Preferences Over Social Risk

by

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Abstract. We elicit individual preferences over social risk. We identify the extent to which these preferences are correlated with individual preferences over individual risk and individual preferences over the well-being of others. We examine these preferences in the context of laboratory experiments over small, anonymous groups, although the methodological issues extend to larger groups that form endogenously (e.g., families, committees, communities). We find that social risk attitudes can be closely approximated by individual risk attitudes. We find no evidence that subjects systematically reveal different risk attitudes in a social setting compared to when they solely bear the consequences individually.

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Many of the decisions that affect the bearing of risk by individuals are taken socially. Public policies reflect the outcome of some political process, family decisions reflect the outcome of some household decision process, and committee decisions reflect the outcome of some formal or informal rules of conduct. Are these decisions reflections of individual preferences towards individual risk, individual preferences towards the well-being of others, the particulars of the decision process, or something else altogether? We approach to these questions by asking whether individual preferences towards own individual risk differ from those expressed towards social risk for a group.

We evaluate preferences over social risk by considering the simplest possible case. Anonymous groups are combined exogenously, and asked to express individual preferences over the risk that everyone in the group will bear. We consider groups of three, and use simple majority rule over binary choices to ensure transparent incentives to reveal preferences truthfully. The methodological issues we examine should extend directly to groups that form endogenously, such as families, committees and communities, and form a behavioral baseline for evaluating the effects of selection into groups.

One feature of our approach is an attempt to identify the source of individual preferences over social risk using complementary tasks. One such task elicits individual preferences over individual risk, using methods developed by Holt and Laury [2002] and others. Another task elicits individual preferences over deterministic allocations of money to another person, using methods developed by Eckel and Grossman [1996], Andreoni and Miller [2002] and others to identify altruistic preferences. If altruism is an aspect of what motivates individual choice, then it is possible that social risk preferences differ from individual risk preferences for individuals who perceive themselves as different from others. If individuals care about the welfare of others in their group, it is not unlikely that what will motivate them is the utility, rather than the monetary payoffs, of others. To exemplify, a highly risk averse individual may be willing to give up some of his own utility by taking on more risk in a social setting than in an individual setting in order to avoid imposing more risk on others than

they prefer.

All three tasks are undertaken for the same subjects: elicitation of individual risk preferences, altruistic preferences, and social risk preferences. We also collect information on individual characteristics, to help us control for sampling heterogeneity in the assignment to treatment and identify differences in our conclusions associated with observable characteristics.

We also consider the possibility that the social risk preferences of subjects depend on the expected individual risk attitude of others. This is a possibility whether or not subjects are altruistic, if, for example, they are concerned about social visibility and simply do not want to appear different from others. For example, if I am extremely risk loving when it comes to decisions for which I am the only one to bear the consequences, I might want to behave in a risk neutral or risk averse way when paired with people that I expect are significantly less risk loving. But I may not know this about the risk attitudes of others. Thus we consider one treatment in which subjects are provided information on the individual risk preferences of the others in their group before they are all asked to vote for a risk preference for the group.

We find that elicited social risk attitudes closely track individual risk attitudes. Using an in-sample experimental design, and responses from 108 subjects in laboratory experiments that were conducted at the University of Los Andes in Bogotá, Colombia, we do not detect any systematic differences between the two. Our design controls for order effects, informational effects, and variations in individual characteristics across treatments. We also find that social risk attitudes are generally risk averse, consistent with previous evidence on individual risk aversion in the laboratory here and elsewhere.[1]

Apart from the positive significance of eliciting social risk attitudes, the possibility of differences between social and individual risk attitudes has long-standing normative significance. In the tradition of Arrow [1973; p.256/7], Howe and Roemer [1981; p.885] characterize the choice between a Rawlsian conception of justice and Harsanyi's prescription for justice in terms of

[1] See Harrison and Rutström [2008] for a survey of evidence from the laboratory, and Harrison, Lau and Rutström [2007] for a review of evidence from the field.

assumptions on the risk attitudes of agents.[2] They view Rawls [1971] as assuming that individuals will exhibit extreme social risk aversion when making choices of social contracts behind a "veil of ignorance," and Harsanyi [1955] as assuming that they will exhibit social risk neutrality.[3] Thus Howe and Roemer [1981; p.885] posit that

> We can thus imagine a continuum of justice games. The ERA [Extreme Risk Aversion] game with its core of the maximin distribution is at one extreme; the RN [Risk Neutral] game with its core consisting of the maximal total income distribution is at the other extreme. Each of the games in this continuum can be thought of as one whose core describes the social contract for a society with some degree of risk aversion, going from totally risk averse to risk neutral. Under reasonable assumptions on preferences, total income increases as we proceed along this continuum of games to the RN game, reflecting the decreased insurance premium society pays as it sheds its aversion to risk.

Our experiments can be viewed as providing an operational counterpart of these justice games. Since we find evidence of social risk aversion, we reject the view that society will seek to maximize expected total income. However, our subjects certainly exhibit modest levels of social risk aversion, somewhere in between the two competing conceptions attributed to Rawls and Harsanyi. This inference is independent of any social preferences over deterministic outcomes, which might also apply to decisions about social contracts.

1. Experimental Design

A. The Elicitation Procedure for Risk Attitudes

We employ a simple experimental measure for risk aversion called a multiple price list (MPL) developed by Holt and Laury [2002] (HL). Each subject is presented with a choice between two

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[2] Rawls [2001; §31] explicitly rejects this formulation, in part because he does not view individuals in his "original position" behind a veil of ignorance as being able to formulate probabilities. Thus would couch this instead as an issue of aversion to ambiguity rather than aversion to risk. His objections, however, seem to stem from a confusion between rationality and risk attitudes: for example, he notes (p.110), that he views individuals as "acting rationally and not in a peculiarly risk-averse manner." Arrow [1973; p.251] points out that Rawls' original exposition of the relationship between his own conception of justice and utilitarianism seemed to miss "the fact that, at least in Vickrey and Harsanyi, the utilities are already so measured as to reflect risk aversion." Rawls' [1971; p.155] original conception quite clearly referred to income (or an index of primary goods) as the individual maximand, rather than utility or expected utility; see Howe and Roemer [1981; fn.1 and §V] for detailed discussion of this issue and its implications for inconsistency of the Rawlsian conception.

[3] Arrow [1973; fn.2, p.250] correctly identifies neglected classics by Vickrey [1945; §III][1960; p.523ff.] as providing characterizations consistent with those proposed independently by Harsanyi [1955].

lotteries, which we call A or B. Table 1 illustrates the basic payoff matrix presented to subjects. The first row shows that lottery A offered a 10% chance of receiving $50 and a 90% chance of receiving $40. The expected value of this lottery, EV^A, is shown in the fourth-last column as $41, although the EV columns were not presented to subjects. Similarly, lottery B in the first row has chances of payoffs of $96.25 and $2.50, for an expected value of $11.88. Thus the two lotteries have a relatively large difference in expected values, in this case $29.12.[4] As one proceeds down the matrix, the expected value of both lotteries increases, but the expected value of lottery B becomes greater than the expected value of lottery A.

The subject chooses A or B in each row, and one row is later selected at random for payout for that subject. The logic behind this test for risk aversion is that only risk-loving subjects would take lottery B in the first row, and only risk-averse subjects would take lottery A in the second last row. Assuming local non-satiation, the last row is simply a test that the subject understood the instructions, and has no relevance for risk aversion at all. Most subjects would be expected to switch from A to B on some row in the table, and this switching point can then be used to infer their risk attitude. A risk neutral subject should switch from choosing A to B when the EV of each is about the same, so a risk-neutral subject would choose A for the first four rows and B thereafter.

These data may be analyzed using a variety of statistical models. Each subject made 10 responses. The responses can be reduced to a scalar if one looks at the *lowest* row in Table 1 at which the subject "switched" over from lottery A to lottery B.[5] This reduces the response to a scalar for each subject and task, but a scalar that takes on integer values between 0 and 10. Alternatively, one could study the effects of experimental conditions in terms of the constant relative risk aversion (CRRA) characterization, employing an interval regression model. The CRRA utility is defined as $U(y) = (y^{1-r})/(1-r)$, where r is the CRRA coefficient.[6] The dependent variable in the interval

[4] At the time of the experiments the exchange rate was approximately 2500 Colombian pesos for 1 US dollar.

