ATTITUDINAL AND BEHAVIORAL MEASURES OF TRUST: A NEW COMPARISON*

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Abstract:

We revisit the question first raised by Glaeser et al. (2000): do attitudinal survey questions predict trusting actions in games? We design an experiment where the same set of subjects participates in a series of surveys and games, all meant to capture trust. We find that the answer to the above question is not straightforward. When we do not control for other-regarding preferences, we are able to replicate others' findings that attitudinal questions about trust do not predict trusting actions, but are good predictors of trustworthiness. On the other hand, when we control for altruism using the triadic design introduced by Cox (2004), we find that most attitudinal questions are good predictors of trusting actions. In addition, some survey questions also predict behavior in binary trust games and cooperation in the public goods game. Our results add doubt to the general consensus that seems to have emerged among experimental economists that attitudinal survey questions are poor predictors of trusting actions in games.

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1. Introduction

Trust is central to the theory of social capital, and differences in social capital are thought to explain differences in economic growth (Arrow, 1974; Knack and Keefer, 1997). Although social scientists disagree about how best to measure trust[1], currently most economists rely on two measurement techniques: surveys and games. Surveys such as the General Social Survey (GSS) and World Values Survey (WVS) yield attitudinal trust measures, and games conducted in the lab yield behavioral measures. However, according to several recent studies, results from these two alternative approaches do not align as closely as one might expect. This finding is important because social scientists often use survey answers to make inferences about the level of trust in a society. If, in fact, surveys cannot predict trusting actions in the least complex scenarios (i.e., the lab), should we rely upon them to accurately reflect people's level of trust in the real world?

Most economists prefer an observable measure of trust to attitudinal or behavioral survey questions. Surveys, after all, rely on answers to questions, which can generate response biases. For example, there is some evidence from the psychological literature (see Nisbett and Wilson, 1977) that people have limited self-knowledge, which could bias virtually any verbal response.[2] Thus, when asked: "*Generally speaking, would you say that most people can be trusted, or that you cannot be too careful when dealing with others?*" responders do not really know what to say; their answers may reflect what they think others expect them to think, or what they think others

[1] This disagreement seems to stem from a general lack of consensus among social sciences about what trust really is (see Hosmer, 1995 for a survey).

[2] Some also argue that attitudinal measures of trust are vague. For instance, the GSS trust question (identified in the corresponding paragraph in the text) does not define 'most people'. Although researchers have interpreted the question to measure trust towards one's compatriots, the question may be understood as referring to an individual's inner circle, neighborhood, city, county, or state (Leigh, 2006).

think. A careful look at experimental research, however, reveals that games often used to measure trust may be biased as well. Cox (2004) and Cox et al. (2007, and 2008), for example, argue that the experimental designs so far used to generate the trust data do not discriminate between actions motivated by trust or reciprocity and actions motivated by (unconditional) altruism.[3]

In this paper, we revisit the question first raised by Glaeser et al. (2000): do survey questions about trust predict trusting actions? To answer this question, we design a within subject study, where the same subjects participate in a series of games and surveys. The surveys include behavioral and attitudinal questions aimed at capturing trust – some of the survey questions we study are included in both the WVS and the GSS. The games provide subjects with the option of voluntarily placing resources at the disposal of other(s) without a commitment. We use widely studied games in the literature: the investment game, as introduced by Berg, Dickhaut, and McCabe (1995) (also commonly known as the trust game), the binary trust game, and the public goods game. In contrast to other authors who have studied the correlation between surveys and choices in experiments, we also use the triadic design proposed by Cox (2004) and Cox et al. (2007 and 2008) – explained below – to control for altruism in the investment game. Using this triadic design, we find that players in the investment game have altruistic motives for transferring money and that, when we control for altruism, attitudinal questions can predict behavior. This finding is important because it supports the continued use of the GSS and WVS questions to measure trust for policy purposes and suggests that

[3] Others, including Ashraf, et al. (2006), Karlan (2005) and Schechter (2007), argue that choices in a trust game may also reflect attitudes towards risk. As described in the experimental procedures, we elicited self-reported motives for transferring amounts to Players B; 58% of these subjects said that they were motivated by trust; 14% mentioned altruism or care for others. Other reasons identified included: selfishness, efficiency, safety or risk, and confusion.

practitioners in the field may want to include surveys in their protocols when designing trust experiments.

As we discuss below, the innumerable design differences in the vast literature on trust experiments in the field make comparisons across studies difficult. For example, to measure trust some authors, such as Guth et al. (1997), use binary games, some use close variations (see Barr, 2003 and Karlan, 2005), and others use Berg et al.'s investment game. To our knowledge, no one, so far, has empirically tested whether the decisions in the simplest version of a trust game, the binary trust game, correlate with the decisions in the investment game, and whether survey responses can predict actions that reflect either complete trust or no trust (i.e., a binary decision). We find that behavior in the investment game (whether or not we control for altruism) and the binary trust game are correlated. This finding suggests that subjects' responses when we ask them to either take an action that puts them in a vulnerable position or not (i.e., make a binary choice) do provide information about whether or not the subject trusts.

Finally, we also consider the public goods game as a behavioral measure of social capital. Contributing to a public good requires people to trust others, as people have a chance of incurring a loss, if others are opportunistic, but also of realizing mutual gains, if others are cooperative. By comparing behavior in this game with behavior in the above-mentioned trust games, we find that actions in the public goods game correlate with those in the investment and binary trust games, but interestingly, they do not correlate with behavior in the investment game when we control for altruism.[4]

We contribute to the existing literature on trust games in the following ways: First, we add doubt to the consensus that seems to have emerged that surveys do not predict behavior in

[4] Behavior in public goods games in conjunction with behavior in trust games has also been studied by Gachter, et al. (2004), and Karlan (2005).

the lab.[5] This finding is important because it informs practitioners that it is reasonable to use survey data to measure trust. In addition, our results suggest that longitudinal studies based on GSS data, which has been gathering data since 1972, and cross country analyses based on WVS data can be reliable. Second, in our within subject study, we are the first to compare alternative laboratory measures of trust to determine whether subjects' responses in these games correlate. Our results suggest that people who run experiments in the field should be careful about the experimental design, because variations in trust games can generate different results as to which variables can explain behavior. The prevailing use of different types of games in the field to measure trust makes it difficult to study the effects of individual characteristics, institutions, and culture on trust. Surveys have the advantage over experiments in that they can be more easily and homogeneously implemented across cultures and, when possible, should always be implemented with games. In this sense, our results support the idea put forward by Fehr et al. (2002), who provide a way to nicely integrate interactive experiments and representative surveys in a seamless and inexpensive way.

The rest of the paper is organized as follows. In the next section we define trust and how it is measured. In Section 3, we describe our experimental design and the procedures. We present our results in Section 4, and the last section, Section 5, includes a summary of our findings and a discussion of the implications and limitations of our study.

2. Trust and how it is measured

[5] There are other authors (Lazzarini el al.,2004 in face-to-face interactions and Holm and Danielson, 2005 in Sweden, but not Tanzania) who observed that attitudinal questions predicted trusting actions in investment games; however, these authors do not elaborate on this issue (i.e., their objectives were not to compare alternative measures of trust).

While scholars across disciplines agree on the importance of trust in interpersonal exchanges, agreement on a precise definition of trust remains elusive (see Hosmer, 1995 for a survey of trust definitions across multiple disciplines). Most experimental economists have adopted Coleman's definition (Coleman, 1990), as it provides a measurable definition of trust (see Camerer 2003, for a review of the literature). According to Coleman, trust is an action that involves the voluntary placement of resources at the disposal of a trustee with no enforceable commitment from the trustee. A trusting action creates the possibility of mutual benefit, if the trustee is cooperative and the possibility of individual loss, if the trustee is opportunistic. Trust involves taking a risk; the extent of which is determined by the degree of confidence that one has in others.[6]

In general, trust is measured through surveys that include attitudinal questions designed to capture the degree of confidence one has in others. The idea behind these measures is that people will behave trustingly if they believe others are trustworthy (i.e., confidence in others is a necessary condition for a trusting action). One such question is the 'trust question', which was first introduced by Almond and Verba (1963) in their study of civil society in post-war Europe. The text of this question reads, "*Generally speaking, would you say that most people can be trusted, or that you can't be too careful when dealing with others?*" Individuals who answer that most people can be trusted are labeled as trusting. When aggregated, the percentage of the sampled people who say most people can be trusted forms an estimate of the level of trust in a country and serves as an indicator for national social capital. Many national and international surveys, including the GSS, the WVS, Latinobarómetro, and the Australian Community Survey,

[6] The interpretation of trust as an action may be somewhat controversial. However, the purpose of this paper *is not* to develop a "best definition of trust"; here, we want to see whether widely used attitudinal questions about trust (found in the GSS and WVS surveys) can predict actions in trust games that have been widely used in the field to measure trust, and whether these results are robust to controlling for altruism using the triadic design. For an excellent cross-country study of what motivates people to trust, please refer to Ashraf et al. (2006).

use the trust question. Despite its popularity in social sciences, problems with the trust question do exist; a specific one being that it does not specify who 'most people' are. Thus, a question that asks people to agree or disagree with *"You can't count on strangers anymore"* has been proposed as an alternative to the trust question, as it more narrowly identifies the people about whom one is asked to express an opinion (see Glaeser et al., 2000).

Other attitudinal questions often used in surveys include the following: "*Do you think most people would try to take advantage of you if they got the chance, or would they try to be fair?*", and "*Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?*" These two questions together with the 'trust question' are asked in the GSS and are often referred to as GSS trust, GSS fair, and GSS help questions. The WVS includes the trust and fair questions only. Because all three questions capture an individual's confidence in others, an index called the GSS index that equally weights answers to these questions is often formed. This GSS index has been widely used as an alternative measure of trust. In addition to these attitudinal questions, more recently, researchers have developed surveys that include behavioral questions. These behavioral questions ask whether the subject lies to peers and family members, whether he lends money and possessions, and whether he leaves his door unlocked. An honesty index and a behavioral trust index are formed from the answers to these questions (see Glaeser, et al. (2000) and Gachter, et al. (2004)).

A second form of measurement is through the 'trust game', which is played by groups of subjects under lab conditions. Several variations of the 'trust game', which we discuss below, exist, but all have a basic feature of allowing a player to transfer money to another player, who receives a multiple of the initial amount transferred and, in turn, has the option of returning

money or keeping it. Depending on the specific type of trust game, trust is then measured by whether money is passed or by the amount passed.

