Traditional Trust Measurement and the Risk Confound: An Experiment in Rural Paraguay ⋆

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Abstract

Play in the traditional trust experiment depends both on trust beliefs and on levels of risk aversion. We ran two experiments with a diverse set of subjects in fifteen villages of rural Paraguay, the traditional trust experiment and a new experiment measuring only risk aversion. We find that risk attitudes are highly predictive of play in the trust game. In addition, omitting risk aversion as a regressor in trust regressions significantly changes the coefficients of important explanatory variables such as gender and wealth.

Key words: Trust, Risk Aversion, Experiment, Paraguay, Gender
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1 Introduction

The trust/investment game, originally described in Berg et al. (1995) (BDM), has become the trademark means of measuring trust in a burgeoning literature on trust. Some authors have noted that the trust game does not allow one to distinguish between a highly trusting person and a person with low levels of risk aversion (Karlan, 2005; Eckel and Wilson, 2004); i.e. a person may take more trusting actions because he actually trusts more or because he is more willing to take a gamble.[2] Consistent with Gambetta (1988) we define trust to be an agent's subjective probability that another agent will perform an action beneficial to him. In the trust game it is represented by the player's assessment of the probability distribution over the actions of his anonymous partner, where a higher level of trust means a subjective distribution with higher mean and lower variance.

In this paper, we run both the traditional trust game, and a very similar gambling game with 188 players in fifteen villages of rural Paraguay, and compare agents' actions in the two games. We find that play in the risk game is significantly predictive of play by the trustor (player 1) in the trust game.[3] This effect is not dissipated when we control for altruism. In addition, controlling for risk aversion in trust regressions significantly changes the coefficients of some of the correlates of play in the trust game. Males have often been found

[2] In fact, Andreoni et al. (2003) found "unexpectedly" that risk aversion importantly affects play in ultimatum games as well.

[3] Henceforth when we write "play in the trust game" we are referring to the trustor's move, not the trustee's move (player 2). The trustee's move will be briefly analyzed in Section 4.3, but we do not focus on it as it involves no risk.

to be more trusting than woman in the trust game (Chaudhuri and Gangadharan, 2002; Burks et al., 2003; Eckel and Wilson, 2000; Buchan et al., 2003). In this paper we find that this effect is due to females' higher levels of risk aversion, and not to lower levels of trust *per se*.

The benefit of running both the trust game and a gambling game with similar payoff structure is that, in theory, the only difference between the players' moves in the two games should be due to differences in their assessments of payoffs from the random gamble and from trusting their fellow villagers. On the other hand, as the games are similar and the players played the risk game first, they may then frame the trust game as a gamble as well. We do run a robustness check and find that while a player's behavior as trustor has strong predictive power for his behavior as trustee, his bet in the risk game does not have any. This suggests that the player considers the trust decision a different decision than the risk decision. Still, the issue of framing is inherent in the design of the games, and leaves an area open for future investigation.

If play in the trust game is correlated with trusting behavior in the real world, and if trusting behavior is correlated with economic growth (Knack and Keefer, 1997), better functioning organizations (Fukuyama, 1995; La Porta et al., 1997) and increasing village incomes (Narayan and Pritchett, 1999), then it is interesting to look at how much of trusting behavior in the trust game is due to trust and how much to low risk aversion. The rest of this paper is organized as follows: Section 2 discusses the game design and previous applications of trust and risk games, Section 3 discusses the data and the experimental procedures, Section 4 disentangles the contribution of risk aversion to play in the trust game, and section 5 concludes and discusses directions for future research.

2 Game Design and Previous Applications of Trust and Risk Games

In the original trust game (sometimes called the investment game) designed by Berg et al. (1995), the trustor is given a sum of money. In the first move, the trustor must decide how much, if any, to send to an anonymous trustee. Any money sent to the trustee is tripled. The trustee makes the second move, deciding how much money to return to the trustor. Under the assumption of selfish preferences, the only sub-game perfect Nash equilibrium is for the trustor to send no money to the trustee, using backward induction to infer that the trustee will never return any money. Money sent by the trustor is commonly used to measure his trust that the anonymous trustee will return his money. Money returned by the trustee is used to measure his trustworthiness. In fact, participants do not tend to play the sub-game perfect equilibrium. In the U.S., Berg et al. (1995) find that only two out of 32 trustors sent nothing, and of the 30 trustees who were sent money, only six returned nothing. [4]

Results from the investment game confound differing levels of risk aversion with differing levels of trust. Two people with the same (non-zero) level of trust, but different levels of risk aversion will play the role of trustor differently (Karlan, 2005; Eckel and Wilson, 2004). Assume two players believe that half of the trustees will return double and half will return half of their original investment. Although both players are equally trusting, the more risk averse trustor will send less money, and appear less trusting. Thus, play by the trustor in the trust game depends both on trust beliefs and on risk aversion.

[4] A trustee who returns money may do so out of concerns for fairness or reciprocity, but we do not focus on why he would return money rather than keeping it.

Many researchers have already noted this confound. Barr (2004) found that villagers in resettled villages of Zimbabwe sent less in the trust game than those in older villages. She hypothesizes that this is because resettled villagers are more uncertain about each other's behavior, but cannot reject the possibility that this is due to self-selection of more uncertainty averse individuals into resettled areas (although she claims this is unlikely). Karlan (2005) finds that, in Peru, individuals who sent more in the trust game were more likely to default on their microfinance loans and saved less. He concludes that apparently highly trusting people may actually just be "more willing to take on risks".

Other papers have compared trust and risk aversion in a controlled setting (Ashraf et al., 2003; Eckel and Wilson, 2000, 2004) using university students as their subjects. Ashraf et al. (2003) ran both trust and risk experiments. Their risk experiment was a choice between cash and a 50/50 lottery to win \$300 or nothing. They find that risk aversion has no significant effect on trust decisions, though the effects do go in the correct direction. The game they used to measure risk aversion is quite different from the trust game, and so may not lead as easily to direct comparison. In addition, though the stakes were relatively high, only one player in a group of approximately thirty was randomly chosen to be paid according to his or her choices. If players make their decisions based on the expected payoff, or if they take into account that their decision only has a three percent chance of mattering, the subjects may not have the right incentives to make a careful decision.

Eckel and Wilson (2000) find that more risk averse trustors choose less risky trust games, but don't look at how risk aversion affects trustors' behavior within the trust game. Eckel and Wilson (2004) play a binary choice trust game and a binary choice risk game with similar payoffs. They find that risk

and trust are not correlated. Because their bet size is only $5 it is improbable that this measures the risk aversion of American college students. [5]

Our game design allows us to begin to disentangle actual trust (belief that the trustee will reciprocate) from risk aversion. We ran two experiments, one measuring players' risk aversion, as well as the more traditional BDM investment game. The risk experiment was designed to resemble the first move in the investment game but involved only risk and no trust, as the payoffs were decided by the roll of a die. A major contribution of this paper is that a) the players are not students, they are rural villagers with diverse wealth levels and ages, b) the payoffs were quite large, as players won in total an average of two days' wages, c) the trust game was not played as a binary decision, but, as in the version played by Berg et al. (1995), with a range of discrete choices, and d) the risk game was designed to be quite similar in format and have quite similar payoffs to the trust game (though this could be a disadvantage as well in terms of priming the subjects to think of the trust game as a gamble).

