

Using Experimental Economics to Measure Social Capital and Predict Financial Decisions*

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Abstract: Questions remain as to whether results from experimental economics games are generalizable to real decisions in non-laboratory settings. Furthermore, important questions persist about whether social capital can help solve seemingly missing credit markets. I conduct two experiments, a Trust game and a Public Goods game, and a survey to measure social capital. I then examine whether behavior in the games predicts repayment of loans to a Peruvian group lending microfinance program. Since the structure of these loans relies heavily on social capital to enforce repayment, this is a relevant and important test of the games, as well as of other measures of social capital. I find that individuals identified as "trustworthy" by the Trust game are in fact less likely to default on their loans.

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I. INTRODUCTION

Economic theory suggests that market failures arise when contracts are difficult to enforce or observe. Social capital can help solve these failures. The more individuals trust each other, the more able they are to contract with each other¹. Hence, many believe trust is a critical input for both macro- and microeconomic outcomes. The trust game has become a popular tool, with many researchers conducting it in both university laboratories and field locations in developing countries. These studies have found that behaviors in the trust game correlate intuitively with individual attitudes and the relationships between players. However, these are not the outcomes of real interest, but rather proxies (or correlates) for the ability to overcome market failures and complete otherwise difficult to enforce contracts. This paper tests directly whether behavior in the trust game predicts such a real outcome, specifically the repayment of a loan in a setting with few if any legal enforcement mechanisms. I conduct the trust game with participants in a microcredit program in Peru, and I find that individuals identified as trustworthier are more likely to repay their loans.

The trust game is conducted between two players and an administrator, and purports to measure how much one player (A) trusts another player (B) and how trustworthy Player B is with respect to Player A. This paper puts these characterizations to a direct, real test; specifically I examine whether behavior in the game predicts real financial decisions made one year after playing the game. I conduct a similar test of a public goods game, as well as of an index created from questions identical to those in the General Social Survey and purported to measure general attitudes towards society.

Historically, experimental economics has limited itself to testing theories in a controlled, laboratory environment, where behavior in the game is the outcome of interest². Exceptions exist, but are limited. Binswanger {1980} and Binswanger and Sillers {1983} used hypothetical risk questions and actual lotteries with significant payouts to predict agricultural decisions. More recently, Roth et al.

¹ See Arrow {1972} and La Porta et al {1997} among others. See Sobel {2002} for a review of the social capital literature.

² See Roth {1995}.

{1991}, Henrich {2000}, Henrich et al. {2001a}, Henrich et al. {2001b}, and Barr {2003} have conducted experiments in the field. By conducting the game with participants in a Peruvian group banking project, I examine how behavior in the game correlates with future repayment and savings decisions. I find that "trustworthy" behavior in a trust game predicts higher repayment of loans and savings deposits; however, I find that more "trusting" behavior predicts the lower savings and higher repayment problems. I put the term "trusting" in quotes specifically because this paper calls into question whether Player A's behavior in the game is driven by trust or merely a propensity to gamble. Player B's actions, on the other hand, seem appropriately labeled as measuring "trustworthiness."

Many studies have found that answers to the General Social Survey (GSS) questions on trust, fairness, and helping others correlate as predicted with real financial outcomes. Likewise, Glaeser et al. {2000} find that in a laboratory trust game individuals identified by the GSS questions as more trusting in fact behave in a more trustworthy (but not trusting) fashion. I also examine whether these GSS survey questions can predict real financial decisions on a micro-level, and they do. More positive answers to the GSS questions predict higher repayment and higher savings, just like the trustworthy measure from the trust game.

This project also sheds insight into the determinants of default and savings for participants in a group banking project for the poor. Karlan {2002} finds that social capital, measured by geographic proximity and cultural similarity, caused lower default and higher savings due to improved monitoring or enforcement of group lending contracts. Now, I find support for an even simpler explanation of default: some individuals are fundamentally not trustworthy.

This paper proceeds as follows: Section II discusses the existing literature on measuring trust and trustworthiness. Section III presents the games conducted for this project. Section IV presents the institutional setting of the lending and savings organization and the data. Section V presents the determinants of behavior in the games. Section VI presents the predictions of future financial decisions. Section VII concludes.

II. MEASURING SOCIAL CAPITAL

Social capital can be construed on a group level (see Putnam {1995} or Coleman {1990}) or on an individual level (see Glaeser, Laibson, and Sacerdote {2002}). This paper examines using experimental economics to measure individual-level social capital. Individual-level social capital can be defined as the social skills and networks that enable an individual to overcome imperfect information problems and form contracts with others³. Trust and trustworthiness are two critical traits encompassed by individual social capital. The General Social Survey (GSS) of the University of Chicago National Opinion Research Center contains three questions which purport to measure trust and other cognitive social capital concepts⁴. The three questions are the trust question, "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?", the fairness 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?", and the helpful question, "Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?"

In macro-level comparisons, several papers conduct cross-country regressions and argue that the GSS questions correlate with outcomes of interest. Knack and Keefer {1997} finds correlations with growth. Kennedy, Kawachi, Prothrow-Stith, Lochner, and Gibbs {1998} and Lederman et al. {2002} finds correlations with violent crime. Brehm and Rahn {1997} finds correlations with civic involvement. Fisman and Khanna {2000} finds correlations with communication infrastructure. Guiso, Sapienza, and Zingales {2000} finds correlations of similar trust questions with management of personal finances across different regions of Italy.

Glaeser et al. {2000} examines a wide range of covariates and find the trust game to correlate as expected with many more traditional measures, such as history of prior interaction and cultural similarity.

³ See Putnam {1995}, Coleman {1990}, Fukuyama {1995}, and Ostrom {1990} for earlier work developing social capital frameworks. See Stone {2001}, Krishna and Shrader {2000}, Grootaert and van Bastelaer {2001}, and Lundåsen {2001} for a discussion of measuring social capital.

⁴ Cognitive social capital refers to attitudes and behaviors between people, versus structural social capital which refers to social interactions. See Krishna and Shrader {1999} and Uphoff {1999}.

Glaeser et al. conducts two experimental economics games, a trust game and a lost wallet game, and find that more trusting individuals, as identified by the GSS survey, behaved more trustworthily, but not more trusting, in the experimental setting. The key innovation of this project beyond that of prior work such as Glaeser et al is the linkage of the game to real propensity to overcome market failures (i.e., loan repayment), rather than proxies for them (i.e., length of relationship with partner). Barr {2003} finds that individuals in resettled villages in Zimbabwe trust each other less than individuals in non-resettled villages. Furthermore, a team of anthropologists and economists conducted ultimatum games in 15 different small-scale societies and found that the more integrated a society's markets, hence having higher returns to cooperation, the higher the cooperation observed in the experiments {2001a, 2001b}. Similar to the evidence found in this paper, Eckel and Wilson {2002} also conclude that risk-averse individuals "trust" less in the trust game⁵.