Perhaps the first 'trust game' was designed by Camerer and Weigelt (1988). While the primary purpose of their work was to examine a sequential equilibrium reputation model, similar binary choice games that followed were specifically designed to measure trust and differed in that they were one-shot games (see, Guth, Ockenfels and Wendel, 1997; Guth and Kliemt, 1994). An example of the binary trust game can be found in Figure 1. In this game, the first mover, Player A, is given the choice to either stop (S) or continue (C). After S, the game is over, whereas it continues after C, with Player B's choice between Exploit (E) and Reciprocate (R). For payoff values $r<s<t<u$, the sub-game perfect equilibrium is for Player B to choose E and Player A to choose S. Behaviorally, a choice of C, however, represents a kind of 'investment' the first mover makes in a potentially mutually beneficial outcome; and such an investment has some risk. Indeed, if C is chosen, Player B has an opportunity to be opportunistic. The choices made in binary trust games do provide important behavioral measures of trust and reciprocity; however, a short-coming is the all-or-nothing nature of the decisions. A first mover either ends the game (does not trust), or she continues the game (trusts). Thus, in this setting, it is impossible to gather information about the degree or level of trust an individual has towards others.

[Insert Figure 1: About here]

A game more widely used to measure trust is the "investment game" of Berg, Dickhaut, and McCabe (1995). This is also a dynamic game of complete information between two players

with identical endowments, say $\bar{x}$. The first player, called the investor, faces a choice to transfer to the second player, or trustee, any amount $x \in [0, \bar{x}]$. Then, x is multiplied by t>1 and the trustee has an opportunity to transfer back any amount $y \in [0, tx]$. The payoffs for the first and second players are $\bar{x} - x + y$ and $\bar{x} + tx - y$, respectively.[7] Clearly, under the traditional game theoretic assumptions, the equilibrium amount to transfer is zero. In the lab, however, many people transfer positive amounts (see Camerer, 2003 for a summary of results). Generally speaking, the amount invested, *x*, is taken to be a measure of the degree of trust; and the percentage returned or *y/tx* is taken to be a measure of the degree of trustworthiness.

In an influential paper on trust, Glaeser et al., (2000) provide evidence that the trust question and other standard survey measures of trust do not predict first players' actions in a version of the game described above. Rather, they find that these questions predict second movers' actions.[8] As mentioned before, this result is extremely important for two main reasons. First, trust is central to the theory of social capital, and differences in social capital are thought to explain differences in growth (Arrow, 1974). If survey questions on trust, as compiled by the WVS do not measure trust, it would be difficult to study the hypothesis that social capital is correlated with higher growth rates. Second, without reliable longitudinal data on trust, like that which is provided by the GSS and Latinobarómetro, one could not make an assessment about the changes in trust that a society experiences. More specifically, we could not tell whether the disturbing declining trend in trust and organizational involvement in the U.S., as measured by survey responses and recorded by Putnam (1995, 2000) and many others since then, really matters.

[7] The investor game as described here follows the design of Berg et al. (1995). However, several variations and extensions have since been introduced, some of which we will address later in this paper.

[8] It is worth noting that more than the evaluation of the reliability of survey questions, Glaeser et al.'s (2000) main contribution lies in the integration of experiments with surveys to measure individual-level characteristics such as trust and trustworthiness.

Perhaps inspired by Glaeser et al.'s (2000) finding, many researchers have chosen to conduct trust experiments in the field to make inferences about trust levels in certain populations instead of, or in addition to, asking survey questions. Table 1 provides a summary of trust games played around the world, primarily in developing countries as much of the social capital literature is concerned with the effects of trust (or lack of trust) on growth[9], and Table 2 provides a summary of recent trust games played in the US with student subjects.[10]

[Insert Table 1: About here]

[Insert Table 2: About here]

Table 1 shows that ten of our compiled set of twenty trust studies conducted in the field combine survey questions with trust games; five of the ten specifically asked GSS questions.[11] Interestingly, most of these studies did not find a correlation between answers to attitudinal trust questions and behavior in games. Only Lazzarini et al. (2004) in Brazil under face-to-face interactions, but not anonymous interactions, and Holm and Danielson (2005) in Sweden, but not Tanzania, find a positive correlation between behavior in games and the GSS trust. Unfortunately, it is difficult to say whether the discrepancy in results (i.e., some people find a correlation between survey answers and behavior in games, but others do not) has to do with

[9] Cardenas and Carpenter (2008) provide an excellent summary of results from trust games conducted in developing countries.

[10] These two tables are not comprehensive, as the literature on trust games is rather large and not all authors report data in a format amenable to our table. However, these tables do contain relevant information that we will revisit later on in the paper.

[11] In addition to the studies included in Table 1, several other authors conducted experiments combining surveys and games in Europe (see, for instance, Fehr et al. (2002) and Bellemare and Kroger (2007), who used the strategy method and found that survey questions do not predict second players' choices; that is, trustworthiness).

cultural differences (i.e., subject pool), or with differences in experimental design, or both.[12] While we believe that the investment game is muddled with altruism, and that that explains why the GSS questions generally do not predict behavior, of the twenty studies that we list in Table 1, over half, including Carter and Castillo (2003, 2005), Karlan (2005), and Schechter (2007), did not use the (Berg et al.) investment game.[13]

Although, in principle, any game where a player is given the choice of putting resources at the disposal of a trustee would qualify as a game of trust, it is not clear whether, in practice, all situations have an equal ability of isolating trust.[14] For example, limiting amounts to pass to two or three units (as opposed to ten), limits the strategy space. In this paper, we will compare results from the simplest trust game, the binary trust game, with those of an investment game to see whether they correlate. This will help us determine whether findings regarding trust using different games are comparable.

In Table 2 we list studies that, like ours, were conducted in the US with student subjects. All of these studies used the investment game with the noted modifications. Two studies, Glaeser et al.(2000) and Ashraf et al. (2006), also include surveys. These authors find that GSS survey questions do not correlate with trusting actions. However, neither of these authors provided an initial equal endowment to both players; a design feature which may, in part, explain

[12] Upon close examination of Table 1, one can see a wide variety of design differences (including differences in endowments between players, in the amount by which transfers are multiplied, and in the amount eligible for return by Player B); these design differences could influence how a subject plays the game. While a close examination of the impact of each of these design differences is well beyond the scope of this paper, it is worthwhile to emphasize that one simply cannot make fruitful comparisons across studies. An advantage of having good survey measures of trust is that questions are easier to implement in the field, and are less susceptible to design variability and experimenter induced biases.

[13] Some of these authors used a modified game that was closer to the binary trust game; others provided first movers and second movers with unequal endowments. The complications with running experiments in the field may explain why some of these authors did not use the investment game.

[14] Several other authors have altered the investment game for the specific purposes of robustness checks. For instance, Anderson et al., (2006) vary the endowments for subjects, Eckel and Wilson (2002) allow players to choose their own partners, Burks et al. (2003) let subjects play both roles, and Anderhub et al. (2002) implement a repeated trust game with incomplete information.

why in Glaeser et al.'s study, more than 70% of the subjects sent the maximum amount to the trustee. Because players may have other-regarding motives (e.g., unconditional altruism) for making an initial transfer of funds to the trustee, the unequal initial endowment may generate additional incentives to pass, and further bias the intended measure of trust. We will use a subset of the papers listed in Table 2 to compare to our results. One question that we address in this paper is whether we can replicate the result that attitudinal questions about trust are poor predictors of trusting actions.

3. Experimental Design

Our experiment consists of games and surveys played by the same set of subjects. We will begin the next sub-section by describing each of the parts in our experiment.

3.1 Games

A. The triadic trust design

As mentioned above (see Section 2), the investment game was introduced by Berg et al. (1995). Under the traditional game theoretic assumptions, the equilibrium amount to transfer is zero. Although any amounts transferred are typically viewed to indicate a level of trust, an investor in the investment game may have other motives for transferring funds, such as (unconditional) altruism. Similarly, a trustee may be motivated by altruism or reciprocity when passing positive amounts back. Cox (2004) discriminates between transfers resulting from trust or reciprocity and transfers resulting from other-regarding preferences. His design, called the triadic design, consists of three treatments: an investment game, a dictator game, and a modified dictator game. For the investment game, he followed closely the Berg et al. design. In the

dictator game, each dictator is given the chance to transfer an amount $x^d \in [0, \bar{x}]$, where $\bar{x}$ is the initial endowment, to a recipient who gets tx^d; the recipient makes no decisions. Earnings of the dictator and recipient are $\bar{x} - x^d$ and $\bar{x} + tx^d$, respectively. Each dictator in the modified dictator game can transfer an amount $y^{md} \in [0, tx]$ to a recipient, who has no choice to make. The earnings of the modified dictator and recipient are $\bar{x} + tx - y^{md}$ and $\bar{x} - x + y^{md}$, respectively. In Cox (2004) experiments $\bar{x} = \$10$ and $t = 3$, subjects were paired in groups of two, and they could transfer integer amounts only. No subject knew the identity of the person with whom she was paired, and all sessions were implemented under the double-blind condition. Finally, different subjects participated in the three different parts of the triadic game (between subject design). The results of Cox's experiments indicate that a portion of transfers in the investment game are, in part, due to social preferences (unconditional altruism or inequality aversion), not solely due to trust and reciprocity.

In our experiment, we implement Cox's triadic design to isolate trust from other-regarding motives.[15] However, unlike Cox, we implement a within subject experiment, where the same subjects participate in all three games. The within subject design allows us to control for individual differences in social preferences that have been observed in previous works (see for example Andreoni and Miller, 2002). In addition, we do not use a double-blind procedure, as our subjects had many choices to make, and a double blind methodology would complicate the implementation of the experiment.[16] Despite these design differences, we were able to replicate Cox's results for the first movers in the investment game and the dictators. In Figure 2 and on

[15] We are grateful to James C. Cox for generously sharing his instructions with us.
[16] Ideally we would have liked to use a double-blind procedure; however, not doing so did not seem to have biased our data. It seems that our subjects, none of whom had had previous interactions with us, were not pressured to be 'nice' in our presence nor were they pressured to be 'rational'.

Table 3 we present our data for the investment game and the dictator game and the data reported by Cox (2004).

[Insert Figure 2: About here]

Note that in Cox's and our experiments, about 80% of all subjects send positive amounts of money in the investment game, and more than 50% send positive amounts of money in the dictator game; these results indicate that there is unconditional altruism in our cohort of subjects, and it also indicates that many players in the investment game pass positive amounts because they trust. Indeed, like Cox, we observe that the mean amount sent by first movers in the investment game is greater than the mean amount passed in the dictator game ($p=0.000$; one - tailed). The last column of Table 3 shows that we were able to replicate Cox's results for the investment and dictator games.

