Giving To Ingrates?*

Michael Jones, Bridgewater State College

and

Michael McKee, Appalachian State University and University of Calgary

February 2008

Michael Jones, Department of Economics, Bridgewater State College, Bridgewater, MA 02325; e-mail: m3jones@bridgew.edu; FAX (508) 531-4240; phone: (508) 531-2240.

Michael McKee, Department of Economics, Walker College of Business, Appalachian State University, Boone, NC 28608; e-mail: mckeemj@appstate.edu; phone: (828) 262-6080;

* We thank David Bruner for his assistance in running these experiments and the University of Calgary Behavioural and Experimental Economics Laboratory for providing the facilities to conduct the experiments. Funding for this project was provided by the Social Sciences and Humanities Research Council (Canada) via a grant to McKee.

ABSTRACT

Models for voluntary provision of public goods predict free riding is rational unless the model includes a motive for the act of giving referred to as a “warm glow” in the literature. The source for this warm glow is likely to include the gratitude of the recipient. The experimental setting employed here controls for positive or negative reciprocity from the recipient of a gift to isolate the individual satisfaction from the act of giving as the remaining motivation for giving. The experimental treatment is whether the recipient is informed that his/her payoff includes a “gift” from another participant (donor or giver). The central finding is that donations increase when the donor/giver knows that the recipient knows that a gift has been provided.

I. Introduction

Each year charitable organizations raise substantial sums of money through voluntary contributions from millions of individuals. Such donations appear to violate some basic economic axioms, such as selfish preferences, and this behavior is often viewed as irrational. However, widespread irrationality requires explanation and several arguments have been advanced including reciprocity, building reputation to enhance future interactions with others, and/or legacy building.[1] These have the property that the donor be identifiable and that the gift and its size be publicly announced. While such motivations can explain some substantial exhibits of philanthropy, we observe many instances of anonymous or unidentified donations.[2] Of the reasons often cited to explain voluntary giving to others only two, inequality aversion and "warm glow" do not require that the donor be identified in order to motivate donation activity.

Individuals subject to inequality aversion (Englemann and Strobel, 2004) feel uncomfortable having a large amount of money while others do not. Such interdependent utility would explain donations directed toward lower income individuals and also help us understand some of the results reported from laboratory experiments involving the dictator game. On the other hand, it may be that the act of giving yields a direct input to an individual's utility through a "warm glow" from the act of giving (Andreoni, 1990), and the gratitude of the recipient (Amegashie, 2006). Warm glow is the closest to the traditional dictionary definition of altruism, the unselfish concern for others.[3]

---

[1] See Harrison and Johnson (2004) for a discussion of explanations for donation.
[2] Beyond the argument that the donor wishes to remain anonymous to avoid future requests for donations.
[3] Some reasons given to explain positive contributions to a public good are: framing effects, confusion, reciprocity, and a warm glow (benefits received from the act of giving). All these reasons, with the exception of warm glow, can be considered mistakes by the individual or measurement errors by the experimenters. Warm glow is an actual motivation to contribute that works against the tendency to free ride. As Ozinga (1999) states, "Altruism is behavior benefiting someone else at some cost to oneself, while selfishness is behavior that benefits oneself at some cost to others."

Laboratory experiments provide a controlled setting in which to investigate motives for giving to others. The laboratory allows the experimenter to control information received by the participants and to manipulate payoffs by virtue of the induced value method (Smith, 1975). Since there are multiple potential motives for giving, it is important to be able to isolate these through the design of the experimental interface. To investigate altruistic behavior many economists have adapted the "dictator game" (Forsythe et. al., 1994) in which one individual is assigned the role of the dictator (giver or donor) and another individual the role of the peasant (recipient). The giver is provided an endowment and may choose the quantity to pass to the recipient. In the traditional dictator game, the dictator is free to choose the quantity of the endowment to transfer and the peasant is informed of the size of the pot of money to be allocated by the dictator. When this setting is applied to the investigation of altruism, the experimental design is modified to reflect the purpose. The giver must decide whether to transfer a predetermined amount of the endowment to the recipient or to keep all of the endowment but the recipient is typically informed of the gift. With these preset transfers, the parameters can be manipulated to allow for the investigation of the willingness to give and the resulting data may be used to quantify altruism (Andreoni and Miller, 2002). Since there is a range of possible motivations supporting altruistic behavior, a question arises as to what each of these effects contributes to the overall level of altruism observed. This question may be especially important to our understanding of successful fundraising activities.