[5] Some subjects switched back and forth several times, but the minimum switch point is always well-defined. One explanation of such multiple switching behavior is simply indifference. Evidence collected by Andersen, Harrison, Lau and Rutström [2006] supports this interpretation of switching behavior.

[6] With this parameterization, $r = 0$ denotes risk neutral behavior, $r > 0$ denotes risk aversion, and $r < 0$ denotes risk loving. When $r = 1$, $U(m) = \ln(m)$.

regression model is the CRRA interval that subjects implicitly choose when they switch from lottery A to lottery B. For each row of Table 1, one can calculate the implied bounds on the CRRA coefficient. These intervals are shown in the final column of Table 1. Thus, for example, a subject that made 5 safe choices and then switched to the risky alternatives would have revealed a CRRA interval between 0.15 and 0.41, and a subject that made 7 safe choices would have revealed a CRRA interval between 0.68 and 0.97, and so on.

B. The Elicitation Procedure for Altruistic Preferences

A simple Dictator task is used to elicit individual preferences over deterministic allocations to another person, following Eckel and Grossman [1996] and Andreoni and Miller [2001]. This task asks one subject to allocate an endowment between themselves and one other anonymous person. The Dictator "game" does not allow the recipient to engage in any strategic behavior which might affect the outcome, since this would confound the interpretation of the allocation as reflecting altruistic preferences (Cox [2004]).

Subjects that had randomly picked an even ID number were asked to allocate a random endowment between themselves and one other person in the room, picked from those with odd ID numbers. The random endowment was determined individually by adding a number generated by the roll of a 10-sided die, with numbers between 1 and 10, to an initial stake of $15. Thus the random endowment was between $16 and $25, and varied from subject to subject within each session. The subjects were simply told to write down how much they wanted to "hold" and how much they wanted to "pass."[7] This simple task was intended to elicit some measure of altruism towards others in the session, stripped of the context of deciding about social risk.

C. Treatment Sequence

In our experimental design we use the basic individual risk aversion (iRA) instrument directly

[7] In Spanish these key words were "guardo" and "entrego."

with each subject. We also implement a group risk aversion (gRA) instrument using the same structure. In this case each subject is placed in an anonymous group of 3. Each person must "vote" for which lottery they would choose in each row, knowing that the social choice will simply be the lottery that obtained the most votes in each row if that row is picked for implementation. Thus the task is identical to the iRA task in all respects, other than the social manner in which the individual's response affects the outcomes he will face.

We implemented three treatments over 6 sessions. The iRA/gRA treatment gave subjects the iRA instrument before the gRA instrument, the gRA/iRA treatment reversed this order, and the iRA/gRA* instrument provided subjects in the group risk aversion task with information on the individual risk aversion elicited in the earlier task.

In each session the subject was initially asked to answer some questions about individual characteristics, such as age, sex, ethnic category, urban residence, residence type, academic major, class standing, sources of finance for tuition expenses, usual mode of transportation to campus, marital status, size of household, personal and household income, work status, hourly wage if working, and whether they were a smoker.

After this questionnaire each subject was given the Dictator task. Only half of the subjects were dictators, the other half being recipients of the money given by the dictators. After the Dictator task the subjects were presented with the two risk aversion tasks in the order dictated by their treatment.

D. Related Literature

Frohlich and Oppenheimer [1992] report a remarkable series of experiments in which subjects were able to choose rules that determined their final income distributions from experiments. They find that subjects generally mix principles of justice, by choosing a fixed income floor for each subject while encouraging subjects to maximize incomes above that floor. They note (p.29) their results are strikingly consistent with the conception of justice games offered by Howe and Roemer

[1981]:

> One implication of their analysis is that if the individuals choosing a principle exhibit a moderate degree of risk aversion, there will be an identifiable core of the game. The core would consist of the mixed principle of setting a floor (funded presumably via the necessary tax) and otherwise allowing incomes to be unconstrained. The subsequent diversity of income potential would allow for the (constrained) maximization of group income. Whereas Rawls assumed a high degree of risk aversion, Harsanyi assumed risk neutrality. But because populations of individuals have a variety of risk propensities and expectations, both theoretical and empirical reason lead one to believe that the principle most likely to be chosen would be a mixed principle.

Frohlich and Oppenheimer [1992; p.169, 172] do go on to reject the social risk aversion explanation for this outcome offered by Howe and Romer [1981], although this is not tested directly.[8]

Shupp and Williams [2008] directly test for differences in individual and group decisions over risk. Their basic design to detect differences used 9 valuation tasks, in which the decision-making unit was asked to state a maximum willingness to pay for each of 9 lotteries. In one treatment the decision-making unit was an individual and the lottery prizes were $20 and $0, and in the other treatment the decision-making unit was a group of 3 and the lottery prizes were $60 and $0 (to be divided equally between the three). Each group was free to discuss the valuations to be entered, so their groups engaged in open communication. This is an appropriate procedure if one is interested in eliciting the decision that a group makes about social risk, but does not provide information on individual preferences about social risk. Both are interesting, but different. The 9 lotteries differed by the chance of winning the bigger prize, from 10% up to 90% in increments of 10%. Subjects are given an incentive to truthfully reveal their valuation since their stated selling prices are compared to randomly drawn buying prices to decide if they get to play out the lottery or receive the certainty-equivalent.[9]

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[8] The spirit of their rejection of this explanation is anecdotal summary of the language used during the negotiations, which of course is hard to interpret. Their design did include (p.209) two open-ended, hypothetical questions designed to provide some proxies for individual risk aversion, but they do not appear to use these responses in formulating their conclusions about the social risk aversion explanation.

[9] This basic procedure was originally developed by Becker, DeGroot and Marschak [1964], and was modified for use by Harrison [1986] to test for risk aversion. His design was later used by Kachelmeier and Shehata [1992] in a similar exercise. The basic idea is to endow the subject with a series of lotteries, and to ask for the "selling price" of the lottery. The subject is told that a "buying price" will be picked at random, and that if the buying price that is picked exceeds the stated selling price, the lottery will be sold at that price and the subject will receive that buying price. If the buying price equals or is lower than the selling price, the subject keeps the lottery and plays it out. It is relatively

Their results display a striking heteroskedasticity effect from the main treatment. For low probabilities of winning the high prize, the elicited valuations from individuals varied wildly, consistent with considerable evidence that subjects facing low probabilities of the high prize, and hence low expected values for the lottery, are extremely poorly motivated with this procedure for encouraging truthful responses.[10] The group valuations do not vary wildly, which is an interesting finding in itself. Mean and median valuations for individuals and groups indicate risk aversion for low probability levels, tending clearly towards risk neutrality for the higher probabilities. Median valuations for the two treatments are virtually identical, but mean individual valuations are lower than those for group valuations when the probabilities of the high prize are low. However, the standard deviation of the individual valuations is huge in this domain. It would be unlikely that there is any statistically significant difference between responses, although one would need to use appropriate panel statistics to verify that claim.[11]

Baker, Laury and Williams [2008] use the Holt and Laury [2002] procedure to identify the effects of individual and group behavior. They conducted new experiments in which groups of 3 were asked to make unanimous decisions about a payoff matrix akin to the one we use. In fact, payoffs were 10 times the baseline used in Holt and Laury [2002]. They compared these group data to individual responses over payoffs at the same level, collected in another study by Laury, and found no statistically significant difference. Their group decisions were, again, "committee decisions" arrived at after allowing subjects to talk for up to 20 minutes.[12] Thus these are group decisions, but there is no

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transparent to *economists* that this auction procedure provides a formal incentive for the subject to truthfully reveal the certainty-equivalent of the lottery.

[10] See Harrison [1992] for a general statement of the poor incentive properties of the procedure, and Kachelmeier and Shehata [1992] for some stunning evidence in risk aversion experiments.

[11] Shupp and Williams [2008; Table 1] undertake unconditional statistical analyses for each lottery, choosing not to pool data across lotteries. Their ordinary least squares regression model does not account for the fact that the dependent variable ratio they use, the elicited certainty-equivalent selling price divided by the expected value, is bounded below at 0. Given the size of the standard deviations reported (Figure 3), this suggests the need to use some tobit regression specification. Pooling across probabilities would also require that one correct for panel effects, but that is a standard matter using random effects or even fixed effects specifications. Pooling would also require statistical attention to the obvious heteroskedasticity with respect to probabilities and treatments.