[Insert Table 3: About here]

In our experiments, subjects in the dictator game passed, on average, $2.68, and in the modified dictator game passed, on average, $5.24. The differences in mean amounts in these two games have to do with the differences in initial amounts available for transfer. In the modified dictator game, the initial endowments are not the same for the dictator and recipient. Interestingly, the average transfer ratio in dictator and modified dictator games was around 27% and 28% of their endowment, respectively. In contrast to Cox, we find that the mean amount returned by the second player in the investment game is statistically equal to the mean amount passed by the modified dictator ($p=0.169$; one-tailed). A possible reason our results for the

modified dictator game differ from Cox's (see last row in the last column of Table 3) may be that those subjects (second movers) who received zero in the investment game were not dropped out of Cox's sample, which caused a downward bias in the modified dictator means.[17] However, to further see if reciprocity exists in the choices made by the second movers, we estimated a linear model with amounts transferred as a dependent variable, and the amounts received and initial endowment as independent variables; after correcting for heteroskedasticity, we find that our OLS estimated coefficients for the amount received and initial endowment are both positive and significant (coef. = 0.276 and 0.472, respectively; p = 0.000), which suggests that the amount transferred back to the first mover is also an act of reciprocity, not only altruism.

B. The binary trust game

Researchers also use the binary trust game depicted in Figure 1 to obtain a behavioral measure of trust and reciprocity.[18] The question of whether decisions in this game correlate with those in the investment game is important because trust games with reduced strategy space have practical advantages when implemented in the field. In our experiments, Players A (first movers) have a choice to stop (choose S) or continue (choose C) the game. After observing As' choices, the Bs (second movers) are asked to either reciprocate (choose R) or exploit (choose E) – see Figure 2.[19] In our experiments, we use the following payoffs r=5, s=10, t=15, and u=20.[20] We are interested in determining whether trusting actions and reciprocal actions in this game

[17] Although the difference between the behavior of our second players and Cox's second players are interesting, in this paper we are interested in trust measures; here, we concentrate on the behavior of the first players, which we were able to replicate in our study.
[18] Guth and Kliemt (1994) have used similar games to examine whether cooperation based on trust can evolve.
[19] Note that Players B instructions also read "Stop" or "Continue" so as not to frame the subjects' choices.
[20] We find that 31 out of 63 (about 49%) subjects choose C, and 17 out of 32 (about 53%) choose R.

correlate with trusting and reciprocal actions in the investment game and whether individual characteristics and trust attitudes can predict behavior in this game.

It is worth noting that McCabe, Rigdon, and Smith (2003) have addressed other-regarding behavior in binary trust games. The authors designed an experiment where subjects either played a binary trust game or a binary dictator game. The latter closely resembles the first; however, in the second game, Players A had no move. Player B could choose between the following two allocations: (r, u) or (t, t), as shown in Figure 3. By comparing the *proportion* of Bs that reciprocated in the binary trust game with the *proportion* of dictators who chose the (t, t) allocation, the authors were able to find an estimate of the 'true' fraction of reciprocal choices. Presumably, a similar game could be constructed to isolate the *proportion* of true trustors among Players A. However, in our within subject design, we will not consider isolating trustworthiness from altruism; in part, because we are concerned about prohibitively reducing our sample size.

[Insert Figure 3: About here]

C. The public goods game

Many students of social capital emphasize the importance of cooperation and its link to both trust (putting oneself in a vulnerable position) and trustworthiness (the decision not to exploit others' vulnerability); indeed, without trust and trustworthiness, there cannot be cooperation. However, experimental work on social capital has largely ignored cooperation. Two notable exceptions are Gachter et al. (2004) and Karlan (2005). Both of these authors provide experimental evidence on cooperative actions and then compare those actions to

subjects' socio-demographic characteristics and to their responses to survey questions regarding trust attitudes and behaviors.

In a public goods game, players simultaneously decide how much of an initial endowment they would like to invest into a public project. The marginal return from investing in the public project is lower than the marginal return from not investing; however, the aggregate amount invested benefits all the players participating in the game. We endowed each subject with 10 dollars. Subjects could keep or contribute any amount between \$0 and \$10; most subjects contributed integer amounts. Keeping a dollar was like contributing to a private fund with a constant marginal return equal to 1, whereas contributing to the group fund had constant marginal return equal to 0.5. Thus, the payoff function for each subject, *i*, was equal to the following expression:

$$\Pi_i = (10 - c_i) + 0.5\sum_{j=1}^{3} c_j$$

Where Π_i and c_i represented subject *i*'s payoff and contribution to the group fund, respectively with *i* and *j* =1, 2, or 3. In this game, it is a dominant strategy to contribute nothing to the group fund, as an additional 0.5 dollars are earned for every dollar one excludes from the group fund. It requires both trust and being trustworthy to cooperate and not to free ride. Figure 4 depicts the cumulative contributions of Players A and Players B. Our pattern of contributions for both players resemble those of many other authors, including Gachter et al., who have conducted one-shot public good games (see also Camerer, 2003). The pattern highlights important individual differences in contribution amounts (see Ledyard, 1995).

[Insert Figure 4: About here]

A description of all the behavioral/game variables (i.e., amounts passed and fractions returned in the triadic design (investment, dictator, and modified dictator), decisions in the binary trust game, and amounts contributed in the public goods game); their means and standard deviations can be found in Table 4.

[Insert Table 4: About here]

3.2 Surveys

In this experiment surveys served two different purposes: to extract demographic, behavioral, and attitudinal information about our subjects, and to provide a break between games. Rather than conduct one large survey at the beginning or end of each session, we divided our questions into three parts and administered them at various points throughout the sessions. The first survey (Survey A) contained primarily demographic information that we later used as control variables for our models. Here, we obtained data such as gender, year in school, race, number of siblings, frequency of church attendance, and number of alcoholic beverages consumed in a week; the answers to this last question provide a proxy for the level of social interactions of our participants. We also asked subjects how many other people they knew in the lab. The modal number of people that the subjects knew in the room was 0. The numbers ranged from 0 to 4, with 75% of the subjects knowing at most one other person in the room, and only 3 out of 129 subjects knowing 4 other people in the room. Thus, it is safe to say that the games were played among strangers. About 44% of our 129 subjects were male; 26% were either freshmen or sophomores; 31% were juniors, 33% were seniors, and 10% were graduate students. While 43% of our subjects were white, the rest were from different races, including

Black, Hispanic, and Asian. About 38% had one sibling, 12% were only children, and 50% had two or more siblings. The description of the variables, mean values and standard deviations can be found in Table 4.

In our sample, males were younger than females, and drank more alcohol; non-whites drank less alcohol, had more siblings, and attended a place of worship more often than whites. Table 5 shows the pair wise correlations of the abovementioned variables. We also added the variable "membership" to Table 5, which was formed by combining answers to the second survey that we administered (Survey B). In this survey, we solicited information about subjects' level of involvement (member, active member, or on the board) in organizations such as sports teams, social clubs, political parties, etc. The membership variable is considered important by several authors including Putnam (1995), who associate trust with social interactions. In our surveys, organizational membership is a proxy for social interactions. The description of this variable, mean level of membership involvement, and standard deviation can also be found in Table 4.

[Insert Table 5: About here]

Finally, in the third survey (Survey C), which was administered after all games in half of the sessions, and before all games in the rest to control for order effects, we gathered the bulk of attitudinal data about our subjects. Here, we included the GSS trust, fair, and help questions, as well as the trust stranger question, which asked people to agree or disagree with the statement, *"You can't count on strangers anymore."* As in Glaeser et al. and in Gachter et al., we also obtained behavioral information about trust and honesty. The questions included how frequently

subjects lend money or personal possessions and how often they tell lies. With the answers to the lending questions, we formed a behavior index by normalizing the sum of responses to single questions. Based on the sum of responses to questions about lying, we formed an honesty index. Finally, to be consistent with others, we also asked subjects whether they considered themselves trustworthy. Table 4 provides a description of these survey variables.[21]

4. Experimental procedures

This experiment was conducted in a dedicated experimental lab at Emory University. We recruited student subjects by making announcements in classes and via postings on a University-wide electronic bulletin board.[22] We report data from a total of 129[23] subjects who participated in our experiment. Each subject participated in one of 12 sessions and was randomly assigned a role as Player A or Player B. All sessions lasted approximately 1.5 hours, and there were between 8 and 12 subjects in each session (inclusive). Earnings ranged from $0 to $40 plus a $3 show-up fee. Our sample included subjects who had not participated in economic experiments in the past.

Upon entering the lab, each subject chose a seat behind a closed partition. At the beginning of each session, the experimenters requested that subjects turn off their cell phones and remain quiet for the duration of the session. All instructions were distributed and then read aloud, and information was common to all subjects.[24] Each session consisted of the games

[21] Table A in the Appendix provides a summary of the correlations between pairs of survey measures of trust.
[22] Our recruiting form and all other subject materials, including instructions and surveys, are available upon request. Please send an e-mail to the corresponding author (mcapra@emory.edu).
[23] Three subjects were excluded because they were outliers; they provided implausible answers to some of the questions (e.g., excessive consumption of alcoholic beverages/week).
[24] There is one exception to this statement: in the modified dictator game, subjects do not know that their endowments are determined by other subjects' decisions made in the investment game.

mentioned above designed to measure trust and trustworthiness, a dominance solvable game (where subjects had to identify a dominant strategy and was unrelated to this project), the three survey sections mentioned above, and a written response section (where subjects were asked to write a comment and was unrelated to this project). The triadic trust game was divided into parts: the investment game, the dictator game, and the modified dictator game. The binary game was divided into the binary trust game and the binary dictator game. To the extent reasonable and possible, we altered the order of the game parts and surveys in each session in an effort to prevent order effects. Additionally, in half of the sessions we administered the third survey (Survey C) at the very beginning of the experiment, and in half of the sessions at the very end of the experiment.[25] Table 6 shows the order in which the games and surveys were presented in each of the twelve sessions.[26] Finally, after each decision, subjects were given a few minutes to explain their choices in writing.

[Insert Table 6: About here]

At the beginning of each game, the experimenter emphasized that subjects were being matched with a new player[27], which was pre-set by the experimenter, but random to the player. Subjects were also told that their decisions were going to be revealed only after all subjects

[25] As shown in Tables 1 and 2, some researchers have implemented the surveys before the games while others after the games. The general result that survey questions do not predict behavior in the investment game seems to be independent of the order in which the surveys were run and the amount of time that separated the implementation of surveys and games. In Glaeser, et al. (2000), for example, there was a two-week separation between the experiments and surveys.

[26] Because ours is a within-subject design, and the endowments for the modified dictator game are dependent on the investment game, the first always had to follow the latter (please refer to Table 6).

[27] As long as 12 people showed up to participate in the experiment, in the two player games, no one was matched with another more than once. When there were fewer than 12, repeat matching was necessary, but the individuals did not know at any time with whom they were matched. For the Public Goods game, we matched three players; all were either A or B.

completed all games and all surveys.[28] As we progressed through the experiment, the experimenter wrote the code name of each game on the white board at the front of the room and numbered the game in the order in which it was played during that session. Immediately following the final activity of the session, we privately told each subject the results of each game and instructed her to calculate her earnings for that game. Next, we asked for a volunteer subject to draw a numbered ping-pong ball from an envelope. The number ball that was selected corresponded to the game which would count towards subject earnings for that session. We gave each subject two copies of a receipt and instructed them to complete each copy. An experimenter then verified the accuracy of each subject's receipt, signed the receipt, and sent the subject to the back of the room to be paid in private by the other experimenter. Upon receiving payment, subjects left the session.