In our experiments, we control (as a treatment) the information presented to the recipient regarding the source of his/her income for the round of the experiment. In one setting, the recipient is informed that a sum of money has been transferred to him/her by the donor (the donor has given up some income); in the alternate setting the recipient is not so informed. This latter setting removes the possibility of recipient gratitude as an argument in the donor's utility.

The recipient can only infer that the other player has simply chosen the strategy that makes him/her the most money. To the extent that it is possible to manipulate the effects of recipient gratitude and/or to provide information of the income levels of recipients if we find that these factors affect giving then we may wish to design fundraising activities with these factors in mind.

One interpretation of a "warm glow" motivation is that it is the act of giving itself that provides utility and this reward is independent of other motivations such as the gratitude of the recipient. By design, our experimental interface allows us to isolate the effects of "warm glow" by effectively eliminating or introducing any possible gratitude effect. By careful implementation we also control for other possible effects such as reciprocity and confusion. Since "warm glow" is a rational behavior, we expect it to obey the axioms of consumer behavior and so we test for rational responses to price changes in the cost of giving. We find that the level of giving is higher when gratitude is available, the giving decreases as the price increases, and that inequality aversion is not present in our setting.

II. Utility with Warm Glow and with Gratitude

The basic model of individual optimizing behavior can be extended to include the act of donating to others. Amegashie (2006) introduces gratitude into individual preferences through incorporating the utility of the recipient into the utility function of the donor. Begin with the simple setting in which the recipient's utility is a function of the transfer, t, only. Thus $U_R = U_R(t)$. Now, if the individual feels gratitude from the fact that the transfer has been made (over and above the utility from the money itself) Amegashie introduces a gratitude function $g = g(t/m)$ where m is the wealth of the donor. Thus g is increasing in the relative size of the transfer. For g to enter the utility of the recipient, it must be that R knows he has received a gift and, since m matters, who the gift has come from. Given this knowledge, $U_R = U_R(t, g(t/m)$. If the donor

knows that the recipient is aware the money received is a gift from the donor, then $U_D = U_D(c, U_R(t,g))$. In the absence of such knowledge, the donor's utility is given by $U_D = U_D(c, U_R(t))$. If g is a good, the utility the donor obtains from an anonymous gift must be lower than from a gift that can be identified as coming from the donor. Further, if it is not possible for the recipient to know that a gift has been given and the donor is aware of this, the only motivation remaining for the donor to transfer money to the recipient must be pure "warm glow" deriving from the satisfaction of having given to one less fortunate.[4]

Andreoni and Miller (2002) "find that it is indeed possible to capture altruistic choices with quasi-concave utility functions for individuals—altruism is rational." They go on to conclude their results apply to more than simple dictator games and that many other things other than the final allocation of money matter to the subjects. Their findings suggest 43% of the subjects have a standard utility function, 28.5% have the Leontief utility functions (perfect complements), and 28.5% have linier utility functions (perfect substitutes).

Andreoni (1995a) notes that framing effects may partially explain altruistic behavior, especially that observed in the lab. "It must be that people enjoy doing a good deed more than they enjoy not doing a bad deed." Our design reduces framing effects by labeling the decisions generically "A" and "B" instead of "Give" (positive framing) or "Keep" (negative framing). Confusion on the part of the subjects may appear to be altruistic behavior, particularly if errors are bounded by the selfish prediction. Andreoni (1995b) examines the hypothesis that contributions may be due to confusion by the subjects rather than kindness or cooperation. The

[4] In Palfrey and Prisbrey (1997), altruism and warm-glow are described, "By altruistic preferences we mean that a subject's utility is increasing, not only in his or her own payoff, but also in the total group payoff. Warm-glow preferences mean that the *act* of contributing, independent of how much it increases group payoffs, increases a subject's utility by a fixed amount" [italics in original]. Palfrey and Prisbrey (1997) point out the two effects are different in their relationship to group size and the value of the public good. Unlike altruism, "the warm-glow explanation does not depend on group size or the marginal value of the public good." Therefore, preferences this research is seeking to measure is warm glow giving.

explicit communication of payoffs, detailed instructions, and simple configuration of the experiment design are intended to minimize confusion in this experiment.