III. THE GAMES

A. The Trust Game

The trust game is a variant of a game originally conducted by Berg, Dickhaut, and McCabe {1995} and more recently by Glaeser et al. {2000} and Barr {2003}. The game was conducted as follows: First, before assigning the roles, all rules were explained to the participants. Since many participants in the sample were illiterate, all instructions were given orally in both Spanish and Quechua⁶. Then, participants were paired randomly⁷ and assigned either an A or a B. Both participants then received three nuevos soles, which is equal to about two thirds of a typical daily wage in Ayacucho, Peru, for the working poor (3.4 nuevos soles = US\$1). As the participants were paired up, they could observe the

⁵ See Chaudhuri and Gangadharan {2002} for similar arguments.

⁶ Most of the participants were fluent in both Spanish and Quechua. However, about 15 percent of the participants spoke only Quechua, the indigenous Incan language, and 10 percent spoke only Spanish.

⁷ Attendance was taken in each meeting as part of the group's normal procedures. Since I did not know who would be in attendance on a given day, the random matching of partners had to be done ad hoc immediately prior to the meeting. Using that day's attendance roll and client numbers, I randomly paired numbers together, purposefully alternating between choosing numbers close to each other and further from each other, since individuals with close numbers were more likely to have begun the program at the same time.

identity of their partner, but were separated immediately and hence had no opportunity to communicate⁸.

The A's then had the opportunity to pass to the B's zero, one, two, or three of their coins. I doubled the amount passed such that B received zero, two, four, or six coins from A. Then, B could pass back, again via me, any number of coins to A. Given the finite end, and assuming no future consequences to play, the sub-game perfect equilibrium was for B to pass back nothing to A and hence for A to pass nothing to B.

Note that if Player B passed less than half back, then Player A received less than she passed, and hence likely felt cheated. If Player B passed exactly half back, this was considered the *even split* action. Passing back more than half would be a generous action. Note, however, that Player B could calculate half in two ways. If B wanted to split total proceeds evenly with A, she should have included her original three coins when calculating half. However, anecdotal evidence suggested that the B's did not include their original three coins when calculating half. These coins were pocketed and then no longer seen as part of the game⁹.

Similar to Barr {2003}, who conducted this game in Zimbabwe, much care had to be taken to ensure that participants in fact understood the game. The transactions for both parties were done face to face with the game administrator (either me, or for primarily Quechua-speaking groups, my assistant). Although this risked that our presence influenced their decision, it had the distinct advantage that we could observe the clients individually to ensure they understood the rules. If it was apparent that they did not understand the game, the rules were explained again to them, one-on-one. While we were outside the room with each participant individually, another research assistant remained inside the room to monitor the others and prevent any communication.

The average amount sent by Player A in the trust game, out of three soles, was 1.38 and the average amount returned by Player B was 1.54. Table 1a shows these results. The distribution was

⁸ Participants were told throughout that talking would force me to disqualify them. It was never necessary to carry out this threat. The most communication I ever witnessed was an occasional grin or smirk among participants as the B partners left the room.

⁹ These coins were given to B in order to be consistent with prior implementations of the trust game. The motivation for doing this, typically, is to rule out "fairness" as the explanation of A passing to B, since if A passes zero, both end up with the same number of coins.

relatively flat, with 22.2 percent of Player A's passing the maximum of three soles, 16.6 percent passing two soles, 38.5 percent passing one sol, and 22.7 percent passing nothing. Player B's response does not appear to be reciprocal. For instance, Table 1b shows that the percentage of B's who pass back over 50 percent does not change conditional on the number of coins received from A. The percentage of B's who pass back under 50 percent does increase significantly when A passes three versus two or one coins. However, most of this is a shift from passing exactly half (three coins) to slightly less than half (two coins), and since such an option is not available if A passed only one or two coins, this shift should not be construed as evidence for reverse reciprocity. As an investment, passing is a bad idea on average: if Player A passes one coin, she can expect 0.89 back; two coins yield 1.71 and three coins yield 2.53¹⁰.

The basic results of the game are consistent with prior implementations of similar games in many respects. In all implementations, a significant portion of players contributed more than zero, the subgame perfect equilibrium. Glaeser et al. {2000} finds many Player A's passing the full amount and also finds that the more Player A passes to Player B, the higher the percentage returned by Player B, evidence supporting some reciprocity.

B. The Public Goods Game

A simple public goods game was conducted with the same participants, in 41 groups. Each group contained individuals who participate in the group lending and savings program together (see the next section for a description of this program). The group size varied from 9 to 29 due to a combination of the size of the lending and savings group and the attendance on the day of the game. The public goods game typically was played before the trust game, but the results were not revealed until after the participants had played the trust game¹¹. All rules were explained publicly, but with no opportunity to discuss the game as a group. Each participant was given one coin (equal to one third of a daily wage). Privately, each individual then either gave me back the coin or did not. If I received 80 percent or more of the coins

¹⁰ Furthermore, the percentage returned by B does not predict how much A passes. Hence, A is not "savvy" in simply knowing which B's will return and which will not. These results are not included in the tables to this paper, but are available upon request.

¹¹ This was done to mitigate interaction and learning effects between the two games.

back, I then gave everyone two coins. Table 2 shows the basic results of this game. Contribution rates ranged from 55.6 to 100 percent, and 24 out of 41 groups (59 percent) reached the goal of 80 percent.

IV. THE INSTITUTIONAL SETTING AND THE DATA

A. FINCA-Peru

The games were conducted with members of FINCA-Peru, a non-profit group lending organization in Ayacucho, Peru¹². FINCA-Peru organizes and funds groups that borrow and save together. The program is one of many around the world created to provide credit to poor women to help them start or expand small businesses. Typical businesses are retail, such as selling clothing, food or other household goods from stalls in street markets. Loans are four-months, and clients remain in the program on average one year. Although some remain in the program for many years, 25 percent leave after their first loan. After each loan is repaid, clients can then borrow more. FINCA-Peru places a strong emphasis on savings, often lecturing clients on the importance of developing their own savings base from which to invest in their businesses.

Each group consists of 30 women who meet weekly at the FINCA office and typically take out two loans and save together. One loan is the four-month loan from FINCA mentioned above. The other loan is from their savings pool and is typically a one-month loan. In their weekly meeting at FINCA, clients make payments on their loans, make savings deposits, and also (sometimes) take out a loan from the pooled savings. Typically, all savings are lent out, if not to the same client then to another client. The savings component is very similar to a rotating savings and credit association (ROSCA)¹³. If all rules are adhered to exactly, and participants borrow the most that they can, they will have a 2:1 leverage ratio after the first one or two loan cycles. If a client defaults, the group typically does not allow the client to remain in the program. Exceptions occur. A large part of FINCA's operating philosophy focuses on encouraging clients to develop their solidarity, or social capital. This is evident in many ways, e.g., the training

¹² FINCA-Peru is affiliated with FINCA International, a U.S.-based nonprofit that operates group banking projects in 30 countries. FINCA stands for Foundation for International Community Assistance.

