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Fairness in Extended Dictator Game Experiments

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Fairness in Extended Dictator Game Experiments*

Felix Oberholzer-Gee and Reiner Eichenberger

Abstract

We test the robustness of behavior in dictator games by offering allocators the choice to play an unattractive lottery. With this lottery option, mean transfers from allocators to recipients substantially decline, partly because many allocators now keep the entire endowment for themselves (without playing the lottery). In our standard dictator game, the median transfer amounts to 41% of the dictators' endowment. Once the lottery option is present, the median transfer falls to zero. Introducing an additional unattractive choice thus leads subjects to violate the weak axiom of revealed preference (WARP).

KEYWORDS: dictator game, fairness

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I. Introduction

Dictator games first caught the attention of economists because non-cooperative game theory, assuming income-maximizing behavior, failed to predict the outcomes commonly observed in these experiments (Kahneman, Knetsch and Thaler, 1986; Camerer and Thaler, 1995). In this two-person game, the "dictator" has to decide what share $s \in [0,1]$ of his endowment he wants to pass on to a passive second player. While standard theory predicts $s=0$, at least one third of all subjects make positive offers. This result holds even in double-blind experiments which are less conducive to "fair" behavior than earlier experimental setups (Hoffman, McCabe, Shachat and Smith, 1994).[1] Eckel and Grossman (1996), using the same double-blind design, show that donations significantly increase if the recipient is generally agreed to be "deserving," suggesting that a desire to be fair is an important aspect of the game.

In view of these findings, it comes as no surprise that dictator game experiments have become an important vehicle to study individuals' "taste for fairness" (for surveys, see Roth (1995) and Konow (2003)). In theoretical work, the results from dictator experiments serve as a stepping stone to build models that are consistent with individual behavior in broad classes of games. For instance, Bolton and Ockenfels (2000) use results from dictator games to analyze how subjects resolve the trade-off between pecuniary gains and relative pay-off. In their view, dictator game results are "basic to an understanding of many other games."

Given the prominence of dictator game experiments, this paper sets out to further investigate the robustness of these experimental results. We present new evidence on dictator games with wider choice sets. As in the standard game, our dictators choose a share $s \in [0,1]$ of their endowment that they wish to pass on. In addition, they also have the option to purchase lottery tickets. The expected value of playing the lottery is negative, and we show that most subjects prefer not to purchase tickets outside the context of a dictator game. However, when both the lottery *and* the dictator game constitute the choice set, we observe two interesting changes in the behavior. First, the fraction of subjects who keep the entire endowment to themselves more than doubles. Secondly, the number of individuals who now play the lottery also increases relative to a baseline experiment where subjects choose between keeping the endowment and purchasing lottery tickets. Taken together, these two effects strikingly diminish the transfers which the passive players receive. In the standard game, the median

1 In their double-blind "random entitlement, exchange" treatment, Hoffman et al. (1994) find that close to 80% of all subjects pass on positive amounts.

transfer amounts to 41% of the dictators' endowment. Once the lottery option is present, the median transfer falls to zero.

The remainder of this paper is organized as follows. Section II presents a series of baseline experiments. In section III, we report the main results for dictator games with extended choice sets. We also describe a replication of the experiments. We discuss the main findings in section IV. Section V offers concluding comments.

II. Baseline Experiments

Although dictator games appear to be more sensitive to design issues than other bargaining games, the majority of dictator game experiments finds that allocators pass on between 10% and 30% of their endowment (Bolton, 1991; Hoffman et al., 1994). About 20% of all subjects split their endowment 50-50 (Forsythe, Horowitz, Savin and Sefton, 1994). As no strategic interaction between the two players takes place, various authors have given these results an equity interpretation. Several factors systematically influence the level of transfers in dictator games. Among them are the social distance between subjects and the experimenter (Hoffman, McCabe and Smith, 1996), the social distance between subjects (Bohnet and Frey, 1999), the relative price of making transfers (Sefton, 1992), and the justification for the allocation of property rights (Hoffman et al., 1994; Ruffle, 1998; Schotter, Weiss and Zapater, 1996). However, even in experimental environments that are not particularly conducive to fair behavior such as the "gangster game" in Eichenberger and Oberholzer-Gee (1998) and the "taking" institution in Bardsley (2005) and List (2007), many subjects do not choose the most selfish outcome. The experiments presented here offer a new test of the robustness of fair behavior in the context of dictator games.

