17.555)	-10.433 (8.468)	3.347 (7.308)
Constant	41.623 (19.213)*	18.620 (17.713)	48.523 (17.118)**	-23.173 (26.036)	20.110 (38.997)	20.975 (18.495)	41.769 (26.223)
Observations	79	73	112	40	48	54	50
R-squared	0.65	0.67	0.56	0.72	0.50	0.72	0.75
Adjusted R-squared	0.58	0.60	0.50	0.61	0.37	0.64	0.67

The dependent variable is X, the amount sent in the Trust Game. Standard errors in parentheses

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

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Men	Women	White	Non-white	Russia	US	South Africa
Received (3X)	0.0006 (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	0.003 (0.001)**	0.003 (0.001)**	0.004 (0.001)**	0.002 (0.001)*	0.005 (0.001)**	0.001 (0.001)	0.004 (0.001)**
Risk aversion	-0.025 (0.012)*	0.021 (0.012)	-0.007 (0.012)	-0.008 (0.015)	-0.016 (0.016)	-0.014 (0.017)	0.000 (0.016)
Dictator 1st (yes=1)	-0.007 (0.028)	-0.000 (0.040)	-0.021 (0.028)	-0.008 (0.040)	-0.021 (0.037)	-0.001 (0.045)	-0.059 (0.035)
South Africa	0.029 (0.049)	0.033 (0.054)	0.020 (0.039)	-0.018 (0.035)			
Russia	0.093 (0.037)*	-0.043 (0.059)	0.065 (0.036)				
US non-white	0.084 (0.047)	0.004 (0.052)				0.027 (0.035)	0.000 (0.000)
SA non-white	-0.043 (0.061)	0.016 (0.051)					-0.045 (0.042)
Gender (1=male)	0.000 (0.000)	0.000 (0.000)	0.011 (0.032)	-0.030 (0.044)	0.056 (0.053)	-0.008 (0.033)	-0.020 (0.037)
Age Group (1-6)	0.001 (0.027)	0.006 (0.026)	0.025 (0.024)	-0.034 (0.035)	0.008 (0.040)	-0.007 (0.031)	-0.011 (0.038)
Economic situation (1-6)	0.003 (0.014)	0.019 (0.021)	0.013 (0.014)	-0.006 (0.018)	0.001 (0.019)	-0.001 (0.016)	0.001 (0.026)
Economics major	0.061 (0.049)	-0.018 (0.041)	0.041 (0.039)	0.010 (0.052)	0.000 (0.000)	0.067 (0.051)	0.021 (0.041)
# of organizations	-0.012 (0.009)	0.017 (0.011)	0.003 (0.009)	-0.006 (0.013)	-0.007 (0.015)	-0.001 (0.009)	0.014 (0.014)
Trust strangers	0.056 (0.037)	0.038 (0.036)	0.050 (0.033)	0.061 (0.040)	0.003 (0.065)	0.058 (0.039)	0.065 (0.037)
Constant	0.120 (0.090)	-0.118 (0.124)	-0.032 (0.101)	0.264 (0.122)*	0.091 (0.151)	0.142 (0.124)	0.138 (0.154)
Observations	930	700	1040	590	550	530	550
R-squared	0.28	0.26	0.28	0.17	0.29	0.21	0.24
Adjusted R-squared	0.27	0.25	0.27	0.15	0.28	0.20	0.23

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 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)	0.00016 (0.0001)	0.00013 (0.00014)	0.00017 (0.00012)	0.00013 (0.00015)	0.00006 (0.00016)	0.0005 (0.00015)**	-0.00012 (0.00018)
Predicted remit	0.434 (0.101)**	0.333 (0.084)**	0.425 (0.086)**	0.311 (0.106)**	0.559 (0.138)**	0.205 (0.092)*	0.403 (0.116)**
Risk aversion	-0.024 (0.013)	0.020 (0.013)	-0.005 (0.013)	-0.009 (0.015)	-0.011 (0.018)	-0.013 (0.017)	0.000 (0.016)
Dictator 1st (yes=1)	-0.003 (0.029)	-0.011 (0.040)	-0.017 (0.029)	-0.010 (0.039)	-0.005 (0.038)	-0.002 (0.044)	-0.060 (0.038)
SouthAfrica	0.032 (0.051)	0.036 (0.055)	0.017 (0.038)	-0.011 (0.034)			
Russia	0.086 (0.037)*	-0.039 (0.061)	0.059 (0.036)				
US non-white	0.061 (0.044)	0.001 (0.051)				0.025 (0.036)	0.000 (0.000)
SA non-white	-0.053 (0.063)	0.016 (0.052)				0.000 (0.000)	-0.046 (0.043)
Gender (1=male)	0.000 (0.000)	0.000 (0.000)	0.021 (0.033)	-0.034 (0.043)	0.071 (0.057)	-0.008 (0.033)	-0.026 (0.039)
Age Group (1-6)	0.003 (0.027)	0.001 (0.026)	0.023 (0.025)	-0.032 (0.034)	0.006 (0.041)	-0.008 (0.030)	-0.001 (0.038)
Economic situation (1-6)	0.004 (0.014)	0.015 (0.021)	0.013 (0.014)	-0.006 (0.018)	0.005 (0.020)	-0.001 (0.016)	0.002 (0.026)
Economics major	0.054 (0.053)	-0.013 (0.041)	0.050 (0.040)	0.007 (0.052)	0.000 (0.000)	0.067 (0.049)	0.016 (0.046)
# of organizations	-0.010 (0.009)	0.016 (0.011)	0.004 (0.010)	-0.005 (0.012)	-0.003 (0.015)	-0.001 (0.009)	0.011 (0.014)
Trust strangers	0.060 (0.036)	0.041 (0.038)	0.062 (0.032)	0.056 (0.041)	0.020 (0.060)	0.062 (0.039)	0.053 (0.039)
Constant	0.209 (0.084)*	0.004 (0.119)	0.063 (0.101)	0.322 (0.115)**	0.168 (0.154)	0.177 (0.114)	0.255 (0.151)
Observations	930	700	1040	590	550	530	550
R-squared	0.27	0.23	0.24	0.18	0.26	0.22	0.20
Adjusted R-squared	0.26	0.22	0.23	0.16	0.25	0.21	0.18

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 5%; ** significant at 1%