5. Results

The analysis of our data consists of several parts. First, we determine the correlation between the different games, all of which, in principle, should provide a measure of trust, as defined earlier. We then look at how the games correlate with measures of trust based on answers to survey questions. Finally, we see whether survey questions, either attitudinal or behavioral, can predict trusting and reciprocal actions as measured by choices in the above-mentioned games.

Table 7 provides a summary of the partial correlations between trusting actions in games. The following is noteworthy: the amounts that Players A contribute in the public goods game are correlated with the amounts they transfer in the investment game and with the decision to

[28] There were two exceptions to this rule: in the investment game and the binary trust game, Players B had to be informed of Players A decisions before being able to respond.

continue in the binary trust game (coef. = 0.216 and 0.331, respectively). On the other hand, when we control for altruism, we find that decisions in the investment game do not correlate with choices in the public goods games. As we observed in Section 3.1, it seems that choices in the investment games are partly motivated by altruism. With respect to the binary trust game, we observe that decisions in this game are correlated with choices in the investment game whether we add or not a control for altruism.

[Insert Table 7: About here]

Table 8 shows pairwise correlations between trusting actions in games and behavioral and attitudinal answers to survey questions. This table provides a rough picture of our general results. With respect to the survey questions and the investment game, we were largely able to replicate Glaeser et al.'s (p. 844), and Gachter et al.'s (p. 529) results. The *GSS trust* question is not correlated with the amount sent in the investment game or contributions in the public goods game. It doesn't correlate with the binary trust game either. The *GSS help*, on the other hand, correlates with trusting actions; the *GSS index*, which includes the trust, help and fair questions, also correlates with decisions in the binary and public goods game, but only weakly with decisions in the investment game. The variable *trust stranger* correlates with the binary game, but not with the investment game or the public goods game. The variable *honesty index* correlates with the investment game and the public goods game, and the variable *trustworthy* correlates with decisions in all games. Note that Glaeser et al. (2000) also have found that agreement with the statement *"I am trustworthy"* correlates with trusting actions. Finally, the variable *behavior index* does not correlate with any of the other behavioral trust measures.

[Insert Table 8: About here]

Others have found that the trust question and the GSS index correlate with trustworthiness as measured by the return ratio (amount sent back, *y*, divided by the amount received, *tx*). Using data from Players B, we confirm these results (see second row of Table 9). We find that the partial correlation coefficient between return ratios in the investment game and the trust question (*GSS trust*) is 0.287; the partial correlation between *y/tx* and the *GSS index* is 0.415. Trustworthiness is also highly correlated with the variable *trust strangers* (coef. = 0.409). In addition, we also find using Ordinary Least Square (OLS) regressions that the *GSS trust* and the *GSS index* predict return ratios. Those who disagree with the statement that most people cannot be trusted transferred back, on average, 17% more than those who agree with this statement (see Table C in the Appendix for regression results).[29] However, when we control for altruism by adding the proportion of the endowment sent in the modified dictator game as a control variable, we find that *GSS trust* does not correlate with trustworthiness. Interestingly, agreement with the statement *"I am trustworthy"* correlates with return ratios, but the coefficient is negative![30] This finding provides meaning to the statement *"never trust someone who says 'trust me'."*

[Insert Table 9: About here]

[29] In line with others' results, we also find that none of the subject specific variables (male, year, white, alcohol, siblings, church, and membership) predict trustworthiness in any of the trust games that we considered in this paper.
[30] OLS estimated coefficient for the variable I am "trustworthy" is -0.052 (robust se = 0.025; n = 54). Tables B and C in the Appendix contain the results of regressions with measures of trustworthiness as the dependent variable.

Summary statistics and initial analysis of our results from the triadic design in Section 3.1 suggest that altruism is a potential motive for transferring money in the investment game. Can attitudinal questions predict trusting behavior when we control for altruism using the triadic design? Table 10 contains the results of our regressions. We considered nine models; each model includes variables that other authors have previously identified as relevant in predicting trust. By comparing these nine models, we wanted to see which of the survey measures of trust give predicts trusting actions. Model 1 includes individual background characteristics described in Tables 4 and 5, and the choices in the dictator game, *altruism,* as control variables. Models 2 through 9 each contain, in addition to the above-mentioned variables, one variable that represents responses to attitudinal or behavioral questions in surveys. The first five variables (*GSS index, fair, help, trust, and trust strangers*) contain information about how much confidence subjects have in others. The other three variables (*behavior index, honesty index* and *trustworthy*) contain information about the behavior of the responder herself. All of these variables have been studied by previous authors.

[Insert Table 10: About here]

From the regression results, we find that three control variables: *male, membership,* and *altruism* are significant in virtually all models. Overall, males send on average over $2 less than females. In addition, the Emory students who are more deeply involved in organizations send more money. Finally, students who are more altruistic are also more trusting.

The attitudinal survey questions do well at predicting trusting actions. Those who agree with the statement that one cannot rely on strangers send 57 cents less than those who disagree

with it. Those who believe that most people can be helpful and fair send more than their counterparts (1.51 and 1.78 dollars more, respectively). Finally, although the trust question does not predict trusting behavior, the *GSS index*, which includes trust, fair and help, does; and does well. A one standard deviation increase in the *GSS index* increases the level of trust by almost one dollar. On the other hand, questions that rely on self-assessment (behavior index and trustworthy) do not perform well at predicting behavior in this game. These results are in stark contrast to what we observe when we do not control for altruistic preferences.

Table 11 shows the same models as in Table 10, but we do not have a control for altruism. Again, men send, on average about $2 less than women. Also, the membership variable is consistently predictive of trusting actions. Those who are more deeply involved in organizations send more money.[31] As others have found, however, we find that neither the *GSS trust* nor the *GSS index* are good predictors of trusting actions in this game (see Models 6 and 9, respectively), and the trust question has a negative coefficient (although not statistically different from zero). The only variable that predicts trusting actions is the *honesty index* (Model 3). This question, unlike the attitudinal questions, requests an assessment about the responder herself, not about how she sees others. In fact, the honesty index, to a degree, is a measure of how "good" the person thinks she is. In this game, it is reasonable to suggest that people who are nice or see themselves as nice also tend to transfer more money, as they may be motivated, in part, by altruism. The important result, however, is that if we had uniquely studied the investment game (i.e., Berg et al.'s game) perhaps we would have inferred (like others) that attitudinal survey questions do not predict trusting behavior.

[31] These results are in contrast to Glaeser, et al. (2000), who do not observe much evidence that demographic characteristics predict trusting behavior. In addition, Glaeser, et. al. find that the subjects who disagree with the statement *"you can't count on strangers anymore"* are more trusting, and they find a weak correlation between behavioral survey questions about trust and trusting actions.

[Insert Table 11: About here]

Now we turn to the binary trust game of Figure 1. Probit regressions, shown in Table 12, suggest that the variables *behavior index* (see Model 4) and *trust strangers* (see Model 5) are very good predictors of choices in this game. Those who lend more money and possessions to others are more likely to choose continue (trust = continue / not trust = stop). Those who say they trust strangers are also more likely to choose continue. More specifically, when subjects do not agree or disagree (i.e., neutral) with the statement "*you can't count on strangers anymore*", the predicted probability of choosing to continue (i.e., trust) is 0.60; in contrast, when they generally disagree with the abovementioned statement, the predicted probability of trusting goes up to 0.98. In Models 4 and 5, which are the best models at explaining variations in choices, the predicted probabilities of trusting are around 0.23 and 0.21, respectively, if the subject is male, but 0.66 and 0.64, respectively, if the subject is female. Interestingly, in Models 4 and 5, those subjects who drink more alcoholic beverages are *less* likely to choose continue. In contrast, the variable *membership*, which measures degree of socialization, does not appear in these or any of the models as being predictive of trusting actions. Finally, as shown in Model 9, people who are more confident in others, as measured by the *GSS index*, are more likely to choose continue.

[Insert Table 12: About here]

Gachter et al. (2004) found that the socio-economic differences among subjects are unrelated to contribution levels in the public goods game. In addition, they found that responses

to the trust question (*GSS trust*) do not predict cooperative behavior. In line with their findings, we find that the responder characteristics and most of the survey responses do not predict behavior in this game. As shown in Table 13, and consistent with Gachter et al.'s findings, we find that the *GSS index* and the *GSS help* variables are predictive of cooperative behavior. Unsurprisingly, the subjects who agree with the statement that "*most people try to be helpful"* contribute more than those who disagree with the statement. It seems that those who contribute do so mainly because they believe others are helpful and will contribute. Indeed, conditional cooperation is widely thought to explain much of the contributions in public goods games (see Fishbacher et al., 2001).

Interestingly, in the trust games we studied, subject characteristics, such as sex and level of socialization proxied by membership involvement in organizations (which measures social interactions) are important determinants of trust. In contrast, in the public goods game, these variables are generally unrelated to contributions. We find, however, that attendance to a place of worship (the c*hurch* variable) is positively correlated with contributions in some of the models.

[Insert Table 13: About here]

6. Discussion

We now return to the initial question that we posed in the introduction: can we reliably ascertain that survey questions do not predict trusting actions in games? We find that, unfortunately, the answer to this question depends on the game used to obtain a behavioral measure of trust. Different variables predict trusting actions in different games. Most notably,

none of the attitudinal questions are good predictors of trusting actions in the well-known investment game. In contrast, all attitudinal questions except *GSS trust* are good predictors of trusting behavior when we control for altruism. If we take the point of view that the triadic design can be used to isolate trust from altruistic motives, attitudinal questions should not be ignored.

Others, who have also conducted similar experiments, have found that the trust question and the *GSS index* do not predict trusting actions in the investment game. Our data support these results. In addition, like others, we find that the trust question (*GSS trust*) and the *GSS index* are both good predictors of trustworthiness. Interestingly, when we control for other-regarding motives for transferring money, agreement with the statement *"I am trustworthy"* is a predictor of trustworthiness. The more one agrees with the statement, the less reciprocal one is. With respect to the binary trust game, we find that some attitudinal questions like the *GSS index* and the *GSS help* questions are good predictors of trusting actions. These same variables can also predict cooperative behavior as measured by voluntary contributions in a public goods game. Table 14 summarizes the results of our regressions.