Another confounding effect is that of reciprocity where subjects tend to "respond to perceived kindness with kindness and perceived meanness with meanness and to expect this behavior from others" (Sobel, 2005). It is important to include the consumption of others in the utility function of an individual, especially when they are giving to a charity. However, both positive and negative reciprocity must be controlled for in an experiment trying to measure "the act of giving." A final confounding effect is the inequality aversion motivation discussed above. Since our design offers a range of final allocations between the giver and the receiver, we will be able to evaluate the effect of inequality aversion as a contributing factor in giving.

III. Experimental Design, Parameters, and Hypotheses

The experiment interface is designed to allow us to isolate the warm glow and gratitude motivations for giving to another individual. We adapt the basic dictator game to achieve our design objective. The modifications involve controlling the information provided to the giver (dictator) and the recipient (peasant) and adjusting the relative price of giving. There are two key elements of the experimental design. First, from the theoretical development presented above, identification of the contribution of warm glow and gratitude to altruism requires that we control the information presented to the giver. The resulting information treatments are summarized in Table 1. In T1 the recipient knows that a gift has been transferred. That is, the payoff table reveals that the payoff received is due to the giver transferring a portion of the giver's potential payoff to the recipient. In T2 the recipient does not know that a gift has been transferred. That is, in this treatment the recipient knows only own payoff and has no means of

knowing that the giver would have had a higher payoff if the gift had not been transferred. Most importantly, the donor is completely informed of what the recipient knows in either treatment.

Table 1 – Experiment Design

Treatment	Donor Information Condition	Recipient Information Condition
T1	Knows Recipient Knows of Gift	Knows of Gift
T2	Knows Recipient Does Not Know of Gift	Does Not Know of Gift

The second element of the design is the parameter space that allows us to measure the propensity to give across a range of relative costs of transferring a given amount of the payoff. Here we borrow somewhat from Andreoni and Miller (2002) in terms of our structure but we alter their actual parameters to reflect the fact that we are able to collect more data in a session since our experiment is computerized but that we must impose a binary choice on the giver: give $x or give 0.

As noted, this experiment is computer based. In order to minimize the effects of experimenter bias the program is designed to be the only interaction with the subject through the entire session. As such the subjects each take a seat at a computer and once the proctor tells them to start the subjects follow the instructions presented to them on the screen and make a series of decisions until the session is complete. The instructions are shown on the screen in simple, easy to follow language. Simplicity is a key factor in controlling for confusion, one of the previous explanations for apparent warm glow giving. When the session has moved into the decision making part of the session, there are buttons on the screen where the subject can click to review components of the instructions.

In the experiment all values are expressed in lab dollars. The exchange rate is announced at the beginning and the same exchange rate applies to the subjects assigned the role of giver and

those assigned the role of recipient. In this way, the subjects know that the experimenter will not make up for differences in final payoffs arising from role assignment. All payoffs earned in the experiment are the result of decisions made by the participants in the experiment.

There are three decision screens (Figures 1 and 2 below), two of which are used to construct a treatment. For the treatment in which the recipient is aware that a gift has been transferred (T1) the decision screens are shown in Figures 1a and 1b. Figure 1a is the screen presented to subject assigned the role of potential "giver" (dictator) whose decisions determine both subjects' payoffs. Figure 1b shows the screen seen by the recipient. The giver is shown the complete matrix and is informed that the recipient also sees both players' payoffs. Thus the recipient in this setting is informed he/she has received a gift at a cost to the giver. For the no information treatment (T2) the subjects are presented figures 2a and 2b respectively. Here the recipient is shown only their own payoff and is unaware of the generosity (or lack thereof) of the giver and the giver is fully away of this (figure 2a). In addition, as the subjects are informed, the pairings are randomly assigned each round and are completely anonymous. The full effect of this design is that the giver knows only that a randomly assigned individual (who may have been treated well or not in previous rounds) may be made better off through his or her decision but that this recipient will never know that this payoff was the result of an act of generosity or was simply the effect of the other player choosing his or her maximum payoff. Thus, there is no avenue for gratitude to affect the payoff to the giver.

To control for framing effects the choices are simply labeled as "A" or "B" on the buttons. The language throughout the experiment is similarly context free. To reduce confusion on the part of the subjects, the experiment session begins with several rounds of "training" where the subjects go through all steps without affecting their earnings.