[12] They also conducted an experiment in which the same subjects provided individual responses, then group responses, and then individual responses in a sequence. These choices were at the baseline payoffs of Holt and Laury [2002]. Of course, in this design the group responses are confounded by an order effect, shown by Harrison, Johnson, McInnes and Rutström [2005] to be quantitatively significant.

presumption that they reflect the true social risk attitudes of individuals since there is no clear incentive for truthful revelation of attitudes.

Colombier, Denant-Boemont, Loheac and Masclat [2009] also use the Holt and Laury [2002] framework, and compare choices made by individuals and groups of 3. Their group decision procedure was a multi-stage voting game. If all three agreed on what choice to make in a row, the group decision was made. If not, information about the previous vote was revealed, and another voting round begun. If unanimity had not been reached by voting round 5, subjects knew that the decision would be made at random by a computer. This procedure is not incentive compatible. At the very least, individual risk attitudes over own income would affect the strategic process, as relatively risk averse individuals would be inclined to "cave in" earlier in the process. However, knowing this, those that believe themselves to be more or less risk averse than the average might strategically distort their choices in early rounds. Thus inferences from behavior under such an institution might be telling us more about strategic responses to the multi-stage voting procedure as much as the true social risk attitudes of individuals.

Rockenbach, Sadrieh and Mathauschek [2007] compare individual and team decisions over risky lotteries, and find that teams exhibit less risk aversion. They elicited group choices over pairs of lotteries, and the evaluation of specific lotteries, by requiring subjects to all agree on the decision. No restrictions were placed on discussions within the group, nor was there any time limit on discussion. Thus their group decisions are more like 3-person bargaining outcomes than 3-member voting outcomes, and there is no presumption that individual preferences over social risk are revealed by the group decision (nor was that their design objective).

2. Experimental Procedures

Our experiments were conducted at the Faculty of Economics of the University of Los Andes in Bogotá, Colombia.[13] Students were recruited from the whole campus, although the majority

[13] See http://ingles.uniandes.edu.co/ for information in English on the university and it's surrounds.

of subjects were from Engineering. We recruited 108 subjects, split equally into 36 for each of the three treatments.

Our sample was predominantly male (70%), with an average age of 20.8 years, lived most of their life in an urban area (88%), currently lived in an owner-occupied house or apartment (79%), used the bus to get to the university (69%), lived in a large household of 4 or more people (67%), with high household income (70%), relied on their family as the main source of funding for tuition fees (81%), had economics or engineering as major (78%), and studied three years or less (44%). Using ethnic categories appropriate for this culture, 51% reported being White, 37% reported being Spanish-Indian, and 8% reported being Spanish-African.[14] We control for each of these individual characteristics in our statistical analysis.

All instructions were given to subjects in Spanish, and the experimenter was a native of Colombia. To begin the sessions, subjects were welcomed and reminded that they were to be paid $5 for their participation. Instructions for the experiment were provided on paper, and subjects read through the instructions while the experimenter read them aloud.

The experiment was conducted in four parts. Part I consisted of the questionnaire collecting subjects' socio-demographic characteristics. Part II consisted of the Dictator task where subjects with an even ID number allocated a random endowment between themselves and another subject in the room with an odd ID number. These payments were anonymous and announced to each subject before they were presented with the two risk aversion tasks in Part III and IV.

The risk aversion tasks incorporate the incentive structure described earlier. After subjects completed each risk aversion task, several random outcomes were generated in order to determine subject payments. For all subjects, one of the decision rows in the task was chosen, then another random draw determined whether subjects were to receive the high payment or the low payment. Finally, a 10-sided die was rolled for each subject. Any subject who received a roll of "0" received

[14] In Spanish, these three categories were listed as "Blanco," "Mestizo (mezcla blanco-indio)" and "Mulato (mezcla blanco-negro)," respectively.

actual payment according to the final outcome. Groups were randomly selected using playing cards, and record sheets were distributed to subjects so they could verify the social decisions taken in their group when the random outcomes were generated. All payments to subjects were made in cash at the end of the experiment.

3. Results

We find that 81% of the subjects picked at random to be a Dictator exhibited some degree of altruism towards others subjects by contributing a positive amount. The average pass rate was 27%, and the distribution across the 54 Dictators is shown in Figure 1. Consistent with the comparable treatments in Andreoni and Miller [2001], the modal choice was to pass nothing. But 22% of subjects passed either 40% or 50% precisely, and one generous subject passed 85%. These data therefore provide evidence of a rich distribution of altruistic preferences, consistent with most of the previous experimental literature.

Our main conclusion is that social risks attitudes are virtually identical to individual risk attitudes, despite the prevalence of altruism. Figure 2 displays the main results from the experiment, in terms of the average choices of subjects in each row. On the bottom axis we list each problem, corresponding to the rows in Table 1. The vertical axis shows the fraction of choices of the safe lottery, option A. The dashed line displays what a risk neutral subject would do: pick the safe lottery A until the EV of the risky lottery B is greater than the EV of lottery A, and then pick lottery B. The other lines show the observed responses, pooled over the task order and other treatments, which we control for in a formal statistical analysis below. Subjects that pick the safe option more than the risk neutral prediction are risk averse, as discussed earlier. So we see evidence that subjects are risk averse when making decisions about their own money, and have virtually the same preferences when making a decision about the group's money.[15] Of course, these lines only reflect averages, and there is

[15] Baker, Laury and Williams [2008; Figure 1] report a similar picture, but with the line for the group decisions being lower (higher) than the line for individual decisions for low (high) probabilities. This corresponds to a form of heteroskedasticity in responses, since the average risk attitude will be the same but will have a lower variance for the individual responses. We find no evidence of this in our experimental data, although our procedures differed in the

typically more noise around the "middle" of these pictures, so this conclusion must await a more formal statistical analysis.

Figure 3 displays the raw data in terms of the mid-points of the elicited CRRA intervals in iRA and gRA tasks. The sample sizes are less than 108 in each panel, since some subjects gave responses that led to their CRRA interval being (-∞, -1.71) or (1.37, ∞), so a mid-point could not be defined.[16] The averages from these two distributions are 0.47 and 0.46, and the standard deviations are 0.48 and 0.42, so these two distributions are statistically indistinguishable.

Figure 4 displays estimates of CRRA in the iRA and gRA tasks, derived from predictions from an interval regression model of each task. In this model controls for treatments and individual demographics are included, to correct for any differences in sampling across treatments. The interval regression model also naturally handles the intervals that are dropped from the raw data in Figure 3, and generates a prediction for those subjects based on the interval they report, their treatments and individual characteristics, and estimates for the rest of the sample. The disadvantage is that one loses the raw heterogeneity of the responses shown in Figure 3. The averages are again virtually identical for the main comparison: 0.59 and 0.57, respectively.[17]

Our main conclusion is robust to extensions to the statistical analysis. Table 2 displays the results from estimating a panel interval regression model of the elicited CRRA values in the experiments. This model uses panel data since each subject provided two responses, one for each individual and social task. Controls for the order of presentation, the elicitation of social risk rather than individual risk, and the provision of information on individual risk attitudes by other subjects in the group have no effect on the conclusion: none of the variables are large or statistically significant. The same conclusion holds true when we add information on individual characteristics.[18]

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manner explained earlier.

[16] In the iRA task, 7 responses led to the CRRA interval being (-∞, -1.71), 17 responses led to (1.37, ∞) and 2 observations led to (-∞, ∞). In the gRA task we observe less extreme observations: 3 responses led to the CRRA interval being (-∞, -1.71), 12 responses led to (1.37, ∞) and 2 observations led to (-∞, ∞).

[17] The averages are higher in Figure 4, since Figure 3 loses more subjects who were extremely risk-averse than were extremely risk-loving, and these are included in Figure 4, resulting in a higher predicted average CRRA.

[18] To check for the possibility of interaction effects between the main treatment and the probability of winning the high prize, given the findings in Shupp and Williams [2008], we also estimated this model with data just from the "left side" of Figure 2 and then just from the "right side" of Figure 2, and our conclusions are unchanged.

There appears to be no effect of our measure of individual altruism. If we restrict the sample to those subjects that provided evidence of some altruism there is still no significant effect of risk attitudes being elicited in a social setting rather than an individual setting. Brennan, González, Güth and Levati [2008] also report experimental evidence that altruism and individual risk attitudes appear not to be correlated.