The rules of the risk game were as follows: the investor was given a sum of money (the same amount he was given in the trust game) and was given the same five choices of how much (if any) to invest. The experimenter then rolled a die to determine the investor's payoffs. A roll of one meant the investor lost his investment, two meant he recovered only half his investment, three meant he recovered his investment, four meant he earned 1.5 times his investment, five meant he doubled his investment, and six meant he earned 2.5 times his investment. We designed the risk game to yield similar returns to those from

[5] In fact, 75% of the subjects chose the risky gamble over the certain amount with the *same* expected value, indicating apparently risk-seeking behavior.

trust games played in rural Zimbabwe (Barr, 2003).

3 Data Source and Experimental Procedures

The data used in this paper was collected in 2002 as the fourth round of a panel data set.[6] More detailed experimental procedures are given in Appendix A, but we will give a brief summary here. After three or four days of surveying in each village we invited a player from each household which had participated in the survey to play the games. They were told they would win, on average, one and a half days' wages, or 18,000 Guaranies.[7] In the two largest villages, we held the game in two sessions, one in the morning and one in the afternoon. The groups for the two sessions were chosen based on location of the households, and there seemed to be no communication between the two groups, as the houses of the two groups were quite far apart. 188 of the 223 families surveyed sent a family member to play the game.[8]

[6] In 1991 the Land Tenure Center at the University of Wisconsin and the Centro Paraguayo de Estudios Sociológicos implemented a survey of 300 rural Paraguayan households in three departments and sixteen villages across the country. The sample was random, and stratified by land-holdings. The original survey was followed up by subsequent rounds in 1994, 1999, and, most recently, 2002.

[7] I predicted average winnings based on results of experiments run by other researchers in developing countries, but preferred to exceed expectations rather than disappoint. In actuality the players won, on average, 24,000 Guaranies each.

[8] None of the nine households in the Japanese immigrant village were interested in playing. Excluding the Japanese, who are very much wealthier than the rest of the population, those households which did not send a player were significantly more wealthy and had significantly younger household heads.

The risk game was played first. The game's instructions were given in a group setting with no questions allowed. Then the players were called into the room one at a time, given a second explanation, and allowed to ask questions in private. They then made their bet, saw the roll of the die, and were given an IOU. The players were then all called back into the room to hear the explanation of the trust game. Every player played both the role of trustor and trustee. They came into the room one at a time to put the money they were sending to the trustee in an envelope, and watched me triple it. The envelopes were then shuffled and the players came back into the room one at a time. We used the strategy method, asking the trustees how much they would send back given each of the four possible amounts they might receive and told them that they were then committed to sending back that amount. Then they opened the envelope that was assigned to them, took out the amount that they had precommitted to taking out, and left the rest in the envelope. The players then came into the room one at a time to open their original envelope and see how much was left. At this point we paid them their total winnings.

As in many experiments in rural villages (Barr, 2003; Karlan, 2005), due to the importance of ensuring players with varying levels of education all understood the game, and difficulties in running experiments in a village setting, the game was not double blind. In addition, Burks et al. (2003) find that playing both roles in the trust game decreases both trust (the amount sent) and trustworthiness (the share returned). They hypothesize that playing both roles reduces the player's sense of responsibility for the well being of his partner and reduces his sense of guilt for behaving selfishly. If this is the case, playing both roles will decrease the correlation of play in the trust game with altruism and cause

Table 1
Individual summary statistics

Variable [a]	Mean	Min	Max
Male	69.7%		
Catholic	95.7%		
Guarani Language	81.4%		
Brazilian	9.0%		
Age	48.67	18	84
Educ (years)	4.80	0	12
Family Size	5.59	1	12
Land Owned (hectares)	22.37	0	580
Per-Capita Wealth [b]	23,700,000	40,000	763,000,000
Gifts given	309,060	0	3,290,000
Donations Given	211,684	0	2,140,000
P.I. at Survey	31.9%		
Bet in Risk Game [c]	3,436	0	8,000
Sent in Trust Game	3,745	0	8,000
Share Returned by Trustee [d]	.434	0	1
No. of Obs.	188		

[a] The variables are described in more detail in Appendix B.
[b] The relevant exchange rate is approximately 4,800 Guaranies to the dollar.
[c] For both the risk and trust game the choice set was 0, 2,000, 4,000, 6,000, or 8,000.
[d] Note, any share greater than .33 means that trust has positive payoffs, as the amount the trustor sent had been tripled originally.

trust beliefs and risk aversion to be the two main determinants of play. [9]

In Table 1 we find summary statistics for the players. The players are of extremely diverse ages, education levels, and wealth levels. In Table 2 we find the summary statistics for the villages surveyed. They are also of diverse levels of wealth, inequality, and size. A description of the variables is found in

[9] In addition, if each player only plays one role, then giving endowments only to the first mover creates a confound between trust and fairness. As players knew that everyone would play both roles this concern was somewhat alleviated.

Table 2
Village summary statistics

Variable	Mean	Min	Max
Households	175.7	30	720
Households Migrated In	12.2	0	55
Km to Bus	.67	0	7
Mean Wealth	25,500,000	2,272,317	140,000,000
Gini of Wealth among Players	.577	0.273	.838
No. of Obs.	15		

Appendix B. In the risk game nine percent of the players bet nothing and seven percent of the players bet all 8000 Guaranies, while the mean bet was 3,436 Guaranies. The average amount sent in the trust game was slightly higher, with seven percent of the players sending nothing, nine percent sending everything, and a mean amount sent of 3,745 Guaranies. Trust did pay on average, as trustees returned 43.4 percent of the amount they received.[10] Forty percent of players bet the same amount in both games, while 23 percent of the players bet more and 36 percent trusted more. A Wilcoxon signed-rank test for paired data rejects the hypothesis that the median difference between the bet in the risk game and the amount sent in the trust game is zero with a p-value of .039.