Each round the subjects choose either A or B and then submit. Once all the subjects have entered their choice and submitted, the entries are recorded in the database and the subject pages reappear with the joint choices revealed and the payoffs presented. With 20 rounds in a session, subjects will be paired with the same person more than once during a session, but there is no means for the subjects to recognize their "partner" and the pairings are always randomly assigned. Subjects maintain the same role (giver or receiver) throughout the entire session.

Table 2 – Experiment Parameters for Giver

Round	**Keep**	**Transfer**	**Multiplier**	**Gain to Receiver**	**Gift Price per "$" of Gift**
1	91	9	1.26	11	0.79
2	58	42	1.26	53	0.79
3	91	9	0.51	5	1.96
4	81	19	1.26	24	1.26
5	58	42	0.51	21	1.96
6	91	9	1.40	13	0.71
7	72	28	0.51	14	1.96
8	58	42	0.64	27	1.56
9	72	28	0.64	18	1.56
10	63	37	1.26	47	0.79
11	91	9	0.64	6	1.56
12	72	28	1.40	39	0.71
13	63	37	0.51	19	1.96
14	58	42	1.40	59	0.71
15	81	19	0.51	10	1.96
16	63	37	0.64	24	1.56
17	81	19	0.64	12	1.56
18	72	28	1.26	35	0.79
19	81	19	1.40	27	0.71
20	63	37	1.40	52	0.71
TOTAL	1460	540			

The experiment parameters are presented in Table 2. Each of our rounds constitutes a budget in the Andreoni and Miller (2002) terminology. Since our design differs in that the givers are offered a choice of two strategies, our parameters are selected to yield choice spaces that are similar to Andreoni and Miller in the sense of allowing investigations of revealed preference

behavior. Thus, we have set the parameters such that we have multiple observations at a given transfer price and multiple observations at each given "keep" level. This structure will allow us to test for relative price effects, for the effect of the transfer on inequality, and for difference due to the total payoff to the pair. There are six rounds (2, 10, 12, 14, 18, and 20) in which the transfer would result in a payoff to the recipient of 35 or higher – i.e., substantially reduce inequality. The possible final outcomes (pairs of payoffs), conditional on the transfer being made, range from a high of (58, 59) to a low of (91, 5). From this design we can define a measure of equity to capture the effect of the transfer: Equality = Receiver Payoff/Giver Payoff.

IV. Experiment Hypotheses and Results

We have conducted four sessions with 39 subjects assigned the role of givers (20 in Treatment 1 and 19 in Treatment 2).[5] The givers make 20 decisions facing the parameters shown in Table 2. The payoffs are shown to both the receiver and giver after each round. The pairs are reassigned each round, as noted above, but the subjects maintain their role throughout the experimental session. The results for various metrics are presented in Table 3. There is clearly an empirically large difference in the behavior of the subjects assigned the role of "Giver" across our treatments. The number of occurrences of the gift is much larger in Treatment 1 (the gratitude treatment) as is the total amount given. Interestingly, the average amount given is similar. Our results suggest that, absent gratitude as a possible motivation, the giver is less likely to transfer some of the endowment to the recipient player.

Summary statistics are reported in Table 4. The dataset constitutes a panel with 39 subjects each making a series of 20 decisions under different transfer or gift costs and different

[5] Our design called for 20 subjects in each session. Thus, there were to be 10 givers and 10 receivers in each session (total of 20 per treatment). Due to a higher than average no show rate, one of our sessions was conducted with 18 subjects or 9 givers.

prices pre dollar of the gift received. Since our design restricts the giver's decision to a binary choice, give a preset transfer or not, the dependent variable is binary. All estimations reported here utilize linear probability models and these results are reported in Table 5. The models are estimated with robust standard errors and controls for clustering by individual subjects.

Table 3 – Simple Descriptive Statistics of Behavior

Metric	**Treatment 1**	**Treatment 2**
Number of Gifts (maximum possible)	173 (400) 43.25%	101 (380) 26.57%
Total Amount Given (Lab $)	4523	2601
Average Size of Gift (Lab $)	26.145	25.752

Table 4: Summary Statistics (Number of observations = 780, Number of subjects = 39)

Variable	**Definition**	**Mean**	**Standard Deviation**
Gift	Dummy variable; = 1 if gift transferred	0.3513	0.478
Gift Price	Price of giving $1 (lab)	1.2785	0.515
Age	Age of subject in years	21.54	4.194
Gender	Dummy variable; = 1 if male	0.36	0.480
Gratitude Signal	Dummy variable; = 0 if gratitude signal provided	0.48	0.5001
SumPay	Total payoff to both giver and receiver	100.26	6.300
Equality Index	Receiver's Payoff/Giver Payoff	0.3885	0.2813