¹³ See Besley, Coate and Loury {1993} for a description and analysis of ROSCAs.

provided to the employees and clients and the posters propagating the values of camaraderie, trust, and teamwork.

Many individual clients (14 percent of individuals in this sample) do not use the leverage opportunity, but rather maintain more savings than loans. The interest rate paid on the loans is significantly higher than the interest earned on the savings (96 percent annually versus 9 percent annually, on average). This behavior can be explained in many ways. Qualitative data suggest three stories dominate: (1) individuals place high emotional value on attaining and maintaining savings, and would prefer to pay interest on a loan rather than "lose" these savings, (2) individuals do this as a commitment device to force themselves to save (see Laibson, Repetto, and Tobacman {2002} and Bertaut and Haliassos {2002}), and (3) individuals value the option of leveraging, and if they were to withdraw their savings rather than borrow against their savings, they lose the ability to borrow further. Essentially, these individuals have not maximized their borrowing, and for this reason I label them as financially "cautious". I will examine whether individuals who engage in this behavior (i.e., do not maximize their debt) behave distinctly in the trust game.

B. The Data

The 864 participants in this research have been participants in a FINCA-Peru village bank for up to three years, although the majority has been in the program for less than one year. The data come from four sources: the games, an individual survey conducted privately, an individual survey conducted publicly, and financial savings and loan data. A private survey was conducted with each individual, typically before the game was played. I hired 10 surveyors from a local university, Universidad de San Cristobal de Huamanga in Ayacucho, to conduct these surveys. Five of these students spoke fluent Quechua and were responsible for all interviews of participants who spoke only Quechua.

A second survey was conducted publicly with the whole group on questions about the existing and prior relationships between individuals in a group. The answers to questions in the group survey were known to many present. This was done for three reasons. First, individuals were more likely to

speak truthfully for fear of others seeing them be untruthful. Second, other individuals were able to help answer when one person had difficulty understanding subtle distinctions between the questions. Third, this procedure was significantly faster because each question needed to be asked just once or twice.

One year after playing the game I gathered the savings and loan outcome data. FINCA also maintained basic demographic data, such as age, gender, number of children, civil status, and educational level.

Table 3 shows the summary statistics for the key financial outcomes (loan default, savings, and dropout) as well as the demographic, social, and attitudinal data collected in the above-mentioned surveys. I use three key outcomes: default, dropout due to default or poor attendance¹⁴, and voluntary savings. Loan default is defined as the maximum observed unpaid debt at the end of a loan cycle in the year following the game. The savings outcome is the sum of the voluntary savings deposited in the year following the game. The dropout variable is equal to one if the group reported that an individual left the group due to either default or disciplinary problems and is equal to zero otherwise (which includes those who stayed or who left for benign reasons). Using financial data from before playing the game is not fruitful because too few individuals had any default prior to playing (because those that had default typically were removed from the program).

V. DETERMINANTS OF BEHAVIOR IN THE GAMES

A. The Trust Game

The analysis consists of two parts. First, I test what predicts behavior in the trust game. This analysis is much akin to Barr {2003} and Glaeser et al. {2000} and produces similar results. This analysis is done separately for Player A and Player B. For the trust game, the dependent variable for Player A is the percentage of the three coins that were passed by Player A to Player B. For Player B the dependent variable is the percentage of the coins received that were passed back to Player A. The typical

¹⁴ The reason for leaving the program was recorded by the group's leaders on loan documents with FINCA

interpretation of the trust game labels Player A's behavior as "trust" and Player B's behavior as "trustworthy."

Table 4 and Table 5 show the analysis of the determinants of behavior in the trust game. The OLS specification is as follows¹⁵:

$$(1) \quad Y_i = a + \beta_1 X_i + \beta_2 P_i + \beta_3 G_i + \epsilon_i,$$

where Y_i is the percentage passed to the other player of the amount possible to pass. The determinants can be divided threefold: the individual characteristics (X_i), the pairing characteristics (P_i), and the group characteristics (G_i). The individual characteristics encompass basic demographics, such as education and age. The pairing characteristics encompass the relationship between the individuals paired together, such as cultural similarity, geographic proximity, and church attendance. Group characteristics encompass aggregated measures of the geographic and cultural dispersion of the group. The analysis is conducted twice, once for Player A and once for Player B.

When both individuals are indigenous, Player A passes 26.7 percent (significant at 99 percent) more whereas Player B does not behave differently. On the other hand, when Player A is indigenous and Player B is Western, Player B returns 18.7 percent more to Player A (significant at 99 percent). Player B also returns less when more individuals in the group are of the same cultural background. The first result is consistent with Glaeser et al. {2000} which found that individuals within minority groups returned more to similar minority groups and returned less to other minority groups. The second and third findings are inconsistent with Glaeser et al., but consistent with an ultimatum game study conducted in Mongolia in which players exhibited favoritism to individuals in other ethnic groups, but not within their own group {F. Gil-White, 2002}. The positive coefficient on cross-minority pairing might be the result of charitable instincts. Westerners are typically wealthier than indigenous individuals, and Westerners might use physical appearance to form perceptions of poverty. Hence, Westerners with charitable instincts might return more to indigenous individuals. Another study {C. Fershtman and U. Gneezy, 2001} finds that, in

¹⁵ Errors were corrected for clustering at the group level, where group is defined as the women in the same lending and savings circle.

Israeli society, men of Eastern origin were systematically mistrusted even by other men of Eastern origin. The difference between the Harvard, Mongolian, Israeli, and Peruvians is no surprise and furthers the point that understanding the cultural environment is critical to understanding social interactions. These findings demonstrate the importance but difficulty in drawing conclusions about cultural attitudes from the games without identical rules and context {J. Henrich, R. Boyd, S. Bowles, C. Camerer, E. Fehr, H. Gintis and R. McElreath, 2001a}.

Geographic proximity to each other predicts trusting and trustworthy behavior. If Player B lives within a 10-minute walk of Player A, then Player A passes 8.4 percent more to Player B (significant at 95 percent). The analog for Player B is 4.7 percent, but is not significant statistically. For Player B, however, the further she lives from all other members of the group (not just the partner), the less she returns to Player A (significant at 90 percent). This could be construed as trustworthiness or fear of reprisal. In this sense, trustworthiness is driven by fear of reprisal rather than innate personal characteristics.

Attending the same church also predicts trusting, but not trustworthy behavior. All participants were asked which church they attend "most frequently." There are two churches that are the largest and most frequently attended. A dummy was set equal to one if two people reported attending the same church, but not the largest church. The largest church was removed for two reasons; first, individuals were less likely to interact with each other at the large church (or expect much future interaction), and second, if the respondent did not attend church but felt compelled to name a church in this survey, she most likely named the largest, most well-known one. Attending the same church (but not the largest one) predicts Player A will pass 20 percentage points (significant to 95 percent) more to Player B. Those who report attending the largest church pass 7.7 percentage points (significant to 90 percent) less to Player B. Other results for religious activities, such as number of days since last attendance, no attendance, or evangelical affiliation all prove insignificant statistically.