[Insert Table 14: About here]

Our results add doubt to the consensus that seems to have emerged among experimental economists that attitudinal survey questions are bad predictors of trusting actions. Clearly, the *GSS index* does correlate with trusting actions. These results seem intuitive. Indeed, if we go back to the definition of trust (Section 2 of this paper), we will see that the decision to voluntarily put resources at the disposal of another without a commitment depends on the degree

of confidence one has in others. The questions that form the *GSS* index –trust, fair, and help–ask about how much confidence one has in others.[32]

What is the general implication of our findings? Having an adequate measurement of a society's level of trust is important because trust is a proxy for social capital, and social capital is thought to be a determinant of economic growth. In addition, the WVS and the GSS have been collecting responses to survey trust questions for a long time, and these data are publicly available. We do not find evidence to argue that the widely used attitudinal GSS questions should be changed; however, the widely used WVS should probably be adjusted to include the help question so that researchers who access the WVS data could form an index similar to the *GSS index*. Unlike others, based on our findings, we do not believe that behavioral survey questions are more reliable predictors of trusting actions. These questions do not ask subjects to form an assessment of others, which lies at the heart of trusting.

Although our results are generally quite strong, we do have some concerns that are worth mentioning in the discussion. In an interesting study recently published in the *American Economic Review*, Karlan (2005) links survey responses to *GSS trust*, *GSS fair*, and *GSS help* questions to choices in a variation of the trust game[33], and to real life decisions.[34] Karlan finds that, contrary to expectations, the sampled Peruvians who pass more in a 'trust' game, are less likely to save and more likely to default on a loan. His explanation for this surprising result is that the trust game is measuring risk attitude, not trust. In other words, those borrowers who tend

[32] Indeed, in a recent study, Ashraf et al (2006) find that elicited expectations of trustworthiness (i.e., expectations about how much the second mover will return to the first mover) can explain trusting actions.
[33] The first player is allowed to pass zero, one, two, or three coins, and the experimenter matches the amount passed before allowing the second player to make a move.
[34] Karlan assumes that saving in a micro credit program is a 'real-life' measure of trusting actions because each dollar, peso or sol that an individual saves can be lost, if others default (see how this is consistent with the definition of trust explained in Section 2), but there is a possibility of mutual gains, if they do not default. Similarly, a 'real-life' measure of trustworthiness is repayment of the loan. On the other hand, a well-known disadvantage of field experiments is the lack of control of relevant variables that may affect the "real life" investment/default decisions.

to pass more are also more "irresponsible." However, it could also be that the game Karlan used to measure trust is not providing a good measure of trust. For instance, in Karlan's experiments, indigenous people were passed more than Westerners, which may be due to altruistic motives.

However, even if we ignore the results from the experiment, Karlan also finds that the GSS questions (trust, fair and help) are not predictive of savings in the micro-financing program he studies, but they are highly predictive of default rates. Without further research, we cannot at this point reconcile his finding with ours. However, we can indeed say that more experiments that control for other regarding preferences, and more field studies that correlate survey questions with "real life" decisions need to be performed before we can with some confidence say "attitudinal questions do not predict trust." Meanwhile, a broader implication of our study is a cautionary one. We believe that people who run trust games in the field should be more careful about the implementation of the games and should always run games together with survey questions, particularly if they want to be able to compare their results with those obtained by others. Survey questions *may*, after all, represent a more practical, homogeneous, and reliable measure of trust than certain trust games.

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Figures

Figure 1: The binary trust game, with parameters r < s < t < u

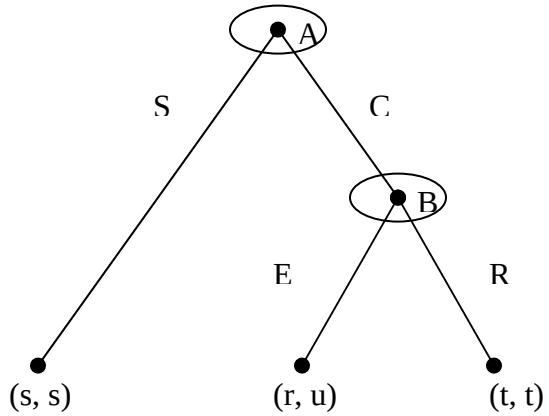


Figure 2: Comparison with Cox, 2004

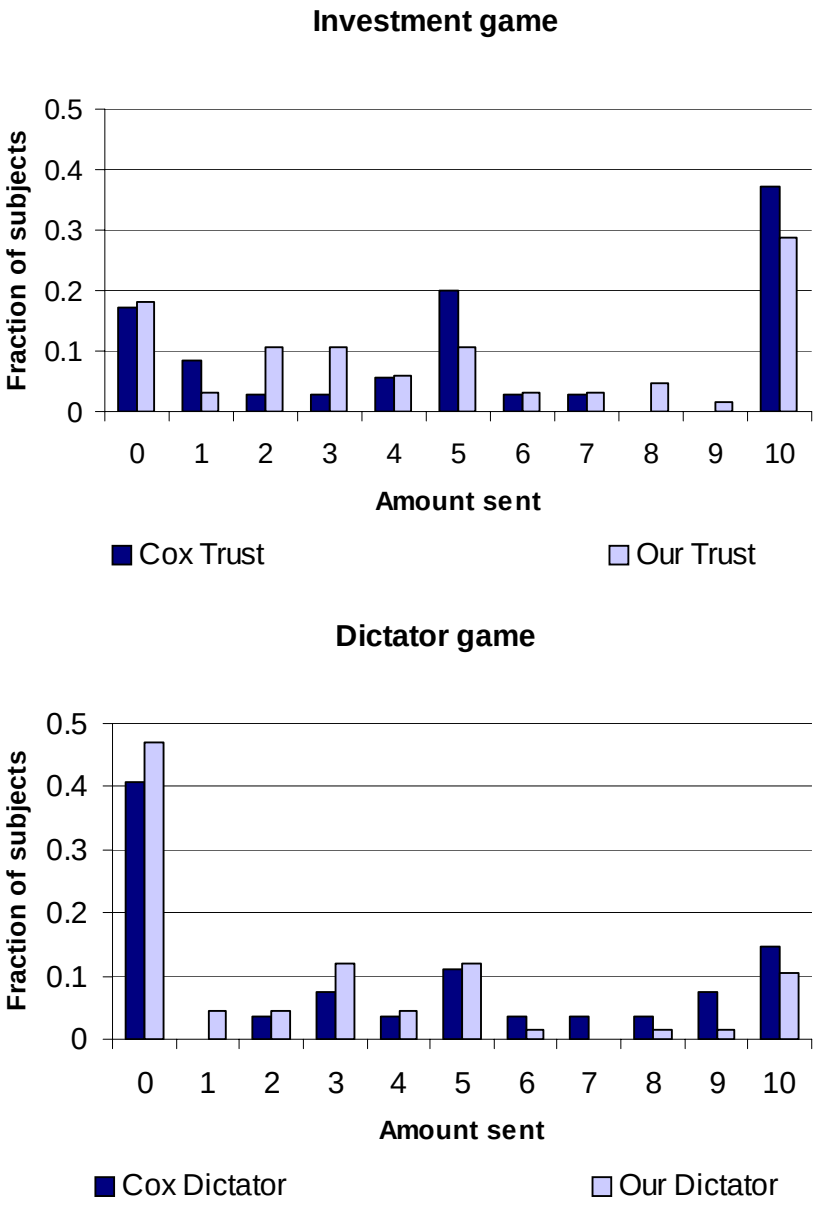


Figure 3: The Dictator game of McCabe, Rigdon and Smith (2001) with r<s<t<u

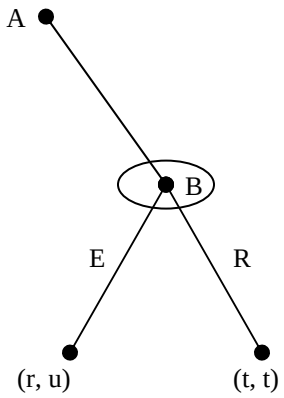
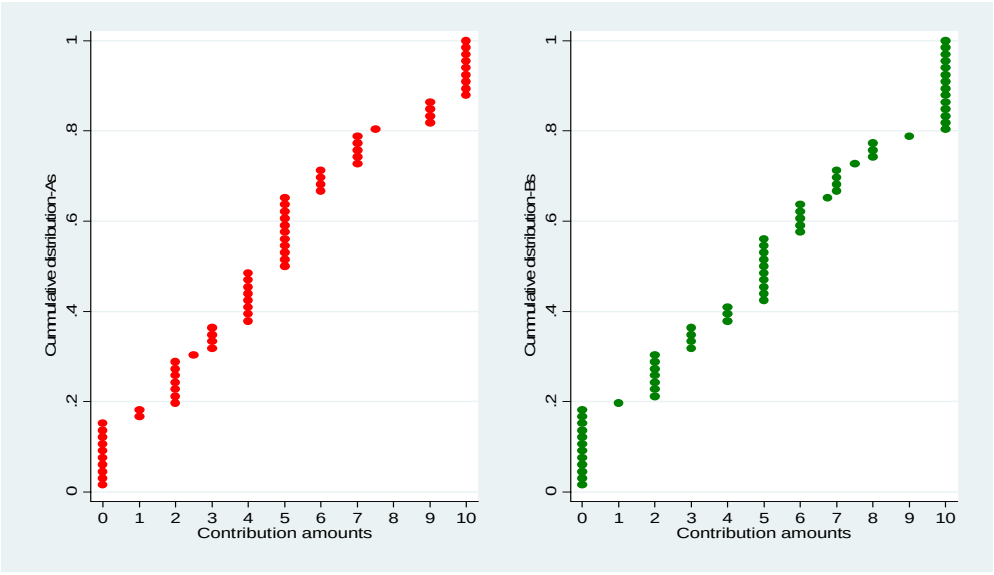


Figure 4: Cumulative distribution of contribution amounts in the Public Goods game