The econometric results, reported in Table 5, show the propensity to give is decreasing in the price of the gift. Gender and age have no effect for our subject pool. The key variable for our argument is our information treatment as this is the mechanism by which we introduce the possibility of gratitude affecting the propensity to give. Giving is negatively correlated with the absence of the gratitude factor. This is consistent with the argument made in the theory section above and also with the descriptive statistics reported in Table 3. While there is a "warm glow" effect it is clear that it is augmented when the donor is aware that the recipient learns of the gift and may feel some gratitude toward the donor. These results may explain the existence of

anonymous donors but it also explains the propensity for charitable organizations to tie the gift to an expression of gratitude by "personalizing" the recipient. Since giving behavior may be conditional on unobserved personal characteristics we introduce LAG GIFT as a control in all models. The sign on the coefficient of this variable, which captures innate tendency to give, is positive as expected. That is the probability of giving in the current round is positively correlated with having given in the previous round. Since the structure of the possible gifts over the rounds follows no discernable pattern (Table 2) and the coefficient on the Round variable is not significant (Table 5, model 2) we argue that the inclusion of the lagged term is capturing innate individual characteristics.

As noted, our design controls for the obvious confounding factors such as framing. More importantly it also controls for an expectation that the experimenter will "make up" for the low payoff of the recipient through exchange rate adjustments and the constant assignment of roles (giver versus recipient) throughout the session to ensure that there is no reciprocity motive. Our design, of necessity to create the variations in prices of giving, results in different levels of total payoffs (giver plus recipient) as is evident in Table 2. To test whether the subjects assigned the role of "giver" are attempting to maximize the amount of money the experimenter must pay out, we have included the sum of the payouts as an explanatory variable (model 3, Table 5). A positive coefficient would indicate a higher propensity to give when the total payout (sum of giver and receiver payoffs) was higher. The coefficient on this variable is not significant in this or any specification that we have tried. From these tests it appears that our design controls for extraneous factors that may affect the propensity to record a gift.

The simplest specification (Model 4) includes only the treatment and experimental control variables. Without the remaining control covariates the overall goodness of fit is rather poor. However, the results for this parsimonious specification do provide further support for our

central hypothesis that giving is enhanced when the recipient is informed of the gift and that the donor has foregone income. In this, as in all specifications run, inequality aversion appears to provide little motivation for giving. The coefficient on our Equality Index variable is systematically negative and significant implying that the propensity to give is actually *lower* when inequality would be reduced.

Table 5: Gift Giving – Dependant Variable is Give (0 or 1)

Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Constant	0.708*** (0.214)	0.690*** (0.222)	0.653* (0.376)	0.399 (0.307)
Gift Price	-0.162*** (0.055)	-0.158*** (0.055)	-0.159*** (0.049)	-0.112*** (0.039)
Lag Gift	0.241*** (0.072)	0.240*** (0.072)	0.241*** (0.073)	
No Gratitude Signal Provided	-0.128** (0.064)	-0.127** (0.064)	-0.128** (0.064)	-0.168** (0.084)
Equality Index	-0.207** (0.092)	-0.205** (0.092)	-0.208** (0.094)	-0.149** (0.074)
Age	-0.003 (0.006)	-0.003 (0.006)	-0.003 (0.006)	
Gender	-0.032 (0.073)	-0.032 (0.073)	-0.032 (0.073)	
Round		0.001 (0.222)		
Sum Payoff			0.0005 (0.003)	0.002 (0.003)
Wald Test	151.03***	157.63***	188.97***	101.23***
R-squared	0.110	0.110	0.110	0.043

Note: all models estimated using linear probability random effects estimation with robust standard errors and corrected for clustering. Number of observations is 741 and number of panels is 39.

V. Conclusions and Discussion

We have argued that our experimental design is perhaps the only one to date that has truly isolated the effects of pure altruism or "warm glow" giving. Givers cannot expect

reciprocity; the role assignment is unchanged throughout the experiment session and subjects are informed they will participate in only one session. Nor can the giver expect gratitude in the "non-gratitude" treatment since the recipient does not know that he/she has received a gift in this "warm glow" treatment. Further, the instructions clearly state that the exchange rate is the same for all participants; the donors can not assume that the experimenter will offset the uneven earnings via an ex post settling. In the "warm glow" treatment the giver must be motivated only by the intrinsic motive of giving while in the "gratitude" treatment there are two sources of motivation for giving and our design allows us to disaggregate motives for giving. We vary the price per dollar of giving and the opportunity cost of making a gift, so our data permit further investigation of the rationality of the giving decision as per Andreoni and Miller (2002).