Of the 397 pairings, 98 were in separate lending and savings groups. Being in the same group as your partner should suggest that the clients expect to interact with each other in the future and also

suggests they know each other beforehand. The coefficient on a dummy variable for being in the same group is positive for Player B and negative for Player A, but in neither case statistically significant. Interacting this dummy with other variables of interest, such as cultural similarity and distance to each other's homes, does not change the results (results not shown); however, the sample cells of these interaction effects typically are too small for analysis¹⁶.

Instances of borrowing cash directly from other members (i.e., as a side contract to the group lending and savings contract) also predict trustworthy behavior¹⁷. This follows intuitively, in that individuals who are trustworthy are more able to secure loans from their peers. On the other hand, individuals who pass more as Player A have fewer such side contracts. I suggest that individuals who pass more as Player A are risk-takers, and others in the group know this and hence do not loan to them one to one. Supporting this idea, the negative and strongly significant coefficient (99 percent) on simultaneously saving more than borrowing suggests that risk-takers (i.e., individuals who borrow more than they save) pass more as Player A. This explanation is supported by anecdotal observations that when Player A handed me the money to pass to Player B, Player A often said "Voy a jugar," or "I am going to play." This suggests that many Player A's viewed this as a gamble, to "play" or "not to play," and not merely as an act of trust.

The General Social Survey questions discussed earlier predict trustworthy (significant to 90 percent), but not trusting, behavior. This particular finding is consistent with Glaeser et al. {2000} and particularly important since those questions are one of the leading alternatives for measuring social capital in the field. Other measures of social interaction, such as attending a celebration of the partner (or vice versa) and being able to recall more group members' names, predict neither trusting nor trustworthy behavior.

¹⁶ These results are not included in the table, but are available from the author by request.

¹⁷ Specifically, each member was asked "how many times over the past twelve months have you borrowed cash directly from another member of your group?" Note that since this is technically frowned upon by FINCA, answers to this question are biased downward, and the bias is perhaps correlated with characteristics of interest in this paper.

Table 5 analyzes the amounts sent by both players as a function of the characteristics of the partner. Column 1 reports how Player B's characteristics influence Player A's actions. Column 2 uses a probit to analyze whether the Player B's that received no coins (and hence are removed from the sample for analysis of Player B action) are noticeably different. Column 3 reports how Player A's characteristics influence Player B's actions.

Player A passes more to Player B when Player B is more similar culturally and lives closer to the others in the lending group. This suggests that Player A passed more when Player B was more connected to others in the group, hence perhaps indicating that Player A recognized that any sanction by Player B would be more effective. This result holds for Player B's pass back to Player A as well, although it is only significant statistically for geographic distance. Furthermore, indigenous players get more passed to them, whether Player A or B. This could be identifying charitable motives, as discussed above. The religion data show that those who attended church least recently are passed more, and those who do not attend church at all are passed more as well.

Table 5, column 2 shows an analysis of the Player B's who do not get passed anything. If Player B's are not passed anything specifically because they are not trustworthy, then any analysis on Player B's behavior would suffer from a selection bias wherein the untrustworthy were removed from the sample. I analyze the characteristics of the Player B's that were not passed anything in order to ascertain the relevance of this potential bias¹⁸. Few characteristics predict this attrition, which bodes well for the analysis in general of Player B's actions. The only two statistically significant results are cultural similarity to the group (the more similar to the group, the more likely to have received a pass) and being Western (less likely to have received a pass). Had measures such as instance borrowing from others been important, this would have indicated that Player A was strategically not passing to untrustworthy individuals.

¹⁸ This problem could have been avoided using a strategy method, but I did not believe the education and literacy level of the participants permitted such an approach.

B. The Public Goods Game

Table 6 reports the determinants of behavior in the public goods game. As the dependent variable is binary, the individual analysis is conducted both with a probit model (column 1) and with a linear probability model (column 2). Errors are corrected for clustering at the group level. The basic specification is as follows:

$$(2) \quad Y_i = a + \beta_1 X_i + \beta_2 G_i + \epsilon_i,$$

where Y_i is the percentage passed to the other player of the amount possible to pass. The determinants can be divided twofold: the individual characteristics (X_i) and the group characteristics (G_i). For the group analysis, the dependent variable is the percentage of the group that contributed to the public good. Due to degrees of freedom problems, only a few of the independent variables are used.

First, note that those who pass more in the trust game also are more likely to contribute to the public good¹⁹. Second, individuals who simultaneously save more than they borrow contribute less in the public goods game²⁰. This supports the finding earlier in the trust game that Player A sometimes saw the trust game as a gamble, not an act of trust. Again, in the public goods game, often participants would say "I am going to play" when they handed me the money. Contrary to Player A in the trust game, individuals who have more instances of borrowing directly from their peers are more likely to contribute to the public good (significant at 90 percent).

Few personal demographics predict behavior in the public goods game. The most significant finding is that more Western individuals contribute less to the public good and that individuals who attend church less frequently contribute less to the public good.

¹⁹ This is true for both Players A and B, although the specification reported in Table 5 does not show this breakdown.

²⁰ In a specification not shown in the tables, I find that when the indicator variable for simultaneously saving and borrowing is interacted with debt level, the interacted term is positive, hence those who borrow and save simultaneously pass less, but this effect weakens for those with high debt levels.

VI. PREDICTING FINANCIAL DECISIONS

If the trust game can be taken seriously, then it should be able to predict future behavior. By linking the borrowing and saving data to the trust game data, I am able to test whether behavior in the games predicts real financial decisions up to one year later. I test several hypotheses: (1) individuals who return more as Player B are trustworthy and hence should be more likely to repay their loans, (2) individuals who pass more as Player A are more trusting (gambling) and hence should save more (less), (3) individuals who contribute more to public goods should be better participants of their group, and hence default less and save more, and (4) those who answer the GSS questions affirmatively are more likely to repay their loans and save more²¹.

I use three outcomes: default on the loan, dropped out due to default or discipline (self-reported by the group), and total voluntary savings. Table 7 reports the results with each cell representing a separate specification. For each outcome, the analysis is conducted first as a simple OLS (or probit in the case of dropout) and then with control variables for many of the known predictors of financial outcomes (see Karlan {2002}). By adding the covariates, I am able to examine whether the trust game predicts financial decisions after controlling for the observable, more traditional, predictors of trust and trustworthiness. Indeed, the results remain when adding the covariates. In particular, the tests of the trust game include controls for the responses to the GSS questions. Results are robust to including these controls; hence, the trust game predictions are not a result merely of their correlation with the GSS questions.

Rows A and B show the results for the trust game for Players A and B, respectively. The predictions for trustworthiness, for Player B, fit the hypothesis perfectly. The more trustworthy the individual, the lower the default, the less likely to drop out, and the higher the voluntary savings, significant to 95 percent. The magnitude of these results are significant as well: a shift from 25 to 50

²¹ I also examined whether Player B's who received more from Player A (hence were trusted more) were more likely to repay their loans. The results were insignificant, both economically and statistically.

percent for Player B's trustworthiness score predicts a 5.6 percent point drop in the probability of dropout due to default or discipline and a 6.7 percent point drop in the probability of default.