4. Conclusions

Social risk attitudes expressed over group outcomes can be closely approximated by individual risk attitudes. We find no evidence that subjects systematically reveal different risk attitudes in a social setting compared to when they solely bear the consequences individually. Of course, our group size was small (N=3), and stakes were endowed rather than earned. There is ample evidence that each of these factors could affect behavior in a social context.[19] Furthermore, the influence of self-selection into groups should be studied.

These findings are particularly interesting in comparison with a recent study by Chakravarty, Harrison, Haruvy, and Rutström [2010], where subjects display a significant difference in risk attitudes between decisions over their own or others risky earnings. One explanation of these different findings is that when making decisions for others, as in Chakravarty et al. [2010], it is more like making decisions in hypothetical settings, where monetary incentives are lacking. In such situations, other motivations, including social perceptions, may dominate. What our findings here tell us is that, in the presence of financial consequences to the decision maker, such other motivations, if they exist, are dominated by financial ones.

[19] For example, Isaac and Walker [1988] and Isaac, Walker and Williams [1994] examine the effects of group size on contribution rates in deterministic public goods games, and Rutström and Williams [2000] and Cherry, Frykblom and Shogren [2002] examine the effects of earned stakes on expressions of altruism.

Table 1: Payoff Table for Risk Aversion Experiments

Lottery A				Lottery B				EV^A	EV^B	Difference	Open CRRA Interval if Subject Switches to Lottery B
p($50)		p($40)		p($96.25)		p($2.50)					
0.1	50	0.9	40	0.1	96.25	0.9	2.50	41	11.87	29.12	-∞, -1.71
0.2	50	0.8	40	0.2	96.25	0.8	2.50	42	21.25	20.75	-1.71, -0.95
0.3	50	0.7	40	0.3	96.25	0.7	2.50	43	30.62	12.37	-0.95, -0.49
0.4	50	0.6	40	0.4	96.25	0.6	2.50	44	40.00	4.00	-0.49, -0.15
0.5	50	0.5	40	0.5	96.25	0.5	2.50	45	49.37	-4.37	-0.14, 0.14
0.6	50	0.4	40	0.6	96.25	0.4	2.50	46	58.75	-12.75	0.15, 0.41
0.7	50	0.3	40	0.7	96.25	0.3	2.50	47	68.12	-21.12	0.41, 0.68
0.8	50	0.2	40	0.8	96.25	0.2	2.50	48	77.50	-29.50	0.68, 0.97
0.9	50	0.1	40	0.9	96.25	0.1	2.50	49	86.87	-37.87	0.97, 1.37
1	50	0	40	1	96.25	0	2.50	50	96.25	-46.25	1.37, ∞

Note: The last four columns in this table, showing the expected values of the lotteries and the implied CRRA intervals, were not shown to subjects.

Table 2: Statistical Model of Risk Aversion Responses

Random-effects interval regression,
with the CRRA interval chosen by subjects as the dependent variable

N=198 choices by 107 subjects

Variable	Description	Estimate	Standard Error	*p*-value	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Constant		0.23	1.07	0.83	-1.86	2.33
Second	Second RA task	0.06	0.13	0.66	-0.20	0.31
Group	Social response	-0.02	0.05	0.67	-0.12	0.08
Ginfo	Provision of information on others' RA	0.13	0.12	0.31	-0.12	0.37
crra_g_dev	Diff. between own RA and group average	0.25	0.20	0.22	-0.15	0.64
female	Female	0.02	0.13	0.86	-0.24	0.29
age	Age	-0.01	0.04	0.83	-0.09	0.08
white	White	-0.07	0.12	0.54	-0.31	0.16
city	Lived in city of 1 million or more	-0.01	0.21	0.96	-0.42	0.40
owner	Own home or apartment	0.03	0.19	0.86	-0.34	0.40
economics	Economics	-0.02	0.18	0.92	-0.37	0.33
engineering	Engineering	0.12	0.14	0.43	-0.17	0.40
junior	Third year or less	0.02	0.20	0.90	-0.37	0.41
scholarship	Scholarship	0.29	0.20	0.15	-0.10	0.68
loan	Loan	-0.09	0.21	0.67	-0.50	0.32
bus	Bus	0.03	0.15	0.83	-0.26	0.32
large	Large household	0.22	0.15	0.15	-0.08	0.52
HLow	Low household income	0.23	0.22	0.29	-0.20	0.65
HMed	Medium household income	0.24	0.19	0.22	-0.14	0.62
dictator	Dictator	-0.25	0.61	0.68	-1.46	0.95
endowment	Endowment	0.01	0.03	0.78	-0.05	0.07
Dincome	Income from Dictator task	0.02	0.02	0.19	-0.01	0.05
σ_u	Standard deviation of individual effect	0.49	0.05	0.00	0.39	0.58
σ_e	Standard deviation of residual	0.30	0.03	0.00	0.24	0.36

Note: Log-likelihood value is -330.7; Wald test for the null hypothesis that all coefficients are zero has a χ^2 value of 12.39 with 21 degrees of freedom, implying a *p*-value of 0.93; fraction of the total error variance due to random individual effects is estimated to be 0.72, with a standard error of 0.065.