Tables

Table 1: Details of Trust Games Played in Developing Countries

Study	Country	Students?	Fraction of As Sending Zero	Fraction Sent	Fraction Returned	Return Ratio	Double Blind?	Strategy Method?	Equal Endowments?	Included Survey?[1]
Ashraf et al. (2006)[2]	Russia	X	0.10	0.49	0.29	0.80		X		Yes
	South Africa	X	0.11	0.43	0.27	0.73		X		Yes
Bahry and Wilson (2004)[3]	Russia		0.03	0.51	0.40	1.19				Yes[4]
Barr (2003)[5]	Zimbabwe		0.09	0.43	0.43	1.28			X	
Buchan et al. (2006)[6]	China	X	0.00	0.71	0.51[7]	1.52	X		X	
	Japan	X	0.05	0.69	0.47[7]	1.42	X		X	
	South Korea	X	0.04	0.67	0.44[7]	1.33	X		X	
Burns (2006)	South Africa	High School	N/A	0.33	0.23	0.69			X	Yes
Cardenas (2003)	Colombia	X	0.01	0.50	0.39	1.18			X	
Carter & Castillo (2003)[3,8,9]	South Africa		N/A	0.53	0.38	1.14				
Carter & Castillo (2005)	Honduras		0.04	0.49	0.42	1.26	X			
Danielson & Holm (2007)[10]	Tanzania		0.00	0.56	0.46	1.38		X	X	GSS
Ensminger (2000)	Kenya		0.00	0.44	0.18	0.54				Yes
Fehr & List (2004)[11]	Costa Rica	X	N/A	0.40	0.32	0.95			X	
	Costa Rica		0.00	0.59	0.44	1.32			X	
Greig & Bohnet (2008)[7, 12]	Kenya		0.13	0.30	0.41	0.82			X	Yes
Haile et al. (2006)[8, 3, 9, 7]	South Africa	X	0.04	0.55	N/A[13]	N/A[13]		X	X	
Holm & Danielson (2005)	Tanzania	X	0.02	0.53	0.37	1.11			X	GSS[14]
	Sweden	X	0.05	0.51	0.35	1.05			X	GSS[14]
Johansson-Stenman et al. (2005)[15]	Bangladesh		0.07	0.46	0.48	1.45	X			GSS[16]
Karlan (2005)[12, 5]	Peru		0.23	0.46	0.43	1.11			X	GSS [14,16]
Koford (2003)	Bulgaria	X	0.06	0.61	0.42	1.27	X		X	
Lazzarini et al. (2004)[12, 17]	Brazil (Anonymous)	X	N/A	0.56	0.40	0.80	X			GSS[16]
	Brazil (Face to Face)	X	N/A	0.86	0.50	1.00				GSS[16]
Mosley & Verschoor (2005)[5]	Uganda		0.07	0.49	0.33	0.99			X	
Schechter (2007)[8]	Paraguay		0.07	0.47	0.43	1.30		X	N/A	

1. "GSS" means that the GSS questions were in the survey. "Yes" means a Trust-related survey was conducted, but it is not apparent that GSS questions were included.
2. Some of these values are taken from Cardenas and Carpenter (2008). Subjects were paid via random choice method.
3. Bs were asked to predict the amount they would receive before being shown the transfer amount.
4. Survey was administered days or weeks before games were played.
5. Although this game was not binary, subjects did have a limited strategy space.
6. Subjects in these experiments participated in pre-game, non-strategy related, discussion.
7. This figure differs from that reported by author(s), because the author(s) allow Bs to return from total wealth, not only from amount transferred.
8. Subjects played both roles.
9. As were asked to anticipate what they would receive in return.
10. Experiment was administered using a "take-home" packet.
11. Experiment also included a "Trust with Punishment" treatment (which was sometimes played before the Investment Game). As told Bs what they would like to receive in return
12. These experimenters multiplied A's transfer by 2. All others multiplied A's transfer by 3.
13. Comparable amount cannot be calculated for table. This experiment used the strategy method, thus responses from subjects receiving zero were also obtained.
14. Survey took place after the game.
15. Subjects were household heads and they knew each other's religious identity.
16. Survey took place before the game.
17. Half of the Bs could give a non-binding promise.

Table 2: Details of Investment Games Played in the United States with Student Subjects

Study	Proportion of As Sending Zero	Fraction Sent	Fraction Returned *y/tx*	Return Ratio *y/x*	Double Blind?	Strategy Method?	Multiplication of Transfer	Endowment For Both?	Combined with Survey?
Berg et al. (1995)	0.06	0.52	0.30	0.90	Yes	No	3x	Yes	No
Ashraf et al. (2006)[1]	0.09	0.41	0.23	0.58	No	Yes	3x	No	Before, Not GSS
Buchan et al. (2006)[2]	0.05	0.65	0.43[3]	1.28	Yes	No	3x	Yes	No
Burks et al. (2003)[4]	0.14	0.65	0.44	1.31	Yes	No	3x	Yes	No
Cox (2004)	0.19	0.60	0.28	0.83	Yes	No	3x	Yes	No
Glaeser et al. (2000)[5]	0.04	0.83	0.46	0.99	No	No	2x	No	Weeks before, GSS
Ortmann et al. (2000)[6]	0.19	0.44	0.21	0.62	Yes	No	3x	Yes	No

1. Some of these values are taken from Cardenas and Carpenter (2008). Subjects were paid via random choice method.
2. Subjects participated in pre-game, non-strategy related discussion among all participants. They knew whether or not their partner was in their discussion group, but did not know the identity of their partner.
3. This figure differs from Buchan et al. (2006) because they include the second-mover's endowment in the amount of money available to send back.
4. Burks et al. (2003) perform a sensitivity check of the BDM game, they also have control sessions, which are the data reported here.
5. Endowment was $15, not the standard $10. Subjects knew the identity of the subject with whom they were paired.6. In an effort to re-examine the Investment Game, Ortmann et al. (2000) replicated the BDM version before adding treatments which included social history and a questionnaire regarding subject's expectations regarding game outcomes. This is data from their control treatment.

Table 3: Comparison of Results for the Triadic Design, mean amount passed (std)

Game	Cox Data	Our Data	H_o : diff. in row means = 0
Investment (first movers)	5.97 (3.87) n=32	5.03 (3.77) n=63	t=-1.135; p=0.130; two-tailed
Dictator	3.63 (3.86) n=30	*2.68 (3.32) n=63	t=-1.226; p = 0.112; two-tailed
H_o : diff. in col. means = 0	t-test; p=0.010; one-tailed	p=0.000; one-tailed	
Investment (second movers)	4.94 (6.63) n=32	5.94 (6.06), n=54	t=0.719; p = 0.474; two-tailed
Modified Dictator	2.06 (3.69) n= 32	**5.24 (6.15), n=54	t=2.243; p=0.014; two-tailed
H_o : diff. in col. means = 0	t-test; p=0.018; one-tailed	p=0.169; one-tailed	

* On average, people sent about 27%, and ** 28% of the amount available for transfer.

Table 4: Description of Variables – Mean and Std for Player As, Bs, and all

Task	Variable Name	Description / range of values	Mean (Std) As	Mean (Std) Bs	Mean (Std) all
Games	Investment	Amount passed in the trust game. Maximum is 10, minimum is 0	5.03 (3.77)		
	Dictator	Amount passed by As in the dictator game. Maximum is10, minimum is 0	2.68 (3.32)		
	Binary trust	Continue or Stop the game for As. Dummy variable: 1 continue, 0 stop	0.49 (0.50)		
	Public goods	Amount contributed to a public project. Values allowed range between 0 and 10	4.68 (3.31)	5.06 (3.55)	4.88 (3.43)
	Trustworthy	Fraction returned from available amount, 3x. Can be between 0 and 1		0.29 (0.24)	
	Mod. dictator	Amount passed by Bs in the modified dictator game. Can be between 0 and 30.		5.24 (6.15)	
	Binary tworthy	Exploit or Reciprocate. Dummy variable: 1 reciprocate, 0 exploit		0.41 (0.50)	
Survey A	Male	Sex of the student subject. Dummy: 1 Male, 0 Female	0.40 (0.49)	0.48 (0.50)	0.44 (0.50)
	Year	Year of education in college. Values range from 1: "Freshman," 2: "Sophomore," 3: "Junior," 4: Senior," and 5: "Graduate"	3.21 (1.15)	3.06 (1.09)	3.13 (1.12)
	White	Race of the student subject. Dummy: 1 White , 0 Other	0.46 (0.50)	0.39 (0..49)	0.43 (0.50)
	Alcohol	Number of alcoholic drinks consumed per week. Positive integer number.	4.14 (5.92)	4.25 (6.09)	4.20 (5.00)
	Siblings	Number of siblings. Positive integer number.	1.68 (1.29)	1.71 (1.15)	1.70 (1.22)
	Church	Answers to the question "How often do you go to church or other place of worship?" Answers are, 0: "Never," 1: "Sometimes," 2: "At least once a week."	0.89 (0.72)	0.91 (0.63)	0.90 (0.67)
Survey B	Membership	Sum of degree of involvement in associations variables. Values range from 0: "None," 1: "Member," 2: "Active member," to 3: "On the board". Values ranged from 0 to 12	5.52 (2.59)	5.92 (3.42)	5.73 (3.04)
Survey C	GSS Trust	Answers to the question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Answers are, 1: "Can't be too careful"; 2: "Most people can be trusted"	1.27 (0.45)	1.32 (0.47)	1.30 (0.46)
	GSS Fair	Answers to the question "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?" Answers are, 1: "Would take advantage of you"; 2: "Would try to be fair"	1.26 (0.44)	1.45 (0.50)	1.49 (0.50)
	GSS Help	"Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves" Answers are, 1: "Just look out for themselves"; 2: "Try to be helpful"	1.40 (0.49)	1.41 (0.50)	1.41 (0.49)
	GSS Index	Normalized sum of de-meaned and normalized data from *GSS Trust*, *GSS Fair*, and *GSS Help*	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)
	Trust stranger	Disapproval or approval of the statement, "You can't count on strangers any more." Answers range from 3: "Strongly agree" to -3: "Strongly disagree". This variable was resigned for the analysis.	-0.39 (1.36)	-0.15 (1.50)	-0.12 (1.46)
	Behavior Index	Normalized sum of responses to three questions related to the frequency of leaving the door unlocked, lending money and lending possessions. Answers are positive real numbers.	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)
	Honesty Index	Sum of responses to five questions related to the frequency of lying to parents, roommates, acquaintances, close friends and partners. Answers range from 1: very frequently, to 5: never.	3.91 (0.49)	3.80 (0.52)	3.85 (0.50)
	Trustworthy	Approval or disapproval of the statement, "I am trustworthy." Answers range from 3: "Strongly agree" to -3: "Strongly disagree"	2.16 (0.81)	2.11 (1.07)	2.13 (0.95)

Table 5: Correlations between pairs of demographic variables – all subjects (n =129)

	Male	Year	White	Alcohol	Siblings	Church	Membership
Male	1.000	-0.441 (0.000)	0.054 (0.546)	0.224 (0.011)	-0.100 (0.259)	-0.006 (0.947)	0.002 (0.979)
Year		1.000	0.067 (0.453)	0.061 (0.491)	0.012 (0.890)	0.111 (0.209)	-0.035 (0.691)
White			1.000	0.362 (0.000)	-0.173 (0.050)	-0.198 (0.024)	-0.032 (0.723)
Alcohol				1.000	-0.045 (0.610)	-0.151 (0.087)	-0.024 (0.785)
Siblings					1.000	0.211 (0.016)	-0.039 (0.658)
Church						1.000	0.128 (0.148)
Membership							1.000