However, the results for trusting behavior, Player A, are exactly opposite. The more "trusting" the player, the lower the total voluntary savings and the more likely she is to drop out for default or discipline (but not significantly more likely to have higher default). The result suggests that individuals who pass more as Player A are gamblers, more willing to take on risks, or alternatively phrased, poor investors, unable to recognize a bad proposition. Individuals who take on bad risks, or make bad investments, should default more and be less likely to save voluntarily. Player A, on average, receives 85 cents for each dollar passed²². This conjecture explains why individuals who pass more as Player A are more likely to default one year after playing the game. If the "trust" label were appropriate, one would expect the exact opposite, particularly with respect to savings. Group savings are at risk to the group; hence, each deposit into the communal savings pool is an act of trust.

These results on Player A also affect the interpretation of the Player B results. If in fact Player A is not only about trust, then can Player B behavior be labeled strictly about trustworthiness? If Player B correctly assesses that their pass represents part expectation of future interaction, part gamble, and part trust, then what should determine their behavior? The analysis on Player B presented here suggests that despite the murkiness of Player A's motivation, Player B's behavior is indeed about trustworthiness.

²² Although this negative return was not known beforehand, a Player A with a keen sense of business perhaps could have determined that one is unlikely to make profits by passing money.

Table 7, row C shows the results for the public goods game. The public game has no predictive power. The point estimates are close to zero, so the lack of predictive power does not seem to be merely a lack of statistical precision. The public goods game has no predictive power in this context; however, it would be interesting to observe its predictive power in a more direct and related link, such as willingness to produce local public goods such as schools, wells, or health clinics.

Table 7, rows D and E show the results for the General Social Survey questions. Answering affirmatively to the questions relative to society as a whole is negatively correlated with default and dropping out due to default or discipline (significant to 95 and 99 percent, respectively). The questions do not, however, predict savings behavior. In other words, the GSS questions predict default, or trustworthy actions, but fail to predict savings, or trusting actions. This finding strikes close to Glaeser et al.'s {2000} finding that although the GSS questions purport to measure trusting behavior, they in fact seem to measure trustworthiness.

VII. CONCLUSION

This paper demonstrates that even though behavior in the trust game might correlate intuitively with other measures of social capital, using it as a measure of social capital alone deserves further research, with particular attention paid to the motives behind Player A's actions. Although to trust is almost by construction to take on a risk, when the social capital literature discusses trust it is not referring to gamblers per se, but rather to the ability for social norms and relationships to mitigate the risks inherent in informal contracts.

The prior literature on the trust game claims it measures trust for Player A and trustworthiness for Player B. Similar to Eckel and Wilson {2002}, I find evidence that Player A measures propensity to take risks. Other evidence (i.e., both players being indigenous, living near their partner, and attending the same church) does support the social capital or "trust" hypothesis. Hence, behavior is determined by both types of traits. This raises doubts about the ability to use the game as a measure purely of trust.

Trustworthiness, on the other hand, does not suffer from this murkiness, as I find strong support for using Player B's behavior as a measure of trustworthiness. The trustworthiness, in this context, might be an individual-specific characteristic, or it might be capturing individuals more sensitive to social sanctions. In both settings, the loan and the game, failure to behave in a trustworthy fashion could trigger a reprisal. Hence, the analysis cannot distinguish cleanly between trustworthiness driven by an innate personality trait and fear of social reprisals. The positive correlation between trustworthiness in the game and answers to GSS questions suggests that the link is driven by underlying personal characteristics, but the positive correlation between trustworthiness in the game and links between individual participants suggests that the link is driven by fear of reprisal. Naturally, the correct answer is probably a combination of the two.

By testing experimental economics in a real setting where social capital is purported to matter, two important points are made. First, a simple Trust game can indeed predict repayment of a loan enforced almost entirely through social pressure. This endorses experimental economics as a valid measurement tool for field research. Second, it demonstrates that social capital is an important component determining the success of group lending programs. Although these data do not show whether social capital can be created, they do suggest that if harnessed lenders can help solve failures observed in the financial markets for the poor.

REFERENCES

- Arrow, Kenneth. "Gifts and Exchanges." *Philosophy and Public Affairs*, 1972, *1*, pp. 343-62.
- Barr, Abigail. "Trust and Expected Trustworthiness: Experimental Evidence from Zimbabwean Villages." *Economic Journal*, 2003, *113*(489), pp. 614-30.
- Berg, J.; Dickhaut, J. and McCabe, K. "Trust, Reciprocity, and Social History." *Games and Economic Behavior*, 1995, *10*, pp. 122-42.
- Bertaut, Carol and Haliassos, Michael. "Debt Revolvers for Self Control." *Board of Governors of the Federal Reserve System working paper*, 2002.
- Besley, T.; Coate, S. and Loury, G. "The Economics of Rotating Savings and Credit Associations." *American Economic Review*, 1993, *83*, pp. 782-810.
- Binswanger, Hans. "Risk Attitudes of Rural Households in Semi-Arid Tropical India." *American Journal of Agricultural Economics*, 1980, *62*, pp. 395-407.
- Binswanger, Hans and Sillers, Donald. "Risk Aversion and Credit Constraints in Farmers' Decision-Making: A Reinterpretation." *Journal of Development Studies*, 1983, *20*, pp. 5-21.
- Brehm, J. and Rahn, W. "Individual-Level Evidence for the Causes and Consequences of Social Capital." *American Journal of Political Science*, 1997, *41*(3), pp. 999-1024.
- Chaudhuri, Ananish and Gangadharan, Lata. "Gender Differences in Trust and Reciprocity." *Paper presented at 2002 NEUDC, Wellesley*, 2002.
- Coleman, James S. *Foundations of Social Theory*. Cambridge, MA.: Harvard University Press., 1990.
- Eckel, Catherine and Wilson, Rick. "Whom to Trust? Choice of Partner in a Trust Game." *Virginia Polytechnic Institute and State University working paper*, 2002.
- Fershtman, Chaim and Gneezy, Uri. "Discrimination in a Segmented Society: An Experimental Approach." *Quarterly Journal of Economics*, 2001, *116*(1), pp. 351-77.
- Fisman, Raymond and Khanna, Tarun. "Is Trust a Historical Residue? Information Flows and Trust Levels." *Columbia University Working paper*, 2000.
- Fukuyama, Francis. *Trust*. New York: Free Press, 1995.
- Gil-White, Francisco. "Ultimatum Game with an Ethnicity Manipulation: Results from Bulgan Cum, Mongolia." J. Henrich, R. Boyd and H. Gintis, *Cooperation, Punishment and Reciprocity: Experiments in 16 Small-Scale Societies*. 2002,
- Glaeser, David; Laibson, David and Sacerdote, Bruce. "The Economic Approach to Social Capital." *Economic Journal*, 2002, *112*, pp. 437-58.
- Glaeser, Edward; Laibson, David; Scheinkman, Jose and Soutter, Christine. "Measuring Trust." *Quarterly Journal of Economics*, 2000, *115*, pp. 811-46.
- Grootaert, Christiaan and van Bastelaer, Thierry. "Understanding and Measuring Social Capital." *World Bank Social Capital Initiative Working Paper No. 24*, 2001.
- Guiso, Luigi; Sapienza, Paola and Zingales, Luigi. "The Role of Social Capital in Financial Development." *NBER Working Paper #7563*, 2000.
- Henrich, Joseph. "Does Culture Matter in Economic Behavior? Ultimatum Game Bargaining among the Machiguenga of the Peruvian Amazon." *American Economic Review*, 2000, *90*, pp. 973-79.