A. Standard Dictator Games

We start by replicating standard dictator game experiments. Our subjects are undergraduate students at the University of Zurich without prior knowledge of game theory or experimental economics. The instructions for the dictator game were taken from Forsythe et al. (1994) and adapted for our purposes (see appendix A).[2] Allocators and recipients were assigned to two different rooms to guarantee between-subjects anonymity. We also provide for anonymity between

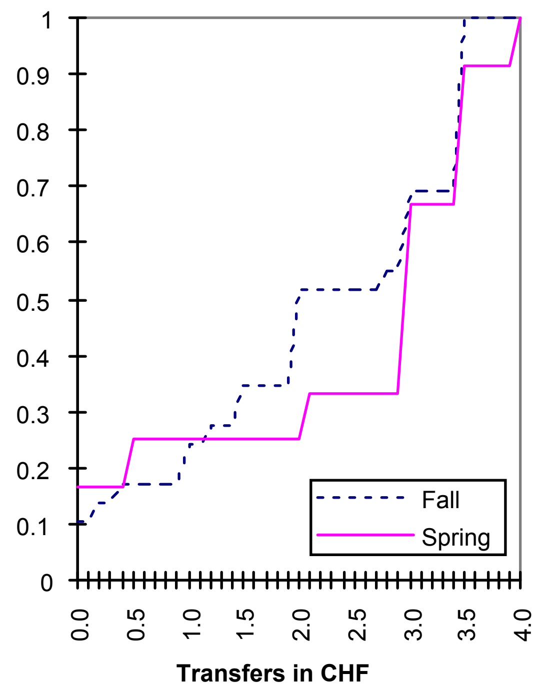
2 These instructions use the "provisionally allocated" language. Hoffman et al. (1994) show that this format yields the same results as an "exchange" frame for dictator experiments with random entitlements.

the experimenter and the subjects. Our procedure differs from the one described in Hoffman et al. (1994) in that we do not use a student monitor to collect the decision forms. When students have arrived and are seated, a box containing unmarked, sealed envelopes is passed from one subject to the next. Each student takes one of these envelopes out of the box. During this period, the experimenter remains in the front of the room. Thus, subjects see that the experimenter and the other students present cannot know who has picked which envelope. Each envelope contains the written instructions, a proposal form on which allocators note s and (1-s), the endowment of 7 Swiss Francs (approximately $5) in cash, and two envelopes that are marked with a letter and a number. This code identifies the recipient in the other room. The only information that allocators have about recipients is that this person is also an undergraduate student.

Allocators first read the written instructions. These are then repeated orally, allowing subjects to ask procedural questions. Subjects then fill in the proposal form and put the form and the cash transfer for the recipient in two separate envelopes. Next, the same box is passed around and subjects put both envelopes in the box. As before, the experimenter remains in the front of the room during this period and thus cannot detect who has given how much. Once all envelopes are in the box, it is taken to the room with the recipients where they retrieve their envelopes. This concludes the experiment.

The design used here is identical to the one we employed in earlier experiments (Eichenberger and Oberholzer-Gee, 1998). For both experimental series, Figure 1 shows the cumulative distributions of the transfers that recipients received. In both series, students transfer on average about 30% of their initial endowment. We cannot reject the hypothesis that both observations come from populations with the same mean (Mann-Whitney U test, $p=0.50$) and that the distribution of transfers to recipients is the same across these two series (Kolmogorov-Smirnov test, $p=0.53$). These results suggest that our design of the standard dictator game experiment is replicable if the same language and parameters are used, indicating that the profile of preferences captured in these experiments is stable.[3]

Figure 1: Cumulative distributions of transfers in two dictator game experiments.
(Spring 1998 and present experiments, N=12 and N=29, respectively)



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3 Dictator games have frequently been replicated. Forsythe et al. (1994) report replication across time. Hoffman et al. (1994) replicated the Forsythe distribution using identical instructions and parameters. One of the minor differences between our design and the one used by Forsythe et al. (1994) is that we present the dictator game in a form that subjects may interpret as a two-stage decision process. Allocators are first asked to propose how much the person in room B is to receive. Then they "decide" how much they wish to keep. We compared the results of our language with the outcome of an experiment that used the original Forsythe et al. (1994) instructions and the Zurich parameters (7 Francs, N = 11). We cannot reject the hypothesis that the two set of instructions lead to the same results (Mann-Whitney U test, p=0.79, Kolmogorov-Smirnov p=0.91). In what follows, we pool all three experimental series.

B. The Lottery Option

In the lottery experiment, we expand subjects' choice set. The standard economic model of behavior regards choices as determined by opportunity costs. Alternative uses of income affect the relative attractiveness of options in the choice set and hence guide decision-making. By providing cash incentives, experimenters found a clever way to introduce opportunity costs into laboratory decision-making. The allocator in a dictator experiment is entitled to the funds she did not pass on to the recipient, and she may use them at her own discretion outside the laboratory. Thus, transfers in the laboratory are commonly assumed to carry similar opportunity costs as (anonymous) transfers in the real world. One implication of this view is that an option which is contained in the original choice set (e.g., to make a zero transfer) will not become more attractive if this choice set is expanded (Sen, 1997). This requirement is referred to as the weak axiom of revealed preference (WARP) (Samuelson, 1938).