Notes: n = 129; Significance levels in parentheses

Table 6: Order of Games and Surveys

	Session											
	1	2	3	4	5	6	7	8	9	10	11	12
Task	PG	SC	BD	SC	PG	SC	BD	SC	PG	SC	DG	SC
	DG	PG	SA	BD	BD	PG	DG	BD	DG	PG	PG	DG
	BD	DG	DG	SA	TG	BD	PG	DG	BD	DG	BD	PG
	SB	BD	PG	DG	X	TG	TG	PG	SA	BD	SB	BD
	TG	SB	TG	PG	MD	X	SA	TG	TG	SA	TG	SB
	X	TG	X	TG	SA	MD	X	SA	X	TG	X	TG
	BT	X	CC	X	DG	SA	MD	X	BT	X	BT	X
	SA	BT	SB	CC	SB	DG	SB	MD	SB	BT	SA	BT
	TG	SA	BT	SB	BG	SB	BT	SB	TG	SB	MD	SA
	W	TG	W	BT	W	BG	W	BT	W	TG	W	MD
	SC	W	SC	W	SC	W	SC	W	SC	W	SC	W

Trust Game = TG; Dictator Game = DG; Modified Dictator = MD; Binary Trust = BT; Binary Dictator = BD; Public Goods Game = PG; Survey A = SA; Survey B = SB; Survey C = SC; P-Beauty = X; Written response = W

Table 7: Partial correlations between trusting actions in different games – Players A

	Investment Game	Binary Trust Game	Public Goods Game
Investment Game[§] (triadic)		0.282* (0.037)	0.186 (0.173)
Investment Game	1.000	0.314* (0.018)	0.216* (0.100)
Binary Trust Game		1.000	0.331* (0.013)
Public Goods Game			1.000

Notes: Significance levels in parentheses. § = a control is added for altruism
* = significant at the 10% level or lower. n = 63

Table 8: Correlations between trusting actions in games and responses in surveys

	GSS Trust	GSS Help	GSS Fair	GSS Index	Trust Stranger	Behavior Index	Honesty Index	Trustworthy
Investment Game	0.038 (0.772)	0.266* (0.037)	0.039 (0.764)	0.219 (0.088)	0.182 (0.154)	-0.115 (0.369)	0.300* (0.017)	0.306* (0.015)
Binary Trust Game	0.181 (0.160)	0.230 (0.072)	0.147 (0.253)	0.318* (0.012)	0.500* (0.000)	0.149 (0.244)	0.083 (0.519)	0.320* (0.011)
Public Goods Game	0.139 (0.282)	0.290* (0.022)	0.010 (0.938)	0.253* (0.047)	0.182 (0.152)	0.085 (0.510)	0.289* (0.022)	0.273* (0.031)

Notes: Significance levels in parentheses, * = significance at the 5% level or lower. n = 63

Table 9: Partial correlations between return ratios (trustworthiness) and responses in surveys

	GSS Trust	GSS Index	Trust Stranger	Behavior Index	Honesty Index	T-worthy
Investment Game[§] Return ratio (triadic)	0.204 (0.233)	0.385* (0.020)	0.163 (0.342)	0.011 (0.950)	-0.146 (0.394)	-0.302* (0.073)
Investment Game Return ratio	0.287* (0.050)	0.415* (0.004)	0.409* (0.004)	0.066 (0.659)	-0.074 (0.622)	-0.171 (0.249)

Notes: Significance levels in parentheses, * = significance at the 10% level or lower. n = 44 for Triadic Game, and n = 54 for Investment Game, § = a control is added for altruism

Table 10: Investment Game as a function of trust attitudes and sender characteristics (controlling for Altruism)

	Dependent Variable: Amount sent								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.934**
									(0.406)
GSS Fair								1.783*	
								(0.979)	
GSS Help							1.512*		
							(0.837)		
GSS Trust						0.887			
						(0.923)			
Trust Strangers					0.574*				
					(0.292)				
Behavior Index				-0.166					
				(0.445)					
Honesty Index			2.017**						
			(0.806)						
Trustworthy		0.445							
		(0.568)							
Male	-2.268**	-1.993**	-1.927**	-2.252**	-1.958**	-2.463**	-2.411**	-2.025**	-2.280**
	(0.924)	(0.992)	(0.893)	(0.933)	(0.914)	(0.943)	(0.921)	(0.945)	(0.907)
Year	0.230	0.361	0.418	-0.204	0.324	0.181	0.086	0.493	0.136
	(0.394)	(0.429)	(0.384)	(0.404)	(0.387)	(0.398)	(0.394)	(0.415)	(0.382)
White	0.000	-0.099	-0.258	-0.006	-0.304	0.088	-0.176	0.285	-0.194
	(0.833)	(0.845)	(0.802)	(0.840)	(0.826)	(0.852)	(0.850)	(0.836)	(0.830)
Alcohol	0.073	0.073	0.081	0.082	0.054	0.071	0.070	0.071	0.073
	(0.073)	(0.073)	(0.070)	(0.077)	(0.072)	(0.073)	(0.072)	(0.072)	(0.070)
Siblings	-0.070	-0.078	-0.180	-0.078	-0.060	-0.044	-0.035	0.044	-0.051
	(0.304)	(0.306)	(0.294)	(0.308)	(0.297)	(0.306)	(0.300)	(0.304)	(0.294)
Church	-0.481	-0.528	-0.818	-0.531	-0.713	-0.461	-0.386	-0.457	-0.464
	(0.569)	(0.574)	(0.559)	(0.589)	(0.567)	(0.575)	(0.562)	(0.562)	(0.552)
Membership	0.649***	0.611***	0.608***	0.643***	0.624***	0.664***	0.612***	0.672***	0.609***
	(0.160)	(0.168)	(0.154)	(0.162)	(0.156)	(0.168)	(0.168)	(0.163)	(0.164)
Altruism	0.386***	0.355***	0.369***	0.393***	0.415***	0.418***	0.415***	0.436***	0.467***
	(0.120)	(0.127)	(0.115)	(0.122)	(0.118)	(0.128)	(0.120)	(0.122)	(0.122)
Constant	0.816	-0.277	-6.973**	0.934	1.088	-0.383	-0.743	-3.008	1.138
	(1.593)	(2.122)	(3.463)	(1.637)	(1.558)	(1.887)	(1.745)	(2.514)	(1.590)
Adj R-squared	0.364	0.359	0.420	0.354	0.396	0.367	0.394	0.395	0.416
Numb. Obs.	63	63	63	63	63	62	62	62	62

Notes: OLS regression coefficients. Standard errors in parentheses. Data were resigned so that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level

Table 11: Investment Game as a function of trust attitudes and sender characteristics

	Dependent Variable: Amount sent								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.442 (0.431)
GSS Fair								0.881 (1.045)	
GSS Help							1.014 (0.906)		
GSS Trust						-0.103 (0.948)			
Trust Strangers					0.448 (0.319)				
Behavior Index				0.050 (0.477)					
Honesty Index			2.174** (0.871)						
Trustworthy		0.951 (0.572)							
Male	-2.031** (0.997)	-1.487 (1.034)	-1.675* (0.963)	-2.037** (1.007)	-1.777* (1.004)	-2.219** (1.023)	-2.210** (1.010)	-2.018* (1.044)	-2.140** (1.016)
Year	0.306 (0.426)	0.571 (0.449)	0.504 (0.415)	0.313 (0.436)	0.383 (0.426)	0.293 (0.431)	0.204 (0.432)	0.430 (0.458)	0.258 (0.427)
White	0.007 (0.901)	-0.205 (0.896)	-0.272 (0.868)	0.009 (0.909)	-0.230 (0.909)	0.191 (0.926)	-0.022 (0.933)	0.261 (0.923)	0.033 (0.928)
Alcohol	0.038 (0.078)	0.044 (0.077)	0.048 (0.075)	0.036 (0.082)	0.021 (0.078)	0.037 (0.079)	0.033 (0.078)	0.034 (0.078)	0.033 (0.078)
Siblings	-0.054 (0.329)	-0.074 (0.324)	-0.173 (0.318)	-0.052 (0.333)	-0.045 (0.326)	-0.026 (0.333)	-0.016 (0.329)	0.021 (0.336)	-0.025 (0.330)
Church	-0.481 (0.615)	-0.581 (0.609)	-0.844 (0.606)	-0.466 (0.637)	-0.662 (0.623)	-0.407 (0.625)	-0.383 (0.618)	-0.424 (0.620)	-0.427 (0.618)
Membership	0.745*** (0.170)	0.647*** (0.177)	0.696*** (0.164)	0.746*** (0.172)	0.731*** (0.169)	0.794*** (0.178)	0.748*** (0.180)	0.792*** (0.176)	0.767*** (0.178)
Constant	1.102 (1.721)	-1.283 (2.219)	-7.305* (3.749)	1.065 (1.772)	1.331 (1.713)	0.827 (2.013)	-0.116 (1.907)	-1.010 (2.708)	1.034 (1.782)
Adj R-squared	0.256	0.279	0.408	0.242	0.269	0.251	0.269	0.261	0.266
Numb. Obs.	63	63	63	63	63	62	62	62	62

Notes: OLS regression coefficients. Standard errors in parentheses. The data were resigned such that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level

Table 12: Binary Trust Game as a function of trust attitudes and sender characteristics

	Dependent Variable: Dummy for trust								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.439**
									(0.189)
GSS Fair								0.446	
								(0.450)	
GSS Help							0.670*		
							(0.389)		
GSS Trust						0.560			
						(0.403)			
Trust Strangers					0.982***				
					(0.267)				
Behavior Index				0.641***					
				(0.233)					
Honesty Index			0.066						
			(0.372)						
Trustworthy		0.551**							
		(0.275)							
Male	-0.961**	-0.737*	-0.954**	-1.163***	-1.148**	-0.961**	-0.954**	-0.825*	-0.885**
	(0.413)	(0.436)	(0.415)	(0.442)	(0.519)	(0.419)	(0.423)	(0.429)	(0.423)
Year	-0.044	0.094	-0.039	0.039	0.019	-0.049	-0.099	0.034	-0.061
	(0.169)	(0.184)	(0.172)	(0.181)	(0.216)	(0.170)	(0.177)	(0.188)	(0.174)
White	0.226	0.148	0.222	0.272	-0.142	0.197	0.080	0.231	0.076
	(0.369)	(0.381)	(0.369)	(0.394)	(0.455)	(0.379)	(0.386)	(0.374)	(0.389)
Alcohol	-0.051	-0.054	-0.051	-0.083**	-0.147**	-0.050	-0.053	-0.049	-0.052
	(0.038)	(0.039)	(0.038)	(0.040)	(0.063)	(0.037)	(0.038)	(0.037)	(0.037)
Siblings	-0.039	-0.048	-0.042	-0.019	0.029	-0.028	-0.028	-0.014	-0.024
	(0.129)	(0.131)	(0.130)	(0.136)	(0.162)	(0.130)	(0.130)	(0.131)	(0.133)
Church	0.151	0.106	0.041	0.315	-0.257	0.022	0.149	0.129	0.125
	(0.247)	(0.260)	(0.254)	(0.267)	(0.319)	(0.249)	(0.250)	(0.251)	(0.253)
Membership	0.074	0.033	0.073	0.090	0.073	0.057	0.035	0.067	0.033
	(0.072)	(0.076)	(0.072)	(0.071)	(0.092)	(0.075)	(0.075)	(0.074)	(0.075)
Constant	0.087	-1.327	-0.172	-0.215	1.125	-0.524	-0.383	-0.747	0.436
	(0.687)	(0.988)	(1.613)	(0.724)	(0.940)	(0.826)	(0.760)	(1.118)	(0.719)
Pseudo R-squared	0.140	0.192	0.140	0.241	0.422	0.154	0.163	0.140	0.193
Numb. Obs.	63	63	63	63	63	62	62	62	62