- Henrich, Joseph; Boyd, Robert; Bowles, Samuel; Camerer, Colin; Fehr, Ernest; Gintis, Herbert and McElreath, Richard. "Cooperation, Reciprocity and Punishment in Fifteen Small-Scale Societies." *American Economic Review*, 2001a, 91(2), pp. 73-78.
- Henrich, Joseph; Boyd, Robert; Bowles, Samuel; Camerer, Colin; Fehr, Ernest; Gintis, Herbert; McElreath, Richard; Alvard, Michael; Barr, Abigail; Ensminger, Jean, et al. "Economic Man in Cross-Cultural Perspective: Behavioral Experiments in 15 Small-Scale Societies." *Sante Fe Institute Working Paper*, 2001b.
- Karlan, Dean. "Social Capital and Group Banking." *MIT Dissertation, Chapter One*, 2002.
- Kennedy, B.P.; Kawachi, I.; Prothrow-Stith, D.; Lochner, K. and Gibbs, B. "Social Capital, Income Inequality, and Firearm Violent Crime." *Social Science and Medicine*, 1998, 47(1), pp. 7-17.
- Knack, Stephen and Keefer, Philip. "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation." *Quarterly Journal of Economics*, 1997, November 1997, pp. 1251-88.
- Krishna, Anirudh and Shrader, Elizabeth. "Measuring Social Capital." *World Bank Social Capital Initiative Working Paper Series*, 2000.
- _____. "Social Capital Assessment Tool." *paper prepared for World Bank Conference on Social Capital and Poverty Reduction*, 1999.
- La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R. "Trust in Large Organizations." *American Economic Review Papers and Proceedings*, 1997, 87, pp. 333-38.
- Laibson, David; Repetto, Andrea and Tobacman, Jeremy. "A Debt Puzzle." *NBER Working Paper #7879*, 2002.
- Lederman, Danial; Loayza, Norman and Menendez, A. M. "Crime: Does Social Capital Matter?" *Economic Development and Cultural Change*, 2002, 50(3), pp. 509-39.
- Lundasen, Susanne. "Can We Trust the Measurement of Trust?" *Paper presented at 2001 Annual Meeting of the American Political Science Association*, 2001.
- Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, MA: Cambridge University Press., 1990.
- Putnam, Robert. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy*, 1995, 6, pp. 65-78.
- Roth, Alvin. *Introduction to Experimental Economics*. Princeton, NJ: Princeton University Press, 1995.
- Roth, Alvin E.; Prasnikar, Vesna; Okuno-Fujiwara, Masahiro and Zamir, Shmuel. "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study." *American Economic Review*, 1991, 81(4), pp. 1068-95.
- Sobel, Joel. "Can We Trust Social Capital?" *Journal of Economic Literature*, 2002, 40(1), pp. 139-54.
- Stone, Wendy. "Measuring Social Capital." *Australian Institute of Family Studies Research Paper No. 24*, 2001.
- Uphoff. "Understanding Social Capital: Learning from the Analysis and Experiences of Participation," Dasgupta and Seregeldin, *Social Capital: A Multifaceted Perspective*. Washington, D.C.: World Bank, 1999,

Table 1a
Trust Game
Basic Results

Coins Passed	Player A		Player B	
0	90	22.7%	55	17.9%
1	153	38.5%	107	34.9%
2	66	16.6%	93	30.3%
3	88	22.2%	36	11.7%
4			10	3.3%
5			5	1.6%
6			1	0.3%
Total	397	100.0%	307	100.0%

Table 1b
Trust Game
Player B's Reciprocity

Coins Passed by Player A	Coins Returned by Player B							Total
	0	1	2	3	4	5	6	
1	43 28%	84 55%	26 17%					153 100%
2	7 11%	15 23%	35 53%	8 12%	1 2%			66 100%
3	5 6%	8 9%	32 36%	28 32%	9 10%	5 6%	1 1%	88 100%
Total	55 18%	107 35%	93 30%	36 12%	10 3%	5 2%	1 0%	307 100%

Procedures for Trust Game

Both players given 3 coins.

Player A allowed to pass 0, 1, 2, or 3 coins to Player B.

Game administrator doubles Player A's pass to Player B.

Player B can pass back to Player A 0-100 percent of the coins received in the pass.

All rules explained to both players ex-ante, hence common knowledge.

Rules explained in both Spanish and Quechua.

Players cannot communicate, but players are informed of the identity of their partner.

Typical Interpretation of Trust Game Results

Player A's actions typically interpreted as a measure of trust.

Player B's actions typically interpreted as a measure of either trustworthiness or reciprocity.

See Glaeser et. al. {2000}, Barr {2003}, and Berg et. al. {1995} for further analysis and results from trust game.

Table 2
Public Goods Game
Basic Results

Group ID#	# of players	# of contributions	Percentage Contributed	Won?
1	9	8	88.9	Yes
2	11	8	72.7	No
3	11	10	90.9	Yes
4	14	11	78.6	No
5	14	12	85.7	Yes
6	15	9	60.0	No
7	16	14	87.5	Yes
8	17	13	76.5	No
9	17	14	82.4	Yes
10	18	10	55.6	No
11	18	13	72.2	No
12	19	16	84.2	Yes
13	19	17	89.5	Yes
14	20	15	75.0	No
15	20	17	85.0	Yes
16	20	18	90.0	Yes
17	21	14	66.7	No
18	21	17	81.0	Yes
19	21	18	85.7	Yes
20	21	19	90.5	Yes
21	22	16	72.7	No
22	22	19	86.4	Yes
23	23	13	56.5	No
24	23	18	78.3	No
25	23	19	82.6	Yes
26	23	20	87.0	Yes
27	23	21	91.3	Yes
28	23	23	100.0	Yes
29	24	17	70.8	No
30	24	22	91.7	Yes
31	25	19	76.0	No
32	25	20	80.0	No
33	25	24	96.0	Yes
34	26	21	80.8	Yes
35	26	22	84.6	Yes
36	26	23	88.5	Yes
37	27	20	74.1	No
38	27	25	92.6	Yes
39	28	17	60.7	No
40	28	23	82.1	Yes
41	29	22	75.9	No
Mean	21	17	80.7	
Median	22	17	82.4	

24 out of 41 (59 percent) group achieved their threshold and received their bonus.