While our setting does not appear to generate observed behavior consistent with inequality aversion, that is not to say that such motivations do not exist. Our framework is not explicitly designed to test for such behavior and our investigation of it is only intended to complement our primary objective – investigating the effects of gratitude on giving behavior.

Our results suggest that there are separable motives for giving. Warm glow is the only motivation available to the donors in Treatment 2; we observe giving. In aggregate, the donors transfer 2,601 lab dollars of a possible 21,060 lab dollars (12.35%) to the recipients. Introducing the possibility of the recipient feeling gratitude we observe a higher propensity to give; suggesting that motives for given are additive. In the "gratitude" treatment the donors transfer 4,523 lab dollars of a possible 21,600 lab dollars (20.94%). That is the donors were somewhat less than twice as likely to make a transfer when the donors perceive gratitude may result from the gift. Should this result generalize, it suggests that fundraisers may be able to exploit the additive aspect by tying gifts to specific recipients and, demonstrably, informing the recipients of the gift and its source. This seems a worthy topic for some future attention.

References

Amegashie, J. Atsu, (2006), "Economics, Gratitude, and Warm Glow," working paper, Department of Economics, University of Guelph, Guelph, ON, Canada.

Andreoni, James (1989), "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence," *The Journal of Political Economy*, Vol. 97, No. 6 (December), pp 1447-1458.

_____ (1990), "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving," *The Economic Journal*, Vol. 100, No. 401 (June), pp 464-477.

_____ (1995a), "Warm-Glow Versus Cold-Prickle: The Effects of Positive and Negative Framing on Cooperation in Experiments," *The Quarterly Journal of Economics*, Vol. 110, No. 1 (February), pp 1-21.

_____ (1995b), "Cooperation in Public Gods Experiments: Kindness or Confusion?" *The American Economic Review*, Vol. 85, No. 4 (September), pp 891-904.

Andreoni, James and Miller, John (2002) "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism," *Econometrica*, Vol. 70, No. 2 (March), pp 737-753.

Andreoni, James and Miller, John H. (1993) "Rational Cooperation in the Finitely Repeated Prisoner's Dilemma: Experimental Evidence," *The Economic Journal*, Vol. 103, No. 418 (May), pp 570-585.

Becker, Gary S. (1972) "A Theory of Social Interactions," *The Journal of Political Economy*, Vol. 82, No. 6 (November-December), pp 1063-1093.

Burnham, T.C. (2003) "Engineering Altruism: A Theoretical and Experimental Investigation of Anonymity and Gift Giving," *Journal of Economic Behavior and Organization*, 50: 133-144.

Englemann, D. and Strobel, M., (2004) "Inequality Aversion, Efficiency, and Maximin Preferences in Simple Distribution Experiments," *The American Economic Review*, 94: 857-869.

Forsyth, R., Horowitz, J.L., Savin, N.E., and Sefton, M., (1994) "Fairness in Simple Bargaining Games," *Games and Economic Behavior*, 6: 347-369.

Harrison, Glenn W. and Johnson, Laurie T. (2004) "Identifying Altruism in the Laboratory," (working paper).

Ledyard, John O. (1995), "Public Goods: A Survey of Experimental Research," in *The Handbook of Experimental Economics*, Kagel, John H. and Roth, Alvin E., eds., Princeton: Princeton University Press, 1995, pp 111-194.

Ozinga, James R. (1999), *Altruism*, Westport, CT: Praeger, 1999.

Palfrey, Thomas R. and Prisbrey, Jeffrey E. (1997), "Anomalous Behavior in Public Goods Experiments: How Much and Why?" *The American Economic Review*, Vol. 87, No. 5 (December), pp 829-846.

Sobel, Joel (2005) "Interdependent Preferences and Reciprocity," *Journal of Economic Literature*, Vol. XLIII (June), pp 392-436.