Notes: Probit regression coefficients. Standard errors in parentheses. Notes: The data were resigned such that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level

Table 13: Public Goods Game as a function of trust attitudes and sender characteristics

	Dependent Variable: Amount contributed								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.915**
									(0.433)
GSS Fair								0.186	
								(1.111)	
GSS Help							2.297**		
							(0.907)		
GSS Trust						1.322			
						(1.044)			
Trust Strangers					0.449				
					(0.352)				
Behavior Index				1.062**					
				(0.459)					
Honesty Index			1.495						
			(1.072)						
Trustworthy		0.748							
		(0.579)							
Male	-1.245	-0.816	-0.995	-1.381	-0.987	-1.471	-1.398	-1.378	-1.255
	(1.123)	(1.238)	(1.145)	(1.062)	(1.086)	(1.119)	(1.061)	(1.101)	(1.010)
Year	-0.295	-0.081	-0.148	-0.131	-0.219	-0.353	-0.505	-0.279	-0.372
	(0.487)	(0.503)	(0.494)	(0.471)	(0.465)	(0.459)	(0.450)	(0.514)	(0.446)
White	1.603	1.435	1.400	1.600	1.381	1.714*	1.328	1.791*	1.479
	(1.027)	(1.038)	(1.067)	(0.983)	(1.002)	(1.036)	(0.948)	(1.060)	(1.002)
Alcohol	-0.114	-0.109	-0.107	-0.163**	-0.131	-0.120	-0.122	-0.116	-0.122
	(0.084)	(0.086)	(0.083)	(0.075)	(0.085)	(0.082)	(0.084)	(0.083)	(0.084)
Siblings	0.259	0.244	0.174	0.313	0.267	0.293	0.312	0.295	0.288
	(0.319)	(0.318)	(0.307)	(0.292)	(0.289)	(0.314)	(0.313)	(0.322)	(0.290)
Church	0.917	0.840	0.675	1.239**	0.745	0.949*	1.054*	0.982*	0.968*
	(0.562)	(0.531)	(0.541)	(0.552)	(0.541)	(0.541)	(0.562)	(0.562)	(0.540)
Membership	0.235	0.155	0.197	0.260	0.224	0.265	0.185	0.280	0.233
	(0.201)	(0.225)	(0.201)	(0.186)	(0.201)	(0.218)	(0.194)	(0.220)	(0.211)
Constant	3.547*	1.669	-2.240	2.758	3.760**	1.827	1.253	2.819	3.775*
	(1.930)	(2.177)	(4.392)	(1.861)	(1.875)	(2.436)	(2.097)	(3.428)	(1.933)
Cox-Snell R-squared	0.144	0.163	0.175	0.203	0.167	0.176	0.229	0.154	0.205
Numb. Obs.	63	63	63	63	63	62	62	62	62

Notes: Tobit analysis with robust standard errors; standard errors in parentheses. The data were resigned such that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level

Table 14: Summary of relevant results from regressions (Trust = amount sent; T-worthy = return ratio)

		Investment Game (controlling for Altruism) (OLS)		Investment Game (OLS)		Binary Game (Probit)		Public Goods (Tobit)	
Survey Variable		Trust	T-worth	Trust	T-worth.	Trust	T-worth[†]	A	B
Attitudinal	GSS Index	+	+		+	+		+	+
	GSS Trust				+				
	GSS Fair	+	+		+				
	GSS Help	+				+		+	+
	Trust Stranger	+			+	+			
Behavioral	Behavior Index					+		+	+
	Honesty Index	+		+					
	I am T-worthy		–			+			

Notes: Here we report variables whose coefficients are significantly different from zero at the 90% level or higher. [†]Results not reported, as the models were bad fits and the number of observations is low.

APPENDIX

Table A: Correlations between different survey measures of trust

	GSS Trust	GSS Help	GSS Fair	GSS Index	Trust Stranger	Behavior Index	Honesty Index
GSS Trust	1.000	0.403* (0.000)	0.489* (0.000)	0.797* (0.000)	0.089 (0.320)	0.209* (0.018)	0.076 (0.392)
GSS Help		1.000	0.427* (0.000)	0.771* (0.000)	0.065 (0.469)	0.079 (0.375)	0.113 (0.205)
GSS Fair			1.000	0.807* (0.000)	0.004 (0.963)	0.069 (0.493)	0.222* (0.012)
GSS Index				1.000	0.630 (0.481)	0.147 (0.097)	0.173 (0.051)
Trust Stranger					1.000	0.093 (0.256)	-0.107 (0.227)
Behavior Index						1.000	-0.380 (0.668)

Notes: Significance levels in parentheses. * = significant at the 5% level or lower. n = 129

Table B: Investment Game as a function of trust attitudes and Player B characteristics (controlling for Altruism)

	Dependent variable: ratio of available funds returned								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.081**
									(0.035)
GSS Fair								0.186***	
								(0.061)	
GSS Help							0.104		
							(0.071)		
GSS Trust						0.113			
						(0.094)			
Trust Strangers					0.026				
					(0.027)				
Behavior Index				0.002					
				(0.038)					
Honesty Index			-0.052						
			(0.052)						
Trustworthy		-0.052**							
		(0.025)							
Male	0.022	-0.015	0.023	0.023	0.002	0.033	0.018	-0.002	0.017
	(0.082)	(0.079)	(0.082)	(0.087)	(0.077)	(0.087)	(0.077)	(0.077)	(0.077)
Year	-0.035	-0.037	-0.034	-0.034	-0.040	-0.046	-0.030	-0.044	-0.042
	(0.031)	(0.033)	(0.031)	(0.033)	(0.031)	(0.033)	(0.031)	(0.033)	(0.032)
White	0.100	0.050	0.106	0.010	0.106	0.077	0.081	0.045	0.052
	(0.084)	(0.084)	(0.086)	(0.085)	(0.086)	(0.078)	(0.078)	(0.078)	(0.076)
Alcohol	-0.003	-0.002	-0.004	-0.003	-0.005	-0.005	-0.004	-0.001	-0.004
	(0.005)	(0.006)	(0.006)	(0.007)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Siblings	0.018	0.001	0.018	0.018	0.009	0.014	0.024	0.003	0.014
	(0.034)	(0.029)	(0.034)	(0.035)	(0.032)	(0.033)	(0.034)	(0.030)	(0.030)
Church	0.079	0.076	0.078	0.079	0.073	0.100**	0.073	0.102**	0.097*
	(0.045)	(0.046)	(0.047)	(0.048)	(0.045)	(0.049)	(0.048)	(0.049)	(0.048)
Membership	0.006	0.005	0.004	0.006	0.004	0.004	0.004	0.011	0.006
	(0.009)	(0.010)	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)
Altruism	0.739***	0.752***	0.734***	0.738***	0.668***	0.680***	0.698***	0.623***	0.630***
	(0.142)	(0.134)	(0.140)	(0.143)	(0.162)	(0.136)	(0.135)	(0.145)	(0.137)
Constant	0.018	0.200	0.223	0.018	0.109	-0.069	-0.106	-0.179	0.100
	(0.197)	(0.193)	(0.242)	(0.199)	(0.188)	(0.219)	(0.219)	(0.187)	(0.189)
R-squared	0.525	0.569	0.536	0.525	0.538	0.545	0.557	0.624	0.596
Numb. Obs.	44	44	44	44	44	44	44	44	44

Notes: OLS regression coefficients. Robust standard errors in parentheses. Data were resigned so that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level

Table C. Trustworthy: Investment Game as a function of trust attitudes and Player B characteristics

	Dependent variable: ratio of available funds returned								
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GSS Index									0.102***
									(0.035)
GSS Fair								0.231***	
								(0.056)	
GSS Help							0.117		
							(0.073)		
GSS Trust						0.176*			
						(0.094)			
Trust Strangers					0.067***				
					(0.021)				
Behavior Index				0.018					
				(0.043)					
Honesty Index			-0.032						
			(0.067)						
Trustworthy		-0.040							
		(0.034)							
Male	-0.098	-0.132	-0.096	-0.094	-0.121	-0.065	-0.082	-0.084	-0.063
	(0.094)	(0.097)	(0.097)	(0.097)	(0.083)	(0.094)	(0.095)	(0.079)	(0.085)
Year	-0.009	-0.011	-0.007	-0.009	-0.034	-0.028	-0.007	-0.030	-0.025
	(0.038)	(0.038)	(0.039)	(0.037)	(0.031)	(0.033)	(0.035)	(0.029)	(0.029)
White	0.075	0.034	0.077	0.072	0.087	0.048	0.064	0.055	0.045
	(0.083)	(0.084)	(0.084)	(0.084)	(0.080)	(0.076)	(0.078)	(0.075)	(0.073)
Alcohol	-0.001	-0.001	-0.002	-0.003	-0.004	-0.005	-0.001	-0.002	-0.003
	(0.005)	(0.004)	(0.005)	(0.007)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Siblings	-0.019	-0.030	-0.018	-0.016	-0.026	-0.022	-0.020	-0.041	-0.030
	(0.033)	(0.028)	(0.034)	(0.035)	(0.030)	(0.034)	(0.033)	(0.029)	(0.031)
Church	0.076	0.073	0.075	0.071	0.058	0.098	0.068	0.101	0.091
	(0.065)	(0.066)	(0.066)	(0.066)	(0.061)	(0.062)	(0.066)	(0.061)	(0.061)
Membership	0.012	0.011	0.011	0.011	0.006	0.012	0.008	0.013	0.009
	(0.009)	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Constant	0.240	0.385	0.361	0.245	0.416**	0.067	0.099	-0.017	0.319*
	(0.225)	(0.244)	(0.275)	(0.222)	(0.196)	(0.250)	(0.267)	(0.213)	(0.188)
R-squared	0.109	0.136	0.114	0.113	0.259	0.183	0.162	0.313	0.263
Numb. Obs.	54	54	54	54	54	54	54	54	54

Notes: OLS regression coefficients. Robust standard errors in parentheses. Data were resigned so that a higher coefficient means more trust.

***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level