697 out of 864 (81 percent) individuals contributed.

Table 3
Summary Statistics
Means

	Mean	Obs
FINANCIAL DATA		
Percent of dropout in one year following games due to default or discipline	0.247 (0.015)	864
Total voluntary savings deposits in one year following games	65.478 (4.546)	864
Highest level of default in one year following games	53.516 (4.390)	864
DEMOGRAPHIC DATA		
Average distance to other members of group (who played the games)	13.320 (0.546)	845
Percentage of other members who live within a 10-minute walk (who played the games)	0.169 (0.005)	845
Percentage of other members of similar cultural background (who played the games)	0.251 (0.005)	845
Indigenous	0.187 (0.013)	851
Western	0.387 (0.017)	851
Distance to FINCA office (town center)	10.049 (0.337)	845
Completed high school education	0.202 (0.014)	830
SOCIAL INTERACTION DATA		
Instances borrowing from group member in side contracts	0.345 (0.048)	852
Instances borrowing from non-group members	0.712 (0.059)	852
Instances of attending/hosting group members at celebrations	0.530 (0.035)	740
Number of other members able to name from memory	6.618 (0.163)	741
GENERAL SOCIAL SURVEY QUESTIONS		
Sum of all six questions	1.997 (0.044)	851
Sum of three questions relative to other group members	1.452 (0.031)	851
Sum of three questions relative to society as a whole	0.545 (0.025)	851
RELIGIOUS DATA		
Months since last attended church	0.697 (0.086)	740
Attends evangelical church	0.085 (0.010)	740
Does not attend church	0.043 (0.007)	740
Attends largest church	0.353 (0.018)	740

Standard errors reported in parentheses.

Table 4
Determinants of Amount Sent: OLS

	Percent Passed (Player A)		Percent Returned (Player B)	
	Multivariate (1)	Univariate (2)	Multivariate (3)	Univariate (4)
ATTITUDINAL/BEHAVIORAL MEASURES				
Amount received from Player A			-0.0060 (0.0105)	0.0053 (0.0094)
Sum of 3 GSS Questions, Relative to Group	-0.0085 (0.0222)	-0.0074 (0.0200)	0.0199 (0.0209)	0.0247 (0.0206)
Sum of 3 GSS Questions, Relative to Society	-0.0007 (0.0259)	-0.0152 (0.0226)	0.0417 * (0.0227)	0.0399 * (0.0200)
Did Not Maximize Available Debt (Savings > Borrowings)	-0.1053 *** (0.0373)	-0.0770 * (0.0141)	0.0201 (0.0358)	0.0246 (0.0342)
CONNECTEDNESS TO GROUP				
Percentage of group of similar culture	0.0843 (0.0171)	0.0088 (0.1353)	-0.2165 (0.1295)	-0.0927 (0.0850)
Distance to others in group	0.0132 (0.0229)	0.0001 (0.0001)	-0.0130 * (0.0074)	-0.0002 *** (0.0001)
Percentage of others who live within 10-minute walk	-0.0869 (0.1253)	-0.0059 * (0.0035)	0.0829 (0.0926)	0.0038 (0.0041)
Instances borrowing from group member in side-contract	-0.039 * (0.0226)	-0.041 * (0.0206)	0.018 ** (0.0073)	0.016 ** (0.0058)
Number of other members able to name from memory	0.0003 (0.0043)	0.0001 (0.0040)	-0.0018 (0.0049)	-0.0014 (0.0043)
CONNECTEDNESS TO PARTNER				
Partner in same lending/savings group	-0.0513 (0.0484)	0.0068 (0.0452)	0.0754 (0.0495)	0.0599 (0.0412)
Both players indigenous	0.2353 *** (0.0932)	0.1782 ** (0.0800)	0.0236 (0.0669)	0.0784 (0.0519)
Both players Western	0.0481 (0.0546)	0.0755 (0.0542)	-0.0086 (0.0640)	-0.0380 (0.0416)
Player Western; partner indigenous	-0.0587 (0.0764)	-0.0521 (0.0797)	0.1903 *** (0.0634)	0.1818 *** (0.0507)
Player indigenous; partner Western	0.1245 (0.1028)	0.0553 (0.0758)	-0.0209 (0.0775)	0.0300 (0.0489)
Partner lives within 10-minute walk	0.0874 ** (0.0361)	0.0919 ** (0.0371)	0.0493 (0.0442)	0.0625 (0.0397)
Attends same small church as partner	0.2072 ** (0.0876)	0.2278 *** (0.0843)	0.0169 (0.0571)	0.0120 (0.0546)
Knew partner and her name	0.0485 * (0.0289)	0.0320 (0.0264)	-0.0019 (0.0274)	0.0164 (0.0225)
Attended/Invited partner to party	0.0666 (0.1029)	0.0467 (0.0981)	-0.0148 (0.0902)	0.0047 (0.1097)
Absolute value of age difference	-0.0001 (0.0019)	0.0001 (0.0018)	-0.0006 (0.0014)	0.0008 (0.0016)
DEMOGRAPHIC INFORMATION				
Completed high school	0.1285 *** (0.0465)	0.1003 ** (0.0470)	0.0598 (0.0440)	0.0323 (0.0406)
Age	0.0044 ** (0.0018)	0.0034 ** (0.0014)	0.0038 ** (0.0015)	0.0043 *** (0.0011)
Indigenous	-0.0897 (0.0791)	0.0398 (0.0519)	0.0179 (0.0750)	0.0633 (0.0410)
Western	0.0047 (0.0499)	0.0200 (0.0352)	0.0748 (0.0612)	0.0253 (0.0352)
Months since last attended church	0.0014 (0.0133)	-0.0164 (0.0124)	-0.0012 (0.0033)	-0.0049 (0.0035)
Does not attend church	0.0571 (0.1074)	0.0399 (0.1022)	-0.0390 (0.0613)	-0.0423 (0.0485)
Attends largest church	-0.0758 * (0.0405)	-0.0914 *** (0.0334)	0.0022 (0.0438)	-0.0036 (0.0365)
Observations	397		307	
# of clusters (groups)	41		41	
R-squared	0.1232		0.1586	

*** 99% significance; ** 95% significance; * 90% significance

For the culture indicator variables, the omitted category is the middle, "mixed culture" category.

Standard errors corrected for clustering at the group level.

Dummies included for missing data with missing values coded as zero.