We compare our results with those of other trust games (Barr, 2003; Berg

[10] While trustees did return more money to trustors who sent more, as a proportion of what they received they actually sent slightly less. Players who received 6,000 Guaranies returned 44.2 percent of the money while players who received 24,000 Guaranies returned 42.4 percent. (Women returned 41.5 percent of 6,000 Guaranies, but only 36.8 percent of 24,000 Guaranies.) It seemed much easier for the trustees to be 'fair' when the stakes were small, but when they were faced with splitting two days' wages (especially women who seldom have access to money of their own) they were tempted to keep a larger share.

et al., 1995) to test for understanding by the players and comparability of results. The trust game played by Barr in rural Zimbabwe was also designed to give payoffs to the trustor of approximately one half day's wages. The principal difference between her experiments and ours is that in Paraguay players played both the role of trustor and trustee. In addition, the Paraguayan players played the risk game first, which they did not in Zimbabwe. A Mann-Whitney rank sum test of equality in the distributions of the amount sent in the Paraguayan and Zimbabwean populations cannot reject the null that the two distributions are the same with a p-value of .1374, and a two-sample Kolmogorov-Smirnov test for equality of distributions cannot reject the null with a p-value of .580.

The average percent of a bet recouped from a fair die, given our rules, would be 125% with a standard deviation of 85.6. (The sample average from the actual rolling of the die was 118%.) The average percent of the amount sent by the trustor recouped from all of the different strategies elicited by the trustee was 131% (with a standard deviation of 64.2). If we ignore all strategies elicited which were not actually used we find that the average percent recouped was 130% (with a standard deviation of 61.0). [11]

4 Disentangling Risk from Trust

We will disentangle risk aversion from trust in Section 4.1 by running three different types of regressions. We will look at correlates of (1) the amount bet

[11] The trustee chose a strategy for each amount he might receive. This acts as a check that the game was truly anonymous. If the players had somehow known how much their friends had sent or with whom they were playing, we might expect the actual returns to be higher than the average returns from all strategies elicited.

in the risk game, (2) the amount sent in the trust game without controlling for the amount bet, and (3) the amount sent in the trust game controlling for the amount bet.[12] In Section 4.2 we see if our results still hold after controlling for altruism and reciprocity. In Section 4.3 we run some robustness checks to see what effects having players play both games may have on their actions.

4.1 Correlates of Risk Aversion and Trust

Variation in play in the trust game is largely explained by risk attitudes. As the amount the player bets in the risk game increases, so does the amount he sends in the trust game. In all regressions, no matter what other variables are included, play in the trust game depends importantly on risk attitudes.

Column (1) of Table 3 shows that males are less risk averse than females, betting more. In the trust regression which does not control for risk attitudes (column (2)), men also seem to trust significantly more than women, but this is due to risk attitudes. Once we control for risk aversion in column (3), men and women no longer have significantly different levels of trust. Other researchers have found that women trust significantly less than men in the trust game (Chaudhuri and Gangadharan, 2002; Burks et al., 2003; Buchan et al., 2003; Eckel and Wilson, 2000) but in Paraguay we find that this is solely due to their higher level of risk aversion.

We also see that wealthier households are less risk averse, implying decreas-

[12] Although results presented here are OLS, the ordered probit model gives quite similar results. The OLS results are presented for ease in interpretation of the coefficients. In all regressions we divide the amounts sent and bet by 1,000.

Table 3
Risk game and trust game regressions

	Bet in Risk Game	Amount Sent in Trust Game	
	(1)	(2)	(3)
Male	.778**	.578*	.362
	(.328)	(.335)	(.324)
Age	.069	.004	-.014
	(.044)	(.042)	(.040)
Age-Squared	-.0007*	-.00009	.00004
	(.0004)	(.0004)	(.0004)
Education	.077	-.157**	-.178**
	(.067)	(.076)	(.077)
Catholic	.583	-1.584***	-1.746***
	(.702)	(.592)	(.565)
Family Size	.057	-.087	-.103
	(.075)	(.067)	(.068)
Log(Per-Capita Wealth)	.221**	.132	.071
	(.096)	(.108)	(.102)
Brazilian	-2.121	-.164	.424
	(1.729)	(1.236)	(1.213)
Guarani	-1.565**	-.332	.102
	(.646)	(.582)	(.552)
P.I. at Survey	.532*	.222	.074
	(.314)	(.318)	(.301)
Roll of Die	.093	.108	.082
	(.089)	(.089)	(.084)
Bet			.277***
			(.079)
Obs.	188	188	188
R^2	.271	.219	.278

OLS with heteroskedasticity-consistent standard errors in parenthesis.
*-90%, **-95%, and ***-99% significant.
Game session fixed effects were included in the regression.

ing absolute risk aversion. These wealthier households are also slightly more trusting before one controls for risk aversion, though after controlling for risk aversion they trust no differently than less wealthy households. More educated people send less in the trust game, suggesting that they are less trusting. Households which speak Guarani at home, instead of Spanish or Portuguese, are slightly more risk averse but trust no more or less than others. Catholic households are much less trusting, and no more or less risk averse, though there are only eight non-Catholic (Protestant) households in the sample.

The dummy variable for whether or not I sat in on that household's survey (meaning that the household met me a few days prior to playing the game) is slightly significant in explaining the amount bet on the roll of the die. Perhaps those households felt more comfortable with me, and thus bet more, or perhaps the presence of a 'gringo' convinced them that this strange situation was real and that there would be monetary payoffs. This did not effect play in the trust game, possibly because by the time we played the second game all players believed the stakes were real.

Because the risk game was played first, we might worry that players who were lucky in the risk game (had high die rolls) might send more in the trust game feeling they were on a lucky streak or send less feeling their luck was bound to change. This is not borne out by the evidence, as the roll of the die[13] is statistically insignificant in explaining the amount sent in the trust game.

In Table 4, we include five village characteristics instead of dummies for the 17 game sessions held. The individual-level results are not greatly affected

[13] We allocated the nine percent of players who bet nothing and thus did not roll the die a roll of 3.5, the mean of all possible rolls of the die.

Table 4
Risk game and trust game regressions including village characteristics

	Bet in Risk Game	Amount Sent in Trust Game	
	(1)	(2)	(3)
Male	.749**	.668**	.479
	(.319)	(.303)	(.296)
Age	.084**	-.004	-.025
	(.042)	(.038)	(.036)
Age-Squared	-.0009**	-1.00e-05	.0002
	(.0004)	(.0004)	(.0004)
Education	.069	-.137*	-.154**
	(.066)	(.075)	(.078)
Log(Per-Capita Wealth)	.189*	.119	.072
	(.106)	(.105)	(.103)
Guarani	-.702	-.567	-.391
	(.526)	(.437)	(.433)
P.I. at Survey	.523	.340	.208
	(.319)	(.308)	(.293)
Bet			.252***
			(.084)
Size of Village	.004**	.002	.001
	(.002)	(.002)	(.002)
# of Incoming Households	-.050**	-.012	-.0003
	(.022)	(.023)	(.022)
Km. to Bus Route	.002	.344***	.344***
	(.066)	(.107)	(.105)
Mean(Log-Wealth)	-.031	.204	.212
	(.247)	(.226)	(.225)
Gini of Wealth	.967	.434	.191
	(1.236)	(.942)	(.943)
Obs.	188	188	188
R^2	.165	.123	.179

OLS with heteroskedasticity-consistent standard errors in parenthesis.
*-90%, **-95%, and ***-99% significant.