Figure 1a - Sample Subject Screen of Giver (T1)

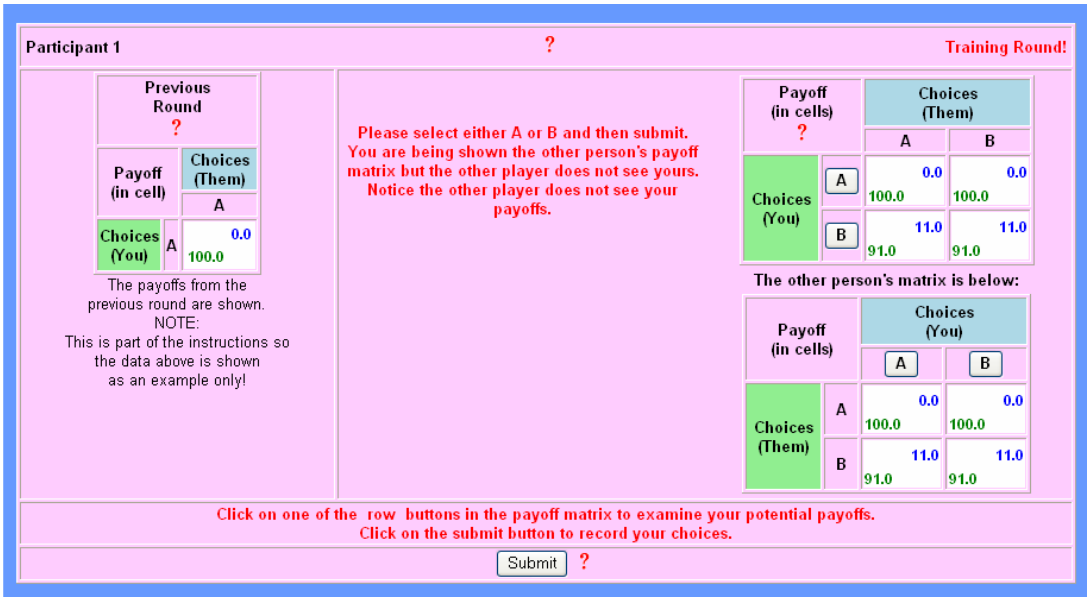

Figure 1b - Sample Subject Screen of Receiver (T1)

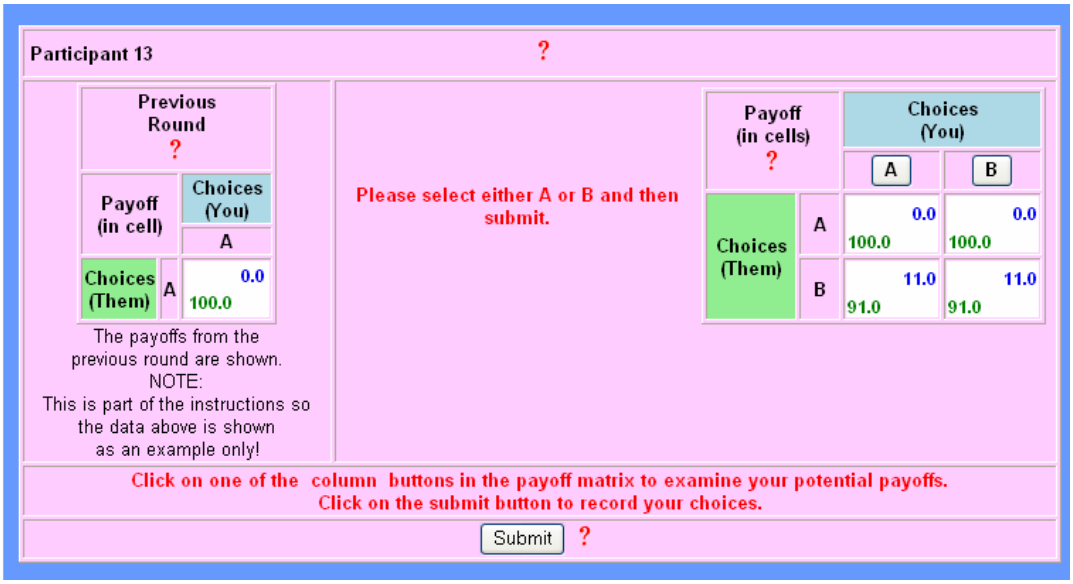

Figure 2a – Sample Subject Screen of Giver (T2)

Figure 2b – Sample Subject Screen of Receiver (T2)