Table 5
Amount Sent as a Function of Recipient Characteristics: OLS, Probit

	Percent Passed Player A OLS (1)	Passed > 0 Player A Probit (2)	Percent Returned Player B OLS (3)
ATTITUDINAL/BEHAVIORAL MEASURES			
Sum of 3 GSS Questions, Relative to Group	-0.0048 (0.0142)	-0.0381 (0.0740)	0.0051 (0.0195)
Sum of 3 GSS Questions, Relative to Society	-0.0213 (0.0261)	-0.0764 (0.1003)	0.0021 (0.0180)
Did Not Maximize Available Debt (Savings > Borrowings)	0.0924 (0.0473)	0.1162 (0.1966)	0.0464 (0.0412)
CONNECTEDNESS TO GROUP			
Percentage of group of similar culture	0.2685 * (0.1420)	1.2870 * (0.7327)	0.1810 (0.1273)
Distance to others in group	-0.0038 * (0.0112)	0.0235 (0.0544)	0.0438 *** (0.0133)
Percentage of others who live within 10-minute walk	-0.1119 (0.1141)	0.0446 (0.5377)	0.1342 (0.0893)
Instances borrowing from group member in side-contract	0.003 (0.0077)	0.058 (0.0450)	-0.014 (0.0272)
Number of other members able to name from memory	-0.0018 (0.0041)	-0.0247 (0.0181)	-0.0039 (0.0034)
DEMOGRAPHIC INFORMATION			
Completed high school	0.0360 (0.0606)	0.2470 (0.2324)	0.0801 (0.0503)
Age	-0.0016 (0.0018)	-0.0021 (0.0062)	0.0012 (0.0017)
Indigenous	0.0911 * (0.0518)	0.2622 (0.2113)	0.0950 * (0.0460)
Western	-0.0568 (0.0369)	-0.2833 * (0.1670)	-0.0219 (0.0356)
Months since last attended church	0.0039 (0.0035)	0.0183 (0.0251)	0.0203 ** (0.0085)
Does not attend church	0.2392 ** (0.0985)	0.4466 (0.4442)	0.0249 (0.0725)
Attends largest church	-0.0785 * (0.0449)	-0.0751 (0.1786)	-0.0280 (0.0368)
Observations	397	397	307
# of clusters	41	41	41
R-squared	0.0611	0.0322	0.0842

*** 99% significance; ** 95% significance; * 90% significance

For the culture indicator variables, the omitted category is the middle, "mixed culture" category.

Standard errors corrected for clustering at the group level.

Pseudo-r-squared reported for probit specification in column 2.

Dummies included for missing data with missing values coded as zero.

Table 6
Public Goods Game: Determinants of Contributing
Probit & OLS

	Unit of Observation: Dependent Variable:	Individual 1=Invested Probit (1)	Individual 1=Invested OLS (2)	Group % Invested OLS (3)	Group % Invested OLS (4)
ATTITUDINAL/BEHAVIORAL MEASURES					
Amount passed in trust game		0.1252 ** (0.0546)	0.1186 ** (0.0519)	0.1884 * (0.1108)	0.2033 * 0.1202
Sum of 3 GSS questions, relative to group		0.0184 (0.0141)	0.0178 (0.0173)	0.1287 ** (0.0636)	
Sum of 3 GSS questions, relative to society		-0.0143 (0.0199)	-0.0125 (0.0195)	0.1291 (0.1065)	
Sum of 6 GSS questions					0.1177 ** (0.0556)
Did Not Maximize Available Debt (Savings > Borrowings)		-0.0833 * (0.0472)	-0.0752 * (0.0454)		0.0199 (0.1382)
CONNECTEDNESS TO GROUP					
Percentage of group of similar culture		0.1041 (0.0954)	0.1032 (0.0955)	0.2257 (0.2057)	0.2401 (0.2054)
Distance to others in group		-0.0115 * (0.0070)	-0.0142 (0.0091)		-0.0099 (0.0201)
Percentage of others who live within 10-minute walk		-0.0160 (0.0783)	-0.0259 (0.0770)		
Instances borrowing from group member in side-contract		0.022 (0.0144)	0.008 * (0.0051)		
Number of other members able to name from memory		0.0021 (0.0040)	0.0018 (0.0039)		
DEMOGRAPHIC INFORMATION					
Completed high school		-0.0370 (0.0485)	-0.0386 (0.0495)		
Age		-0.0057 (0.0047)	-0.0047 (0.0036)		
Age-squared		0.0000 (0.0001)	0.0000 (0.0000)		
Indigenous		0.0028 (0.0535)	0.0004 (0.0481)		
Western		-0.1242 *** (0.0370)	-0.1215 *** (0.0365)		
Months since last attended church		-0.0104 * (0.0057)	-0.0139 * (0.0073)		
Does not attend church		-0.0200 (0.0804)	-0.0269 (0.0816)		
Attends largest church		0.0589 * (0.0336)	0.0566 (0.0350)		
Observations		864	864		
# of clusters		41	41		
R-squared (pseudo-R-squared for probit)		0.0579	0.0568		

Table 7
Predicting Individual Financial Outcomes
OLS, Probit

Dependent Variable: Control Variables Included:		Default		Dropped Out Due to Default or Discipline		Total Voluntary Savings Contributions	
		No OLS (1)	Yes OLS (2)	No Probit (3)	Yes Probit (4)	No OLS (5)	Yes OLS (6)
(A)	Percent passed in trust game, player A n=397	-1.356 (18.902)	-10.139 (19.010)	0.117 * (0.064)	0.149 ** (0.065)	-35.412 *** (13.040)	-40.477 ** (16.227)
(B)	Percent returned in trust game, player B n=307	-56.223 ** (27.881)	-62.636 * (35.267)	-0.2531 ** (0.104)	-0.218 ** (0.098)	62.363 ** (25.492)	51.528 ** (23.313)
(C)	Public goods game behavior, individual n=864	-6.140 (16.707)	-8.204 (15.790)	-0.014 (0.034)	-0.033 (0.040)	-6.850 (9.304)	-0.846 (9.820)
(D)	GSS survey questions, relative to society n=794	-14.899 ** (6.320)	-15.358 ** (6.055)	-0.050 ** (0.019)	-0.0507 *** (0.019)	4.288 (6.297)	5.963 (7.082)
(E)	GSS survey questions, relative to group n=794	-3.5324 (5.351)	-3.914 (5.884)	-0.011 (0.019)	-0.0137 (0.020)	5.980 (7.704)	6.0304 (7.939)

Appendix, Table 1
 Summary of Prior Literature on Trust Game

Location:	Glaeser et. al. {2000} U.S.		Barr {1999} Zimbabwe		Burks et al {2001} U.S.		Ashraf et. al. {2002} U.S., S.Africa, Russia		Eckel Wilson {2002} U.S.	
	Player A	Player B	Player A	Player B	Player A	Player B	Player A	Player B	Player A	Player B
GSS trust	pos	pos*					pos	pos		
GSS index	neg	pos**								
Trust strangers	pos*				neg	zero	pos	pos*		
Prior contact	pos*	pos**								
Only child	neg	neg**								
Cross-culture	neg	neg*							neg**	zero
Resettled village			neg**	zero						
Female	neg	zero	pos	neg*	neg*	pos	pos	zero	pos**	neg
Risk aversion							neg	zero	neg**	zero

** 95% significance; * 90% significance