Table 5
Including interactions with bet size in trust game regression.

Bet	0.288***	Bet	0.290**	Bet	0.312***
	(0.096)		(0.116)		(0.097)
Bet · Female	-0.158	Bet · No Prim Ed	-0.065	Bet · Non-Guar	−0.231
	(0.208)		(0.161)		(0.185)
Sum	0.130	Sum	0.225*	Sum	0.081
	(0.180)		(0.115)		(0.160)
Male	$N = 131$	Primary Ed.	$N = 76$	Guarani	$N = 153$
Female	$N = 57$	No Primary Ed.	$N = 112$	Non-Guarani	$N = 35$

Each column is a separate regression. Controls included as in Table 4.
OLS with heteroskedasticity-consistent standard errors in parenthesis.
*-90%, **-95%, and ***-99% significant.

by the change. Players in smaller villages with more immigration bet less, perhaps because these players live in a more rapidly changing environment which makes them more risk averse. Villages further away from a road on which a bus passes are more trusting. Mean wealth of the players and wealth inequality among the players are insignificant in all regressions. In results not shown here, we included the number of players in each game session and the share of male players in each game session, but their effects were insignificant. Risk attitudes remain strongly predictive of trust play.

We might wonder if the relationship between risk and trust is the same for all players. In other words, do some groups view the trust game as a pure game of risk while others view it purely as a game of trust? In Table 5 we rerun the trust regressions from Table 4 three times, the first time including the bet size and its interaction with gender, the second time with the bet size interacted with an education dummy,[14] and lastly with the bet size interacted with a primary language dummy. In Tables 3 and 4 we saw that men are less

[14] This is whether or not the player completed elementary school.

risk-averse than women. Nevertheless, in Table 5 we see that the correlations between risk attitudes and play in the trust game for men and women are not significantly different (though men's risk attitudes affect their play in the trust game more so than do women's).

Men and women, educated and non-educated people, and speakers of Spanish and Guarani all seem to view the trust game as a similar combination of risk and trust, though this test has extremely low power. We calculate the power (the probability of rejecting the null when it is false) of a test of the null that the true coefficient on the interaction term is zero, against the alternative that the coefficient is equal to the one found given a significance level of .90. The power of that test in the gender regression is .187, in the education regression is .107, and in the language regression is .344, all quite low. In order to approach a power level of .70 we would have needed 1535 observations in the gender regression, 5430 in the education regression, and 570 in the language regression. While the sample size here does not permit such subsample analysis, it leaves an interesting area for further examination.

One goal of this paper is to uncover the consequences of using trusting behavior in the trust experiment as a measure of actual trust without controlling for risk aversion. Are the coefficients in the trust regression significantly different when one does and does not control for risk aversion? Due to budget and time constraints, it may not be possible to play multiple games so it is desirable to know the implications of results from the most commonly played economic games. Throughout this paper I equate controlling for the bet in the risk game with controlling for risk aversion in general. It is important to keep in mind that this measure of risk aversion is crude, as it measures how the person played in just one game on one day of his or her life.

Table 6
Difference in coefficients before and after controlling for risk aversion.

Table	Insig.	10%	5%	1%	Total w/o fixed effects	Total
Table 3	5	3	2	1	.0041	.0008
Table 4	4	4	4	0	.0005	.0005

First set of columns is the number of variables whose coefficients differ significantly in the trust regressions before and after controlling for risk aversion.
Second set of columns is the p-value with which we can reject equality of all coefficients before and after controlling for risk aversion.
Results use covariance matrix from SUR for trust regressions, including risk aversion (restricting its coefficient to be as in OLS regression) and excluding risk aversion.

We look at whether or not the coefficients in the trust regressions, including and excluding the bet in the risk game, are significantly different from each other, allowing for a correlation in the errors between the two regressions. A summary of these results is presented in Table 6. Five of the explanatory variables from Table 3 do not have significantly different coefficients at the 10% level when one does and does not control for the bet in the risk game. The coefficient on Guarani is significantly different at the 1% level, gender and wealth at the 5% level, and age-squared, Brazilian, and P.I. at survey at the 10% level. We can reject at the .0041 level that all the explanatory variables have the same coefficient excluding the village dummies, and at the .0008 level when including the village dummies. Looking at the results in Table 4, four of the coefficients are not significantly different between the two regressions. The remaining eight include gender, age and age squared, and wealth at the 5% level and Guarani, P.I. at survey, size of village, and number of new households entering the village in the last three years at the 10% level. We can reject the hypothesis that all the coefficients are equivalent with a p-value of .0005. Variables such as gender, age, wealth, and indigenous heritage are often included in trust regressions, but their effects on trusting behavior are not stable when one does and does not control for risk attitudes.

4.2 Trust and Altruism or Fairness

Many researchers have argued that the measure of trust in the trust game confounds trust with altruism or fairness (Andreoni and Miller, 2002; Carter and Castillo, 2003; Cox, 2004). There are many reasons a player may send money to his anonymous partner including the possibilities that a) he trusts his village-mates (believing they will return a high share of the amount they receive), b) he is not very risk averse, c) he cares about increasing the total sum of money won by the village as a whole, d) he is altruistic, or e) he has a preference for fairness. We now control for altruism or fairness and see if this affects our results on the relationship between trust and risk aversion.

In columns (1) and (2) we control for the share of money the player returned when he played the role of trustee, as well as the average share returned by all trustees in the same game session. One might hypothesize that an altruistic player will send more as trustor and return more as trustee, thus appearing more trusting and trustworthy. Looking at Table 7 we find that the share the player returns to the trustor when playing the role of trustee is highly correlated with the amount he sends to the trustee when playing the role of trustor. Village level trustworthiness is, surprisingly, insignificant in determining trust. Trust and trustworthiness may also be correlated because a player plays as trustee in the same way he expects others to play (his trust beliefs). Another possibility is that the player remembers his own first move as trustor when he chooses his second move as trustee. A player who sends a large amount as trustor may return a large amount as trustee, hoping the person who receives his money will do the same.