Figure 1: Pass Rate in Colombia Experiments

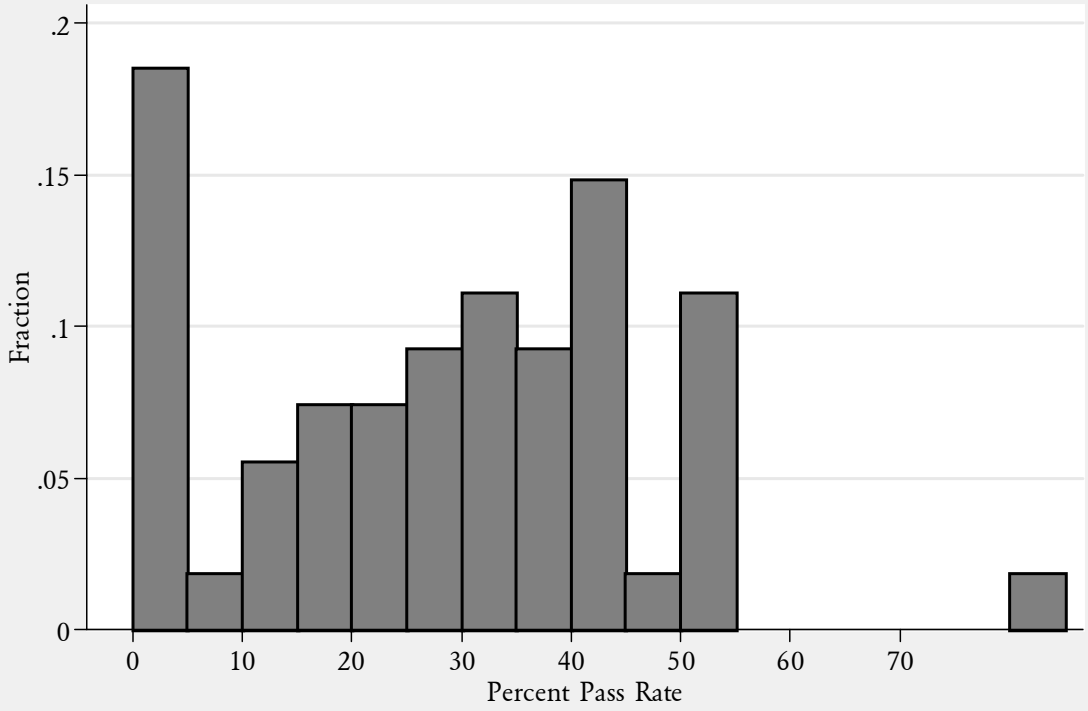


Figure 2: Choices in Risk Aversion Tasks

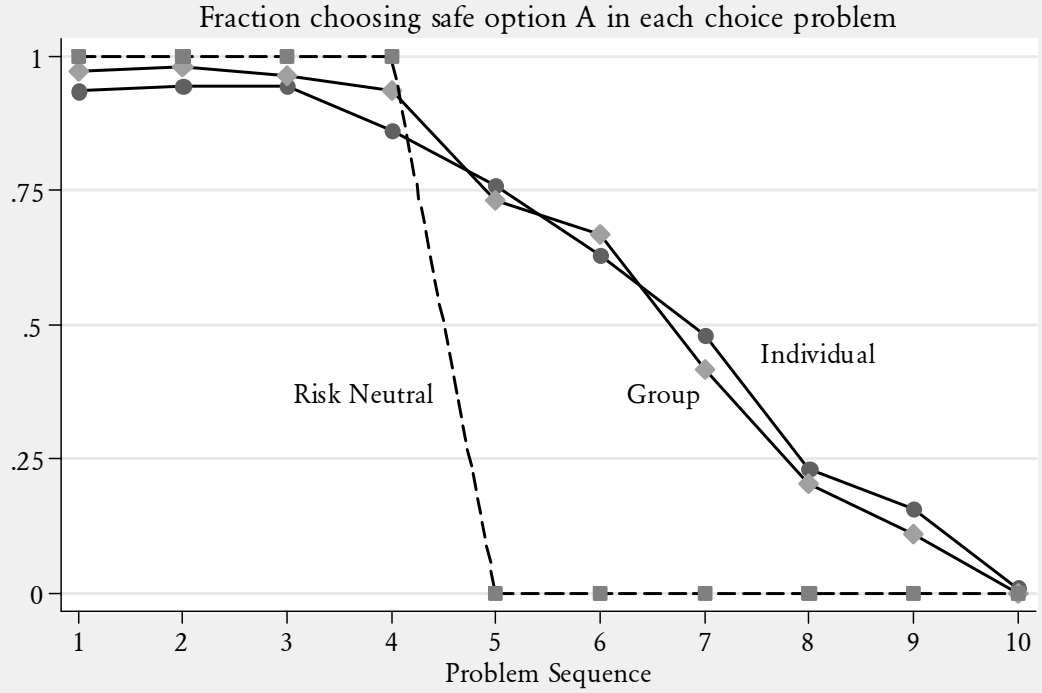


Figure 3:
Elicited Individual and Social Risk Aversion

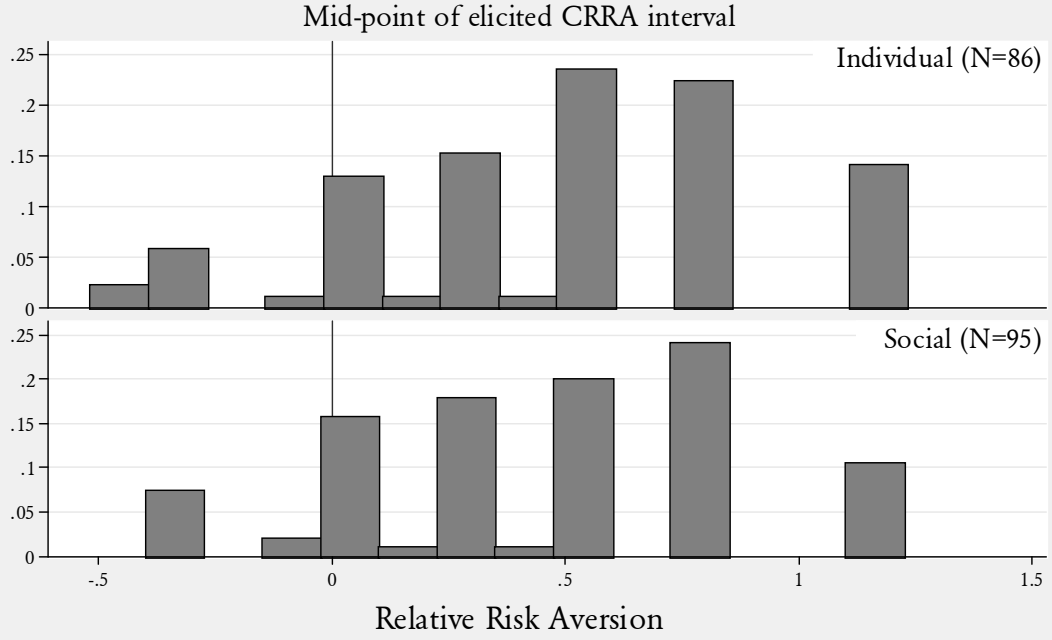
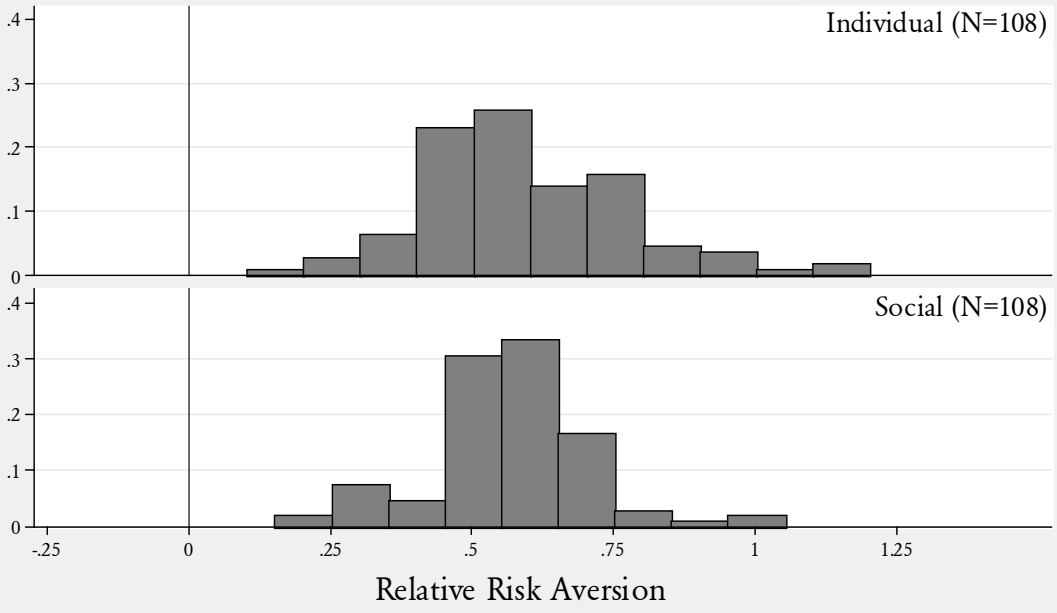


Figure 4:
Estimated Individual and Social Risk Aversion



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Appendix A: Experimental Instructions (NOT FOR PUBLICATION)

All instructions were administered in Spanish, and are contained in the *ExLab* Digital Archive, located at http://exlab.bus.ucf.edu. We present an English translation below, embedded in the written script that we used to conduct the session. A solid horizontal line indicates a page break in the original script and instructions.

All subjects received the questionnaire of individual characteristics in section A, and then were randomly assigned to one of the three treatments. The assignment to treatment, by subject ID, is listed below.

Session 1 (I,G)	Session 1 (I,G)	Session 2 (I,G)	Session 2 (I,G)	Session 3 (I,G*)	Session 3 (I,G*)
Dictator	Risk Group	Dictator	Risk Group	Dictator	Risk Group
2, 13	3, 6, 14	20, 23	20, 21, 30	38, 43	43, 45, 48
4, 17	7, 16, 18	22, 19	25, 26, 33	40, 47	41, 44, 49
6, 11	4, 5, 12	24, 29	23, 31, 32	42, 45	39, 46, 53
8, 15	1, 8, 13	26, 31	28, 35, 36	44, 39	37, 42, 50
10, 5	10, 15, 17	28, 35	22, 24, 27	46, 37	38, 40, 47
12, 3	2, 9, 11	30, 27	19, 29 34	48, 49	51, 52, 54
14, 9		32, 33		50, 53	
16, 1		34, 25		52, 51	
18, 7		36, 21		54, 41	

Session 4 (I,G*)	Session 4 (I,G*)	Session 5 (G, I)	Session 5 (G, I)	Session 6 (G, I)	Session 6 (G, I)
Dictator	Risk Group	Dictator	Risk Group	Dictator	Risk Group
56, 71	64, 68, 72	74, 87	80, 84, 87	92, 97	94, 96, 107
58, 65	59, 61, 70	76, 83	73, 79, 83	94, 101	93, 98, 102
60, 67	55, 62, 65	78, 77	86, 88, 89	96, 91	97, 101, 103
62, 69	58, 67, 71	80, 73	75, 81, 82	98, 103	91, 95, 104
64, 57	60, 66, 69	82, 75	77, 85, 90	100, 107	92, 99, 105
66, 55	56, 57, 63	84, 81	74, 76, 78	102, 105	100, 106, 108
68, 63		86, 85		104, 95	
70, 61		88, 89		106, 99	
72, 59		90, 79		108, 93	

The instructions for the G, I treatments were obvious variants of those used for the I, G treatments listed below. The instructions for the I, G* treatments differed from the I, G instructions in one part, and we reproduce just that part below to avoid needless repetition of identical instructions. Again, copies of all instructions for all treatments are stored at *ExLab*.