Standard theory thus makes a simple prediction for dictator games with an additional choice such as our lottery: WARP rules out that s or (1-s) increase as the lottery is introduced. To understand how the option to play a lottery affects choices in the dictator game, we thus need to know how attractive the lottery is.

To produce a baseline comparison, subjects were given a choice of either purchasing one lottery ticket or receiving a certain payment of 7 Francs (for the wording of these instructions, see appendix B). The price of the lottery ticket was identical to the allocator's total endowment (7 Francs). One group of subjects (N=18) faced a 50% probability of winning a prize of 10 Francs and a 50% chance of receiving nothing. For a second group (N=17), the prize was 8 Francs, while the probabilities and the zero payoff remained the same. Not surprisingly, most subjects preferred the certain payment of 7 Francs to a gamble with a negative expected value. 22.2% (prize 10 Francs) and 29.4% (prize 8 Francs) chose to purchase the ticket. The latter figure perhaps overstates the attractiveness of the lottery as some subjects appeared to have trouble believing that we would offer them such a miserable gamble.[4]

4 Despite clear oral and written instructions, some subjects did not believe that the prize of the lottery was only 8 Francs. They thought winners would be paid the prize and returned the price of the lottery ticket, making the total pay-off 15 Francs. Two subjects reported this misinterpretation in the questionnaire filled in after the session. Other students may have misunderstood the lottery option in similar ways without reporting it. In subsequent experiments, reported below, we made sure subjects understood the lottery payoff. We have no indication of confusion in these later experiments which yield similar results.

III. Extended Choice Sets

In this section, we report our main results for dictator game experiments where the allocator can play one of the two lotteries introduced above (for instructions, see appendix C).[5] Table 1 provides a first look at the results by listing the mean transfers to recipients in the standard and in the extended game, as well as the fraction of allocators who keep the entire endowment for themselves (not counting those who play the lottery).

Table 1: Comparison between transfers in dictator games with and without the option to play a lottery.
Zurich results, endowment 7 Francs (approximately $5)

	Mean transfer (median)	% Who keep cash endowment	% Who play lottery
Standard Dictator Game (N=52)	2.27 (2.90)	15.4%	--
"Lottery" Treatment Ticket Price CHF 7, Prize CHF 10 (N=23)	0.14 (0)	39.1%	52.2%
"Lottery" Treatment Ticket Price CHF 7, Prize CHF 8 (N=23)	0.61 (0)	39.1%	47.8%

As is evident from column 1 in Table 1, adding the lottery option to the dictator game leads to a substantial decrease in transfers. While allocators give away more than 30% of their endowment in the standard treatment, with the lottery, average allocations to recipients amount to about 5%. Median transfers

[5] As before, subjects did not need to publicly reveal which option they chose. The participants who wanted to play the lottery enclosed the ticket price of 7 Francs in an envelope marked with the letter L. Those who wished to pass on parts of their endowment to the recipient in the other room enclosed their transfer in an envelope marked with the letter B. The subjects who chose to keep everything left the "L" and the "B" envelopes empty. Once subjects had made their decision, everyone placed *all* envelopes in the box, making it impossible for other students and the experimenter to discern what subjects had done.

are zero when the lottery option is present. A single person decided to pass on a positive amount in the treatment where subjects faced the gamble with a prize of 10 Francs. 3 out of 23 subjects made positive transfers when the prize was 8 Francs.

These low levels of transfers are the result of two effects. First, as column 2 in Table 1 indicates, the number of subjects who allocate the entire endowment to themselves without “investing” in the lottery is one factor leading to low transfers. In the standard treatment, only 15% of all subjects behaved as predicted by an income-maximizing model of behavior. When the lottery option is present, almost 40% take their entire endowment. This difference is statistically significant (Mann-Whitney U test, p=0.024), and the observed behavior clearly violates WARP.

The second reason for the dwindling level of transfers is the increased attractiveness of the lottery option. Table 2 directly compares the number of subjects who choose to play the lottery when the dictator game option is present and when it is absent. Without the dictator game, keeping the 7 Francs is mostly preferred to playing either one of the low-value lotteries. The lotteries become more popular in the context of the dictator game. This increase in the number of subjects who play the lottery is significant for the gamble with a 10 Francs prize (Mann-Whitney U test, p=0.054), but insignificant for the less attractive lottery (p=0.246).