Table 7
Trust game regressions including village characteristics and proxies for generosity

	Amount Sent in Trust Game					
	(1)	(2)	(3)	(4)	(5)	(6)
Male	.500*	.333	.603**	.435	.617**	.448
	(.298)	(.297)	(.304)	(.301)	(.306)	(.302)
Age	-.006	-.030	-.0004	-.023	.009	-.015
	(.037)	(.035)	(.037)	(.035)	(.038)	(.035)
Age-Squared	-2.58e-06	.0003	-.00006	.0002	-.00009	.0001
	(.0004)	(.0004)	(.0004)	(.0004)	(.0004)	(.0004)
Education	-.119	-.140*	-.129*	-.150*	-.125*	-.146*
	(.075)	(.078)	(.075)	(.078)	(.074)	(.077)
Log(Per-Capita Wealth)	.125	.075	.095	.048	.118	.069
	(.104)	(.103)	(.111)	(.107)	(.106)	(.104)
Guarani	-.442	-.275	-.588	-.416	-.557	-.387
	(.423)	(.419)	(.440)	(.439)	(.432)	(.428)
Bet		.256***		.256***		.256***
		(.082)		(.084)		(.084)
Trustworthiness of Individual	1.891**	1.864**				
	(.895)	(.850)				
Trustworthiness of Session	-1.006	-.985				
	(2.244)	(2.093)				
Log(Gifts)			.065	.059		
			(.068)	(.066)		
Log(Donations)					-.090	-.078
					(.088)	(.084)
Size of Village	.002	.0006	.002	.001	.002	.001
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
# of Incoming Households	-.009	.003	-.017	-.003	-.015	-.001
	(.023)	(.022)	(.023)	(.022)	(.024)	(.022)
Km. to Bus Route	.330***	.332***	.345***	.346***	.356***	.355***
	(.117)	(.114)	(.109)	(.106)	(.110)	(.107)
Mean(Log-Wealth)	.206	.212	.253	.254	.233	.236
	(.225)	(.223)	(.229)	(.227)	(.229)	(.229)
Gini of Wealth	.458	.191	.439	.177	.548	.273
	(.979)	(.986)	(.945)	(.937)	(.962)	(.960)
Obs.	188	188	188	188	188	188
R^2	.147	.206	.122	.181	.121	.180

OLS with heteroskedasticity-consistent standard errors in parenthesis.
*-90%, **-95%, and ***-99% significant.

In columns (3) through (6) we use two other proxies for altruism: the log of gifts (of farm production) given to friends and family and the log of donations (in time or money) made to the church, road repairs, and other communal projects. Neither is a significant predictor of trust. The other coefficients in the table change very little, both across the columns of Table 7, and in comparison with the results in Tables 3 and 4. While avoiding the debate on the relation between trusting behavior and altruism, we find that controlling for altruism has little effect on the relationship between trust play and risk aversion.

4.3 Issues of Framing

Throughout this analysis we have been assuming that although risk aversion may affect play in the trust game, trust does not affect play in the risk game. As play in the risk game depends only on the roll of a die, and not on expectations over the actions of other players, this seems to be a valid assumption. Still, one might think that because we played the risk game before the trust game we encouraged the players to think of the trust game as a gamble as well. [15] This is an especially serious issue given the recent literature on framing. Liberman et al. (2004) find that something as seemingly innocuous as calling the prisoner's dilemma the "Wall Street Game" instead of the "Community Game" makes players much more likely to defect. Harrison et al. (forthcoming) find that "prior experience with one task affects behavior in a subsequent

[15] This problem arises in any study playing multiple games with the same subjects. Eckel and Wilson (2004) play the trust game followed by 11 risky decisions, Ashraf et al. (2003) play two dictator games and a trust game (in different orders) and then six risky decisions, Karlan (2005) plays a trust game and then a public goods game, while Carter and Castillo (2003) play a dictator game and then a trust game.

task" when making players decide between a series of risky decisions.

We have shown in Section 3 that the distribution of our results for play in the trust game is similar to that in Zimbabwe where the risk game was not played first. In addition, in Table 8 we run two regressions, one on trustor behavior and one on trustee behavior. In both regressions we include as regressors the bet made by the player and his play in the other role in the trust game. We find that both risk-aversion and trustworthiness are significant predictors of trust. On the other hand, a player's play as trustor is a significant predictor of his play as trustee, while his risk aversion is not. This robustness check shows that play in the trust game and in the risk game are measuring two very different quantities. The player sees his play as trustor as being partly related to his trust and trustworthiness and partly related to his risk aversion. On the other hand, his trustworthiness is only related to his trust. Trustworthiness is not correlated with risk aversion, as it shouldn't be since the trustworthiness decision is not made under any uncertainty.[16] This is not conclusive evidence players aren't primed to view the trust game as a gamble, and further investigation in this area is warranted.

5 Conclusion

The traditional trust game first studied by Berg et al. (1995) measures a combination of trust beliefs and levels of risk aversion. Risk aversion plays an

[16] Households which give more gifts are significantly more trustworthy. Also, females are slightly less trustworthy, as found by Barr (2003). From discussions with the players, this seemed to be because women were not accustomed to having access to money of their own and so were much less willing to give it up.

Table 8
Trust game regressions for play as trustor and trustee

	Amt Sent in Trust Game	Share Returned in Trust Game
	(1)	(2)
Male	.339	.049
	(.298)	(.032)
Age	-.030	.005
	(.035)	(.004)
Age-Squared	.0003	-.00004
	(.0004)	(.00004)
Education	-.136*	-.005
	(.079)	(.008)
Log(Per-Capita Wealth)	.059	-.006
	(.106)	(.012)
Guarani	-.274	-.076
	(.424)	(.049)
Log(Gifts)	.037	.012**
	(.065)	(.006)
Bet	.255***	-.003
	(.082)	(.007)
Amt. Sent as Trustor		.018**
		(.009)
% Returned as Trustee	1.680**	
	(.831)	
Size of Village	.0006	.0004**
	(.002)	(.0002)
# of Incoming Households	.003	-.003*
	(.021)	(.002)
Km. to Bus Route	.334***	.001
	(.113)	(.010)
Mean(Log-Wealth)	.230	.010
	(.223)	(.022)
Gini of Wealth	.054	.070
	(.950)	(.114)
Obs.	188	188
R^2	.206	.132

OLS with heteroskedasticity-consistent standard errors in parenthesis.
*-90%, **-95%, and ***-99% significant.

important role in determining play in the trust game and this result is robust to including variables representing altruism. In addition, including the bet in the risk game as an explanatory variable in trust play regressions significantly changes the coefficients of other explanatory variables. Though men are often found to be more trusting than women, this seems to be due to risk aversion, and not due to differing levels of trust. The finding that wealthier people trust more than poorer people is also muted when one controls for risk aversion. In general, the finding of a correlation between trusting behavior and wealth must be interpreted with caution as wealthier people are also often less risk averse.

Given the experimental design here it is difficult to know if players treated the trust game as a gamble because they were primed to think that way by playing the risk game first. It would be interesting to rerun the same two games in the future but alternate their order in different villages. One could also design a risky decision with tradeoffs similar to those in the trust game but not so obviously similar to the trust game to the players. Another interesting possibility would be to run both games in addition to asking survey questions on recent natural shocks experienced by the player (such as whether his cow died, pests ate his crops, or a family member got sick) which should affect his level of risk aversion but not his level of trust. These variables could be used as instruments for the risky decision made in the game.