A. Individual Characteristics

Numeric ID: _____

Some questions about you

In this survey most of the questions asked about you are descriptive, and your responses are completely confidential. Please think carefully about each question and give your best answers.

1. What is your age? _____ years

2. What is your sex? (Circle one number)

01 Male
02 Female

3. Which of the following categories best describes you? (Circle one number)

01 White
02 Indian
03 African
04 Spanish-Indian
05 Spanish-African
06 Other

4. Where have you lived most of your life? (Circle one number)

01 City of more than 1.000.000 inhabitants
02 City of 100.000 – 1.000.000 inhabitants
03 Town of 20.000 – 99.999 inhabitants
04 Town of 5.000 – 19.999 inhabitants
05 Town of less than 5.000 inhabitants
06 Other

5. What type of residence do you live in?

01 Owner-occupied house
02 Owner-occupied apartment
03 Rented house
04 Rented apartment
05 Multi-ownership of residence, cooperative
06 Rented room
07 Official residence, etc.

6. What is your major? (Circle one number)

01 Business Administration
02 Economics
03 Engineering
04 Law
05 Medicine
06 Sciences (Biology, Physics, Maths, Chemistry)
07 Architecture and Design
08 Social Sciences (Anthropology, Political Science, Philosophy, History, Idioms, Psychology)

09 Arts and Humanities (Music, Literature, Art)
10 Other Fields

7. What is your class standing? (Circle one number)

01 First year
02 Second year
03 Third year
04 Fourth year
05 Fifth year
06 Masters
07 Specialization

8. What is your main source of finance for the tuition fee at the University of Los Andes? (Circle one number)

01 Yourself
02 Your parents
03 Scholarship
04 Loan
05 Other

9. What is your normal means of transportation to the University of Los Andes? (Circle one number)

01 Walking
02 Bicycle
03 Bus
04 Taxi
05 Car
06 Driver

10. Are you currently... (Circle one number)

01 Single?
02 Married?
03 Separated, Divorced or Widowed?

11. How many people live in your household? (Circle one number)
[Include yourself and family members at your residence.]

01 1 person
02 2 people
03 3 people
04 4 people
05 5 people
06 More than 5 people

12. What is your average personal income per month? (Circle one number)
[Consider all forms of income, including salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, child support, and others.]

01 Less than $358.000

02 $358.001 – $1.074.000
03 $1.074.001 – $1.790.000
04 $1.790.001 – $3.580.000
05 $3.580.001 – $5.370.000
06 More than $5.370.000
07 Don't know

13. What is the average income per month earned by people in your household, with "household" defined in question 11? (Circle one number)
[Consider all forms of income, including salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, child support, and others.]

01 Less than $358.000
02 $358.001 – $1.074.000
03 $1.074.001 – $1.790.000
04 $1.790.001 – $3.580.000
05 $3.580.001 – $5.370.000
06 More than $5.370.000
07 Don't know

14. How many hours per week do you work? (Circle one number)

01 Less than 10 hours
02 10 – 20 hours
03 21 – 30 hours
04 31 – 40 hours
05 More than 40 hours

15. What is your hourly wage rate before taxes? _____ pesos

16. Do you currently smoke cigarettes? (Circle one number)

01 No
02 Yes

If yes, how many cigarettes do you smoke per day? _____ cigarettes

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B. Treatment I, G

Experimenter script for D, RA tasks – I, G

Welcome announcement

Thank you for agreeing to participate in this survey. Recall that you will be paid 5 dollars for your participation.

Before we begin, I will come around and distribute an informed consent form and ask each of you to read and sign it verifying that you read it and understand. This form is used for your protection only.

[Distribute informed consent form.]

I will now come around and ask each of you to pick an envelope from me. The envelope contains two cards with ID numbers that we will use to keep track of who answered which questions. A numeric ID is printed on the white card, and a letter ID is printed on the pink card, each to be used in a different part of the experiment. This will be explained to you later. All records and published results will be linked to anonymous ID numbers only, and not to your name. Please keep your ID numbers private and do not share the information with anyone else.

[Each subject picks an envelope containing two ID numbers.]

You will be given written instructions and examples for the tasks today, and I will now come around and distribute the questionnaire and instructions that we will be using. Please make sure your mobile phones are turned off to avoid interruptions during the experiment.

[Give handouts to subjects: questionnaire and instructions.]

I will now ask one person to come up here and inspect the bingo cage that we will use several times during today's session. Please verify that we have here 100 balls numbered from 1 to 100. I will now ask you to place these balls into the bingo cage. Please take your seat again.

WELCOME TO THE EXPERIMENT
THESE ARE YOUR INSTRUCTIONS

This is an experiment in the economics of decision making. Your participation in this experiment is voluntary. However, we think you will find the experiment interesting. You will be paid for your participation *and* you could make a considerable amount of additional money. The instructions are simple and you will benefit from following them carefully. Please take a few minutes to read them through together with me.

In this experiment you may receive some money from us in addition to the guaranteed participation fee. How much you receive will depend partly on chance and partly on the choices you make in the decision problems which will be presented to you in a few minutes.

The problems are not designed to test you. What we want to know is what choices you would make in them. The only right answer is what you really would choose. That is why the problems gives you the chance of winning real money.

The experiment will proceed in four parts.

Part I consists of some questions about yourself. Your answers to these questions will be kept confidential and used for statistical purposes only.

Part II, III and IV are decision problems that require you to make a series of economic choices. These problems are described in more detail later. Each of these problems give you a chance to earn money, and they are each different from each other.

At the end we will ask you to step aside for a moment and then call you back in, one at a time, to pay you in private.

At this time we ask that you answer the questions for Part I in the questionnaire. Please type your numeric ID from the white card in the top left corner on the questionnaire.

Instructions for Part II

We will now continue with Part II of the experiment. You will be asked to make one choice on the record sheet that I will distribute to you in a moment.

In this decision problem you will be paired with one other person in this room. This pairing is done randomly. Neither of you will know the identity of the other person, so your decisions will be anonymous. One of you is then selected to make a choice about how to divide income between the two of you. The other person will make no decision in this task. The selection is done using your numeric ID on the white card. If you have an even numeric ID you will make the decision. If you have an odd numeric ID you will not make a decision.

Please verify whether you have an even or an odd numeric ID on the white card. Please keep your numeric ID private from other participants at all times.

Are there any questions?

The choice to be made is similar to the following, although the amount of money to be divided will be different:

Divide 100 dollars:

Hold **_____ dollars, and** ***Pass*** **_____ dollars.**

In this choice you must divide 100 dollars. You can keep all of the money, keep some and pass some, or pass all of the money.

Important: You can choose any amount of income to hold and to pass, but the sum must be equal to 100 dollars.

Before you begin, we will first decide the allocation of initial income. Only people with an even numeric ID will receive a random initial income. This is the money that the decision concerns. The amount is determined using a 10-sided die, numbered from 1 to 10. The amount in dollars is equal to 15 plus 1 times the number on the die. Thus if the number is 1 the amount is 16 dollar, and if the number is 10 the amount is 25 dollar. I will now come around and ask those of you with an even numeric ID to roll a 10-sided die to determine the initial income.

[DISTRIBUTE RECORD SHEETS AND RECORD INCOME.]

I would like one person to come up here and verify that we have here 9 cards with an odd numeric ID, one card for every person with an odd numeric ID in the room. I will now mix the cards and ask each person with an even numeric ID to pick one card. This determines the match of odd and even numbered people into pairs. We will not reveal the identify of the people who are matched up.

[USE CARDS WITH NUMERIC ID AND RECORD PAIRS.]

Please type the numeric ID of the other person in the top right corner on the record sheet.

[COLLECT CARDS AND CHECK ID ON RECORD SHEETS.]

Each of you will receive the money according to the outcome of this task at the end of the meeting, so other people will not know your decisions.

At this time we ask that you fill out the record sheet for this decision problem. Please type your numeric ID from the white card in the top left corner on the record sheet. Please do not talk.