A Detailed Description of Experimental Procedures and Protocol

The three enumerators and I spent three or four days in each of the sixteen villages. The first two or three days were spent surveying the households. Be-

fore we began the survey we mentioned to the households that we would be playing a game a few days later with all the survey respondents. We said that one person per household could go to play (and we preferred, if possible, that it be the same person who answered the survey questionnaire), and that he or she would win on average one and a half days' wages (18,000 Guaranies). When we settled on a time and place to hold the game we informed each of the households, told them they would receive 1,000 Guaranies if they showed up on time, and offered to drive them to the game in our vehicle. The location was either the village church or the village dance hall. Two of the villages were so large that people lived quite far apart, so we split the households into two groups and played the game with half in the morning and half in the afternoon.[17] Participants were assigned to one of the two sessions based on their proximity to each other, and there didn't seem to be any communication between players of the morning group and the afternoon group, as the households were quite far apart.

Of the 223 households surveyed, 188 showed up for the game session. None of the nine households surveyed in the village of Japanese immigrants were interested in playing such a game. Even ignoring the Japanese, the households who did not show up were significantly wealthier than those who did,[18] have significantly younger household heads,[19] and trust significantly less (as measured by the World Values Survey trust question).

[17] In these two villages we interviewed twenty and twenty-four households, while in the other villages we only interviewed between seven and sixteen households.

[18] This is probably not due to their higher opportunity cost of time, as they did respond to the long survey with no pay.

[19] This may be because older people have more free time to attend meetings.

Almost all players showed up on time and received their 1,000 Guaranies immediately. We went inside the room where I hung a chart on the wall showing different play and the payoffs each would lead to. I first explained the risk game and gave four examples of bets and rolls of the die and their payoffs to the players in Guarani (the indigenous language of Paraguay). After that, one of the enumerators went through the exact same explanation and three different examples in Guarani, using the excuse that he thought people might not understand my accented Guarani (in fact we just wanted them to hear the instructions twice, though, my accented Guarani may have been an issue as well). They were not allowed to ask questions in the group setting, and were told to reserve questions until they came in individually to play the game.

After the explanation the players left the room and went outside to wait. The three enumerators waited outside with them, and were there to ensure no one discussed the game. (The players were told that if they were caught talking about the game they would be disqualified.) I called the players into the room one at a time from a randomly sorted list. I asked each player if he or she had any questions, and went through a few more examples with them. Then I gave the player 8,000 (fake plastic) Guaranies. They could choose to bet 0, 2,000, 4,000, 6,000, or 8,000 on the roll of the die by placing their bills on the table. If I rolled a 1, the player lost his bet, if I rolled a 2 he lost half of his bet, if I rolled a 3 he recouped his bet, if I rolled a 4 he received 150% of his bet, a roll of 5 meant he doubled his bet, and a roll of 6 meant he received 250% of his bet. If the player chose to bet, I rolled the die, and we calculated his payoffs. I then gave him an IOU which he saved until the end of both games.

After players had played the first game (the risk game), we called them back into the room and explained the second game (the trust game). We had a sec-

ond poster explaining the payoffs of the trust game hanging on the wall, and again both I and an enumerator explained the game using the same instructions but different examples. The players were each given the same endowment of 8,000 Guaranies and the exact same choice options as in the first game, i.e. sending 0, 2,000, 4,000, 6,000, or 8,000. I told them I would triple the amount they decided to send and put it in an envelope with a design on the front (curve, circle, diamond, triangle, etc.) and told them not to tell anyone what their symbol was. I called them each into the room one at a time in the same order as the previous game and each one made his decision. The player handed me back his IOU on which I added the amount he had kept (i.e. not sent). After all players had chosen how much money to send I went outside and shuffled the envelopes and had one of the players 'cut the deck' of envelopes (upside down so he couldn't see the figures on the front of the envelopes).

I then called the players back into the room one by one and asked them how much they would keep if they received 6,000, 12,000, 18,000, and 24,000 Guaranies respectively, eliciting data on all 4 possibilities. The order of the shuffled envelopes was the order in which they were given out. [20] When a player opened the envelope he counted the bills inside, and took out the amount he had precommitted to take, replacing the remaining bills in the envelope. I added the amount he had taken out of the envelope to his IOU.

After that, each player was called into the room individually one last time and was given back his original envelope. Each player opened his envelope and counted how much money had been returned to him. Then I added that

[20] Before the person entered the room, I checked the design on the envelope to make sure that it was not his own envelope. If it was (which did happen sometimes) I returned that envelope to the middle of the deck and gave him the next one.

amount to the other three numbers on his IOU and gave him the cash. Playing both games took approximately two and a half hours. The players were always extremely grateful for the cash they won, since as of late it is extremely difficult to find a paying job. Sometimes the players would jokingly complain that we should have brought them cookies too, because they got hungry. We did always bring ice and yerba mate so that they could drink the traditional Paraguayan tea while they were waiting.

A.1 Game Protocol

This protocol is closely related to that employed by Barr, Barrett, Bolyanatz, Cardenas, de la Pena, Ensminger, Gil-White, Gurven, Gwako, Henrich, Johnson, Marlowe, McElreath, Lesorogol, Patton, and Tracer in their project "The Roots of Human Sociality: An Ethno-Experimental Exploration of the Foundations of Economic Norms in 16 Small-Scale Societies".

INTRODUCTORY COMMENTS

Thank you all for taking the time to come today. Today's games may take 2 to 3 hours, so if you think you will not be able to stay that long let us know now. Before we begin I want to make some general comments about what we are doing here today and explain the rules that we must follow. We will be playing games with money. Whatever money you win will be yours to keep and take home. I will be supplying the money. You should understand that this is not my own money. It is money given to me by the University of California to use for research. There are many researchers in different countries in North America, South America, Asia, and Africa playing these same games.

Before we proceed any further, let me stress something that is very important. Many of you were invited here without understanding very much about what we are planning to do today. If at any time you find that this is something that you do not wish to participate in for any reason, you are of course free to leave whether we have started the game or not.

We will be playing two games here today. If you have heard anything about any other games, you should try to forget about that. These games are completely different. It is important that you listen as carefully as possible, because only people who understand the games will actually be able to play. We will run through some examples here while we are all together. You cannot ask questions or talk while here in the group. This is very important. Please be sure that you obey this rule, because it is possible for one person to spoil the game for everyone. If one person talks about the game while sitting in the group, we would not be able to play the game today. Do not worry if you do not completely understand the game as we go through the examples here in the group. Each of you will have a chance to ask questions in private to be sure that you understand how to play.

After we have explained the first game, you will all go outside and wait while I call you in one at a time to play. While you are outside you can talk about soccer, medicinal herbs, or anything else you want other than the games played here today. Fulgencio, Ever and Vicente will be waiting with you all and if they hear you talking about the game then you will not be allowed to play.

INSTRUCTIONS FOR THE FIRST GAME [*i.e. the risk game*]

This game is played by one person alone. I will give 8,000 Guaranies to each

player to start the game. The player will then have the opportunity to bet a share of this money. The player can bet 8,000, 6,000, 4,000, or 2,000 Guaranies, or can choose not to bet. After the player decides how much money he would like to bet, I will roll a six-sided die. If the die lands on one, the player will lose the money he bet. If the die lands on two, the player will lose half of the money he bet. If the die lands on three, the player will recoup his bet, thus he will neither lose nor win money. If the die lands on four, the player will receive 1.5 times his bet. If the die lands on five the player will double his bet, and if the die lands on six the player will win 2.5 times his bet. Thus, rolls of one and two are bad, a roll of three is neither good nor bad, and rolls of four, five, and six are good.

This is the end of the game. The player will go home with the share of the original 8,000 Guaranies he did not bet, plus whatever money he won in the bet. This game will only be played once with each person and then the game is over.

Here are a few examples [*These examples were all given using fake plastic money and a die. I gave the first four examples and an enumerator repeated the above instructions and then gave the last three examples.*]:

(1) Imagine that the player bets 8,000 Guaranies. He is left with no money. Laura throws the die. The die lands on 3. This means that Laura will give the player back his original bet. Thus the player will return home with 8,000 Guaranies.

(2) Now we will try another example. Imagine that the player bets 6,000 Guaranies. He is left with 2,000 Guaranies. Laura throws the die. The die lands on 2. This means that the player loses half of his bet. The player

loses 3,000 Guaranies and Laura gives him back 3,000 Guaranies. Thus the player has the 2,000 Guaranies he didn't bet plus the 3,000 Guaranies that Laura gave back to him, and so he goes home with 5,000 Guaranies.

(3) Now we will try another example. Imagine that the player bets 4,000 Guaranies. He is left with 4,000 Guaranies. Laura throws the die. The die lands on 4. This means that Laura gives the player back his original bet plus an extra half of his original bet. This means she gives him 4,000 plus 2,000, i.e. 6,000 Guaranies. Thus the player has the 4,000 Guaranies he didn't bet plus the 6,000 Guaranies that Laura gave back to him, and so he goes home with 10,000 Guaranies.

(4) Now we will try another example. Imagine that the player bets 2,000 Guaranies. He is left with 6,000 Guaranies. Laura throws the die. The die lands on 5. This means that the player doubles his bet. The player bet 2,000, and 2 times 2,000 is 4,000 so Laura gives him back 4,000. Thus the player has the 6,000 Guaranies he didn't bet plus the 4,000 Guaranies that Laura gave back to him, and so he goes home with 10,000 Guaranies.

(5) Now we will try another example. Imagine that the player bets 6,000 Guaranies. He is left with 2,000 Guaranies. Laura throws the die. The die lands on 6. This means that the player doubles his bet, plus gets an extra half of his bet in addition. The player bet 6,000, and two times 6,000 is 12,000. He wins an additional extra half of his original bet, or 3,000 Guaranies. Thus Laura gives him 12,000 plus 3,000 or 15,000 Guaranies. Thus the player has the 2,000 Guaranies he didn't bet plus the 15,000 Guaranies that Laura gave back to him, and so he goes home with 17,000 Guaranies.

(6) Now we will try another example. Imagine that the player bets 8,000 Guaranies. He is left with nothing. Laura throws the die. The die lands

on 1. This means that the player loses his entire bet. Thus the player goes home with 0 Guaranies.

(7) Now we will try another example. Imagine that the player doesn't bet anything. He is left with all 8,000 Guaranies. There is no need for Laura to throw the die. The player goes home with 8,000 Guaranies.

Note that, the more money the player bets, the more he can win, but the more he can lose as well. He could go home with more or less than 8,000 Guaranies as a result. Please remember that you are not betting the money you may have brought with you in your pocket here today. The money you will be using to bet is money that I have given you for that purpose.

We will discuss a few more examples with you when it is your turn to come play. At that point you can ask any question you want. Please remember that while you are waiting you cannot talk about the game or you will be disqualified.

[*Then each person was taken in one at a time. There was another list of examples and test questions of which I went through as many as seemed necessary until the player understood the game. Then the player decided how much money to bet, and if he bet some positive amount I rolled the die. Then I gave him an IOU stating how much I owed him.*]

Now you must wait outside until all of the other players have played this game. Then we will play another game, and at the end of both games I will pay you. Remember that you cannot talk about the game while you are waiting.

INSTRUCTIONS FOR THE SECOND GAME [*i.e. the trust game*]

This game is played by pairs of individuals. Each pair is made up of a Player 1 and a Player 2. Each of you will play this game two times, once as a Player 1 and once as a Player2. Each of the two times you play it will be with a different person. You will be playing with someone from your own village. However, none of you will know exactly with whom you are playing. Only I know who is to play with whom and I will never tell anyone else. It is important for you to remember that each time you play will be with a different person. When you play as Player 1, you will play with one person from this room. When you play as Player 2 you will be playing with a totally different person.

I will once again, as in the previous game, give 8,000 Guaranies to each Player 1. Player 1 then has the opportunity to send a portion of his 8,000 Guaranies to Player 2. He could send 8,000, or 6,000, or 4,000, or 2,000, or nothing. I will triple whatever amount Player 1 decides to give to Player 2 before it is passed on to Player 2. Player 2 then has the option of returning any portion of this tripled amount to Player 1. Then the game is over.

I will triple any money that Player 1 decides to send to Player 2 before it is put in an envelope. Each envelope has a different symbol on it, such as a circle, triangle, square, etc. You can try to remember the symbol on your envelope, but if you don't I will remember it. It is extremely important not to tell anyone the symbol on your envelope. If you are sending money to Player 2, I will put the tripled amount into the envelope with your symbol on it, if you are not sending money to player 2, the envelope with your symbol on it will remain empty.

After every player has decided how much, if any, to put into the envelope with his symbol on it I will shuffle all the envelopes. Then, each of you will come

into the room one at a time, and you will be assigned the envelope that is on the top of the stack. You will not receive your own envelope; it will be the envelope that another player in this room has sent. [*This stack of envelopes was placed behind some kind of border, so that the player could not see how thick they were before we elicited his strategies.*] You will then decide how much (if any) of the money in the envelope you want to keep and how much (if any) you want to leave in the envelope to be returned to the person who placed the money there.

After every player has decided what to do with the money in the envelope and opened an envelope to do as he precommitted to doing, I will call you into the building one last time one at a time to open up your original envelope and see how much, if any, money is left in it. Thus in playing the role of Player 1, the player will go home with whatever he kept from his original 8,000 Guaranies, plus anything returned to him by Player 2. In playing the role of Player 2 he goes home with whatever was given to him by Player 1 and then tripled by me, minus whatever he returned to Player 1. Then I will pay you the amount I owe you from both the first and second games.