Numeric ID: _____ Other person: _____

Please fill in the amount below after you have rolled the die to determine your initial income.

Divide _____ dollars:

***Hold* _____ dollars, and *Pass* _____ dollars.**

Amount of money you will receive from us at the end of the experiment for this task (the amount you hold above if you have an even numeric ID or the amount in Pass if you are the Other person):

_____ dollars.

[CHECK SUM AND DISTRIBUTE RECORD SHEETS.]

Instructions for Part III

We will now continue with Part III of the experiment. In this part you will be using the letter ID that you can see on the pink card.

Each person in this room will have a chance to receive an additional large sum of money. If you are selected to receive this sum of money, you will have a choice between two payment options; option A or option B. Each person will have a 1-in-10 chance of receiving the money. The selection will be done using a 10-sided die, which has 10 numbers from 0 up to 9 on it. If the number 0 is drawn you will receive the money at the end of the meeting. If any other number is drawn you will not receive the money.

You will be asked to make a series of choices in one decision problem. The table shown below is an illustration of what the decision problem will look like.

Decision	Option A	Option B	Your Choice (Circle A or B)
1	$2.00 if ball is 1-10 $1.60 if ball is 11-100	$3.85 if ball is 1-10 $0.10 if ball is 11-100	A B
2	$2.00 if ball is 1-20 $1.60 if ball is 21-100	$3.85 if ball is 1-20 $0.10 if ball is 21-100	A B
3	$2.00 if ball is 1-30 $1.60 if ball is 31-100	$3.85 if ball is 1-30 $0.10 if ball is 31-100	A B
4	$2.00 if ball is 1-40 $1.60 if ball is 41-100	$3.85 if ball is 1-40 $0.10 if ball is 41-100	A B
5	$2.00 if ball is 1-50 $1.60 if ball is 51-100	$3.85 if ball is 1-50 $0.10 if ball is 51-100	A B
6	$2.00 if ball is 1-60 $1.60 if ball is 61-100	$3.85 if ball is 1-60 $0.10 if ball is 61-100	A B
7	$2.00 if ball is 1-70 $1.60 if ball is 71-100	$3.85 if ball is 1-70 $0.10 if ball is 71-100	A B
8	$2.00 if ball is 1-80 $1.60 if ball is 81-100	$3.85 if ball is 1-80 $0.10 if ball is 81-100	A B
9	$2.00 if ball is 1-90 $1.60 if ball is 91-100	$3.85 if ball is 1-90 $0.10 if ball is 91-100	A B
10	$2.00 if ball is 1-100	$3.85 if ball is 1-100	A B

The table shows ten decisions listed on the left side, in the column marked **Decision**. Each decision is a paired choice between "Option A" and "Option B." You will be asked to make a choice between these two options in each decision row.

Before you start thinking about your choice, let me explain how your choice affects your earnings. Earnings depend partly on the outcome of a spin of the bingo cage you see in this room. When the bingo cage is spun, a single ball will be randomly picked from all the balls in the bingo cage, and the number on the ball will in part determine your earnings. The bingo cage contains 100 balls which are individually numbered from 1 to 100, so any number between 1 and 100 is equally likely to be chosen.

Please look at decision 1 at the top of the table. Option A pays $2 if the bingo ball is numbered 10 or lower, and it pays $1.60 if the bingo ball is numbered 11 or higher. This means that there is a 10-in-100 chance of getting $2 and a 90-in-100 chance of getting $1.60.

Option B in decision 1 at the top of the table yields $3.85 if the bingo ball is numbered 10 or lower, and it pays $0.10 if the bingo ball is numbered 11 or higher.

The other decisions are similar, except that as you move down the table the chances of the higher payoff for each option increase. In fact, for decision 10 in the bottom row, the bingo cage will

not be needed since each option pays the highest payoff for sure. So your choice in decision 10 is simply between $2 or $3.85.

For each of the ten decisions, you will be asked to choose Option A or Option B by circling the appropriate letter, A or B. The letters are shown on the right of the table. What kind of decision you make is entirely up to you.

As you can see, you have 10 decisions to make. Nevertheless, we will pay you for only one of these decisions. After you have made all of your choices we will use the bingo cage to select which decision will be used to determine your payment. To decide which decision row will determine your payment, we will spin the bingo cage you see in this room and withdraw one ball. The bingo cage contains 100 balls, numbered individually from 1 to 100. The number on the bingo ball determines the decision row you will play out. Thus if the number is between 1 and 10 you will play out decision row 1, if the number is between 11 and 20 you will play out decision 2, and so on. Each decision row is therefore equally likely to be chosen.

Once we know which choice is binding, we will spin the bingo cage to see if you will receive the higher amount or the lower amount for the choice that you made. Thus if you chose Option A, you would be paid the appropriate amount in Option A; if you chose Option B, you would be paid the appropriate amount in Option B.

To illustrate our procedures, we will now continue with an example where the payments are indicated in chocolate kisses. You will be asked to make choices in one problem. After you have completed your choices we will perform all the draws using the bingo cage to determine your payments.

Each person will have a 1-in-10 chance of receiving the chocolate kisses. The selection will be done using a 10-sided die. If the number 0 is drawn you will receive the chocolate immediately. If any other number is drawn you will not receive the chocolate.

At this time we ask that you fill out the record sheet for this example. Please type your letter ID from the pink card in the top left corner on the record sheet.

Letter ID: _____

Decision	Option A	Option B	Your Choice (Circle A or B)
1	6 kisses if ball is 1-10 4 kisses if ball is 11-100	10 kisses if ball is 1-10 1 kiss if ball is 11-100	A B
2	6 kisses if ball is 1-20 4 kisses if ball is 21-100	10 kisses if ball is 1-20 1 kiss if ball is 21-100	A B
3	6 kisses if ball is 1-30 4 kisses if ball is 31-100	10 kisses if ball is 1-30 1 kiss if ball is 31-100	A B
4	6 kisses if ball is 1-40 4 kisses if ball is 41-100	10 kisses if ball is 1-40 1 kiss if ball is 41-100	A B
5	6 kisses if ball is 1-50 4 kisses if ball is 51-100	10 kisses if ball is 1-50 1 kiss if ball is 51-100	A B
6	6 kisses if ball is 1-60 4 kisses if ball is 61-100	10 kisses if ball is 1-60 1 kiss if ball is 61-100	A B
7	6 kisses if ball is 1-70 4 kisses if ball is 71-100	10 kisses if ball is 1-70 1 kiss if ball is 71-100	A B
8	6 kisses if ball is 1-80 4 kisses if ball is 81-100	10 kisses if ball is 1-80 1 kiss if ball is 81-100	A B
9	6 kisses if ball is 1-90 4 kisses if ball is 91-100	10 kisses if ball is 1-90 1 kiss if ball is 91-100	A B
10	6 kisses if ball is 1-100	10 kisses if ball is 1-100	A B

DECISION ROW CHOSEN BY BALL NUMBER: _____

PAYMENT DECIDED BY BALL NUMBER: _____

EARNINGS: _____

10 SIDED DIE ROLL: _____
(0 means you will be paid this amount for this task)

EXPERIMENTER SCRIPT

[EXPERIMENTER RECORD SHEET AND BLACKBOARD.]

We will first spin the bingo cage to determine which decision row is the binding one for payment.

[SPIN BINGO CAGE.]

We will then spin the bingo cage to determine whether you will receive the higher amount or the lower amount.

[SPIN BINGO CAGE.]

Finally, we will now come around and roll the 10-sided die to determine who will receive the chocolate kisses. If the number 0 is drawn you will receive the chocolate immediately. If any other number is drawn you will not receive the chocolate.

[ROLL 10-SIDED DIE FOR EACH PERSON AND CHECK ID.]

We will now proceed with Part III of the experiment. You will be asked to make choices in one decision problem on the record sheet that I will distribute to you in a moment.

After you have completed the problem, we will perform the random draws using the bingo cage to determine your payments for this part.

Each person will have a 1-in-10 chance of receiving the money. The selection will be done using a 10-sided die. If the number 0 is drawn you will receive the money at the end of the meeting. If any other number is drawn you will not receive the money.

All payments are made in private so other people will not know your decisions.

[DISTRIBUTE RECORD SHEETS TO SUBJECTS.]

At this time we ask that you fill out the record sheet for this decision problem. Please type your letter ID from the pink card in the top left corner on the record sheet.