Here are some examples [*I worked through these examples having all the possibilities laid out in front of people. When each hypothetical Player 1 made their choice I visually showed the effect of tripling the money and putting it in the envelope. Then I visually showed Player 2 opening the envelope and making his decision. I gave the first three examples and the enumerator repeated the above instructions and gave the last two examples.*]:

(1) Imagine that Player 1 gives 8,000 Guaranies to Player 2. Laura triples this amount, so Player 2 gets 24,000 Guaranies (3 times 8,000 equals 24,000).

At this point, Player 1 has nothing and Player 2 has 24,000 Guaranies. Then Player 2 has to decide whether he wishes to give anything back to Player 1, and if so, how much. Suppose Player 2 decides to return 6,000 Guaranies to Player 1. At the end of the game Player 1 will go home with 6,000 Guaranies and Player 2 will go home with 18,000 Guaranies.

(2) Imagine that Player 1 gives 6,000 Guaranies to Player 2. Laura triples this amount, so Player 2 gets 18,000 Guaranies (3 times 6,000 equals 18,000). At this point, Player 1 has 2,000 Guaranies and Player 2 has 18,000 Guaranies. Then Player 2 has to decide whether he wishes to give anything back to Player 1, and if so, how much. Suppose Player 2 decides to return nothing to Player 1. At the end of the game Player 1 will go home with 2,000 Guaranies and Player 2 will go home with 18,000 Guaranies.

(3) Imagine that Player 1 gives 4,000 Guaranies to Player 2. Laura triples this amount, so Player 2 gets 12,000 Guaranies (3 times 4,000 equals 12,000). At this point, Player 1 has 4,000 Guaranies and Player 2 has 12,000 Guaranies. Then Player 2 has to decide whether he wishes to give anything back to Player 1, and if so, how much. Suppose Player 2 decides to return 6,000 Guaranies to Player 1. At the end of the game Player 1 will go home with 10,000 Guaranies and Player 2 will go home with 6,000 Guaranies.

(4) Imagine that Player 1 gives 2,000 Guaranies to Player 2. Laura triples this amount, so Player 2 gets 6,000 Guaranies (3 times 2,000 equals 6,000). At this point, Player 1 has 6,000 Guaranies and Player 2 has 6,000 Guaranies. Then Player 2 has to decide whether he wishes to give anything back to Player 1, and if so, how much. Suppose Player 2 decides to return 4,000 Guaranies to Player 1. At the end of the game Player 1 will go home with

10,000 Guaranies and Player 2 will go home with 2,000 Guaranies.

(5) Imagine that Player 1 doesn't send anything to Player 2. There is nothing for Laura to triple. Player 2 gets 0 Guaranies and so can't return anything. At the end of the game Player 1 will go home with 8,000 Guaranies and Player 2 will go home with nothing.

Note that the larger the amount that Player 1 gives to Player 2, the greater the amount that can be taken away by the two players together. However, it is entirely up to Player 2 to decide what he should give back to Player 1. The first player could end up with more than 8,000 Guaranies or less than 8,000 Guaranies as a result.

We will go through more examples with each of you individually when you come to play the game. In the meantime, do not talk to anyone about the game. Even if you are not sure that you understand the game, do not talk to anyone about it. This is important. If you talk to anyone about the game while you are waiting to play, we must disqualify you from playing.

Now I will call in each person one by one to decide whether or not to send any money to the other anonymous player, and if so, how much. After all of you have played as Player 1 and decided what to do with your envelope I will come back out to shuffle the envelopes and then redistribute them. Then each of you will come in a second time to play as Player 2.

[*Then I brought in each player one by one and used more examples from a list of examples and asked some test questions until the person understood.*]

First player: Now you will play as Player 1. Here are your 8,000 Guaranies. [*At this point 8,000 Guaranies are placed on the table in front of the player.*]

You should hand me the amount of money you want to be tripled and passed on to Player 2. You can give me nothing, 2,000 Guaranies, 4,000 Guaranies, 6,000 Guaranies, or 8,000 Guaranies. Player 2 will receive this amount tripled by me. Remember the more you give to Player 2 the greater the amount of money at his or her disposal. While Player 2 is under no obligation to give anything back, we will pass on to you whatever he or she decides to return. [*Now the player hands back whatever he or she wants to have tripled and passed to player 2.*]

Second player: Now you are playing as Player 2. Before you get to look at the envelope which is assigned to you I will ask you how much you would keep and how much you would give back depending on how much money you find in the envelope. Whatever you say now will be binding when you actually open the envelope. Remember you can return nothing or keep nothing or anything in between. So, if Player 1 put 2,000 Guaranies in the envelope, and I tripled it, so that you open the envelope and find 6,000 Guaranies inside, what will you do with the 6,000 Guaranies? [*Write down their response.*] If player 1 put 4,000 Guaranies in the envelope, and I tripled it so you find 12,000 Guaranies in the envelope, what will you do with the 12,000 Guaranies? [*Write down the response.*] If player 1 put 6,000 Guaranies in the envelope, and I tripled it so you find 18,000 Guaranies in the envelope, what will you do with the 18,000 Guaranies? [*Write down the response.*] If player 1 put 8,000 Guaranies in the envelope, and I tripled it so you open it and find 24,000 Guaranies, what will you do with the 24,000 Guaranies? [*Write down the response.*] Here is the envelope that is assigned to you. You can now open it and count the money inside. How much is in it? You said that if you found X Guaranies you would keep Y and return Z. Please take Y out of the envelope and put Z back in.

B Description of Variables

- Brazilian – A dummy for players of Brazilian heritage. One villages was entirely Brazilian while another was a mixture of Brazilians and Paraguayans.
- Distance to bus – Kilometers the closest house in the village was to a bus route. In only three of the villages was the answer positive.
- Donations – The sum of money a household donated to the church and communal projects such as electrification, road repair etc. as well as the number of days of work they donated (without pay) to the church and communal projects where a day of work was valued at 12,000 Guaranies per day. Here we use log(((monetary donations + 12,000*work donations)/1,000) +1).
- Gifts – The total value of all agricultural or animal products a household produced that it gave to family and friends. Here we use log((gifts/1,000)+1).
- Guarani – Paraguay is officially bilingual, with all schools taught in both Spanish and Guarani. It is not the case that those who speak Guarani at home have more indigenous heritage. The survey asked which language was spoken most at home. The Brazilian immigrant population speaks German or Portuguese and the Paraguayan population speaks either Guarani, Spanish, or both at home.
- New households – The number of new households which moved into the village in the past 3 years (from the community survey).
- P.I. at survey – A dummy for whether I sat in on the survey with that household. I attended surveys with a different enumerator each day, alternating between the three and there was no specific type of household I tended to visit more.
- Wealth – This is the sum of the value of the land, tools, and animals they own. Here we use log(wealth/1,000).

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