Letter ID: _____ I

Decision	Option A	Option B	Your Choice (Circle A or B)
1	$50.00 if ball is 1-10 $40.00 if ball is 11-100	$96.25 if ball is 1-10 $2.50 if ball is 11-100	A B
2	$50.00 if ball is 1-20 $40.00 if ball is 21-100	$96.25 if ball is 1-20 $2.50 if ball is 21-100	A B
3	$50.00 if ball is 1-30 $40.00 if ball is 31-100	$96.25 if ball is 1-30 $2.50 if ball is 31-100	A B
4	$50.00 if ball is 1-40 $40.00 if ball is 41-100	$96.25 if ball is 1-40 $2.50 if ball is 41-100	A B
5	$50.00 if ball is 1-50 $40.00 if ball is 51-100	$96.25 if ball is 1-50 $2.50 if ball is 51-100	A B
6	$50.00 if ball is 1-60 $40.00 if ball is 61-100	$96.25 if ball is 1-60 $2.50 if ball is 61-100	A B
7	$50.00 if ball is 1-70 $40.00 if ball is 71-100	$96.25 if ball is 1-70 $2.50 if ball is 71-100	A B
8	$50.00 if ball is 1-80 $40.00 if ball is 81-100	$96.25 if ball is 1-80 $2.50 if ball is 81-100	A B
9	$50.00 if ball is 1-90 $40.00 if ball is 91-100	$96.25 if ball is 1-90 $2.50 if ball is 91-100	A B
10	$50.00 if ball is 1-100	$96.25 if ball is 1-100	A B

DECISION ROW CHOSEN BY BALL NUMBER: _____

PAYMENT DECIDED BY BALL NUMBER: _____

EARNINGS: _____

10 SIDED DIE ROLL: _____
(0 means you will be paid this amount for this task)

EXPERIMENTER SCRIPT

[EXPERIMENTER RECORD SHEET AND BLACKBOARD.]

We will first spin the bingo cage to determine which decision row is the binding one for payment.

[SPIN BINGO CAGE.]

We will then spin the bingo cage to determine whether you will receive the higher amount or the lower amount.

[SPIN CAGE WITH 100 BALLS.]

Finally, we will now come around and roll the 10-sided die to determine who will receive the money. If the number 0 is drawn you will receive the money at the end of the meeting. If any other number is drawn you will not receive the money.

[ROLL 10-SIDED DIE FOR EACH PERSON AND CHECK ID.]

Instructions for Part IV

We will now continue with Part IV of the experiment. You will be asked to make choices in one decision problem on the record sheet that I will distribute to you in a moment. In this part you will again use the letter ID on your pink card.

You will be asked to make a series of choices in a decision problem that is similar to the previous problem. For each of the ten decisions you will again be asked to choose Option A or Option B by circling the appropriate letter, A or B. This time, however, your earnings will depend on your own choice between A and B and the choice by two other people in this room. Each group consists of three randomly selected individuals, and you will not know the identity of the two other people in your group. The choice between A and B in each row is determined by majority in the group.

Therefore, if two people in your group choose A and one person chooses B for a given row, A will be implemented for all three of you. If, on the other hand, two choose B and one chooses A, then B will be implemented.

Before you begin, we will first decide the composition of each group. I would like one person to come up here and verify that we have here 18 cards with a letter ID, one card for each person in the room. I will now mix the cards and ask you to pick three cards for group 1, three cards for group 2, and so on. We will not reveal the identity of the people in each group.

[USE CARDS WITH LETTER ID AND RECORD GROUPS.]

After you have completed the problem, we will collect the two copies of your record sheet from this decision problem and distribute them to the other two members in the group such that all three members in the group will have a copy of all three record sheets. You will then be able to verify the group decision when we select the row and play out the lottery using the bingo cage.

Each person will have a 1-in-10 chance of receiving the money. The selection will be done using a 10-sided die. If the number 0 is drawn you will receive the money at the end of the meeting.

If any other number is drawn you will not receive the money. This draw is done independently for each person, and your chances of winning are not influenced by payments to other members in the group, and vice versa.

All payments are made in private so other people will not know your decisions.

To summarize, the procedures are as follows:

1. All three people in a group will independently fill in their decisions.
2. All three people will receive a copy of all three record sheets.
3. We will spin the bingo cage to select the row for payment.
4. For the selected row we will play out either lottery A or B depending on what the majority of the three of you choose.
5. After playing out the lottery, each of you will roll the 10-sided die individually to determine whether you get paid. Thus, even though the three of you are all playing the same lottery, some of you may get paid and others will not, depending on the individual die rolls.

[DISTRIBUTE RECORD SHEETS TO SUBJECTS.]

At this time we ask that you fill out the record sheet for this decision problem. Please type your letter ID from the pink card in the top left corner on the record sheet.

Letter ID: _____ G

Decision	Option A	Option B	Your Choice (Circle A or B)
1	$50.00 if ball is 1-10 $40.00 if ball is 11-100	$96.25 if ball is 1-10 $2.50 if ball is 11-100	A B
2	$50.00 if ball is 1-20 $40.00 if ball is 21-100	$96.25 if ball is 1-20 $2.50 if ball is 21-100	A B
3	$50.00 if ball is 1-30 $40.00 if ball is 31-100	$96.25 if ball is 1-30 $2.50 if ball is 31-100	A B
4	$50.00 if ball is 1-40 $40.00 if ball is 41-100	$96.25 if ball is 1-40 $2.50 if ball is 41-100	A B
5	$50.00 if ball is 1-50 $40.00 if ball is 51-100	$96.25 if ball is 1-50 $2.50 if ball is 51-100	A B
6	$50.00 if ball is 1-60 $40.00 if ball is 61-100	$96.25 if ball is 1-60 $2.50 if ball is 61-100	A B
7	$50.00 if ball is 1-70 $40.00 if ball is 71-100	$96.25 if ball is 1-70 $2.50 if ball is 71-100	A B
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9	$50.00 if ball is 1-90 $40.00 if ball is 91-100	$96.25 if ball is 1-90 $2.50 if ball is 91-100	A B
10	$50.00 if ball is 1-100	$96.25 if ball is 1-100	A B

OTHER PEOPLE IN GROUP: ____ AND ____
DECISION ROW CHOSEN BY BALL NUMBER: _____

PAYMENT DECIDED BY BALL NUMBER: _____
MAJORITY CHOSE OPTION A OR OPTION B (CIRCLE ONE)

EARNINGS: _____

10 SIDED DIE ROLL: _____
(0 means you will be paid this amount for this task)

EXPERIMENTER SCRIPT

[EXPERIMENTER RECORD SHEET AND BLACKBOARD.]

We will first collect the two copies of your record sheet from this decision problem and distribute them to the other two people in the group so you can confirm payments made to you.

[DISTRIBUTE TWO COPIES OF EACH RECORD SHEET.]

We will now spin the bingo cage to determine which decision row is the binding one for payment.

[SPIN BINGO CAGE.]

We will then spin the bingo cage to determine whether you will receive the higher amount or the lower amount.

[SPIN CAGE WITH 100 BALLS.]

Finally, we will now come around and roll the 10-sided die to determine who will receive the money. If the number 0 is drawn you will receive the money at the end of the meeting. If any other number is drawn you will not receive the money.

[ROLL 10-SIDED DIE FOR EACH PERSON AND CHECK ID.]

Thank you for participating in the experiment. I will ask you to step aside for a moment and then call you back in, one at a time, to pay you in private. Please bring your ID numbers, questionnaire and record sheets with you. Thank you.

[COLLECT QUESTIONNAIRES AND WHITE RECORD SHEETS.]

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*C. Treatment I, G**

Before you begin, we will first decide the composition of each group. I would like one person to come up here and verify that we have here 18 cards with a letter ID, one card for each person in the room. I will now mix the cards and ask you to pick three cards for group 1, three cards for group 2, and so on. We will not reveal the identity of the people in each group.

[USE CARDS WITH LETTER ID AND RECORD GROUPS.]

We will now collect the two copies of your record sheet from the previous decision problem and distribute them to the other two members in the group such that all three members in your group will have a copy of all three record sheets. You will then be able to see what decisions other members of your group made in the previous decision problem. Only ID numbers will be on any record sheet, so you will not know who actually made the other decisions in the group.

[DISTRIBUTE TWO COPIES OF EACH RECORD SHEET]