Table 2: Attractiveness of lotteries with and without the dictator game option. Zurich results, endowment 7 Francs (approximately $5)

	% Choosing lottery (dictator game absent)	% Choosing lottery (dictator game present)
Lottery Ticket Price CHF 7, Prize CHF 10 (w/o DG: N=18; with DG: N=23)	22.2%	52.2%
Lottery Ticket Price CHF 7, Prize CHF 8 (w/o DG: N=17; with DG: N=23)	29.4%	47.8%

A. Replication

How robust are these results across different subject populations? To what extent do our parameters drive the results of the lottery treatment? To answer these questions, we replicated both the baseline dictator experiments and the experiments including a lottery with undergraduate students at the University of Pennsylvania. The instructions and the experimental procedures were kept the same. The allocator's endowment in the Philadelphia experiments was $10, with $1 being the smallest unit of exchange. One difference between the two sets of experiments concerns the lottery. We wondered if the "all-or-nothing" nature of the lottery (the ticket price was equivalent to the total endowment) critically influenced our results. Thus, we offered subjects at Penn a lottery with tickets at a price of $1 each. Allocators were free to purchase any number of tickets they desired. Subjects faced a 50% probability of winning a prize of $1.25 per lottery ticket that they had bought and a 50% probability of winning nothing.[6]

In the baseline dictator game without the lottery option, Penn subjects made similar transfers as their Zurich counterparts (mean $2.33), despite the larger endowment ($10 in Philadelphia compared to $5 in Zurich). The Penn results are very similar to the findings of other US studies (see, e.g., Forsythe et al., 1994). The fraction of players who behave in an income-maximizing manner is 16.7%, again similar to the Zurich results. The second baseline experiment which offers the lottery option and the certain pay-off of up to $10 confirms that, in the absence of a dictator game, most students do not see the lottery as attractive. 11.1% of subjects chose to purchase tickets. Mean investment in the gamble was $0.44.

Table 3 reports the main results for the Philadelphia dictator experiments with the lottery option.

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6 Allocators won if their identification number and the roll of dice were both odd or both even. Thus, one's lottery tickets would all lose or all win.

Table 3: Comparison between transfers in dictator games with and without the option to play a lottery. Penn results, endowment $10

	Mean transfer (median)	% Who keep cash endowment	% Who play lottery
Standard Dictator Game (N=24)	2.33 (2.00)	16.7%	--
Lottery Treatment Ticket Price $1, Prize $1.25 (N=21)	0.62 (0)	47.6%	38.1%

Once the lottery is introduced, the level of transfers dramatically declines. As in the Zurich experiments, this is partly due to the larger number of players who keep the entire endowment and partly due to an increased attractiveness of the lottery. Almost half the Penn subjects choose to keep the $10 when the lottery is available. This is a significant increase over the standard treatment (Mann Whitney U test, p=0.027) and a violation of WARP. The total dollar amount that allocators walk away with (not counting their lottery investments) increases despite the fact that there is a third option (Mann-Whitney U test, p=0.089). This is a very strong result because the lottery option, which some subjects find more attractive than the original choices, naturally leads to a decrease in the amounts allocated in the standard dictator game.

As in Zurich, transfer levels also decline because the lottery becomes more attractive in the context of a dictator game (see Table 4). Average investments in the lottery roughly double, while the number of allocators who purchase lottery tickets more than triples. Compared to the baseline results, the latter increase is statistically significant (Mann-Whitney U test, p=0.058), while the former is not.

Table 4: Comparing the Relative Attractiveness of the Lottery.
Penn results, endowment $10, ticket price $1, prize $1.25
(w/o DG: N=18; with DG: N=21)

	Dictator game absent	Dictator game present
Mean investment in lottery (median)	$0.44 (0)	$0.86 (0)
% of subjects who invest in lottery	11.1	38.1

IV. Discussion

Once we expand the set of choices given in the standard dictator game by introducing the option to play a lottery, the level of transfers declines markedly. This result is robust across different student populations and lottery parameters. The low level of transfers is due to subjects more often keeping the entire endowment to themselves and, according to some measures, to an increased attractiveness of the lottery. The behavior in these games clearly violates standard notions of rationality. Economic theory assumes that subjects consider alternative uses of their experimental income when deciding on how to split the pie. Obviously, outside the laboratory, income earned in the experiment offers opportunities that are at least as attractive as the miserable gamble that we introduced in the extended game. Yet, making this additional choice explicitly available in the experiment changes subjects' behavior in unexpected ways.

The results presented so far are consistent with the principles of asymmetric dominance, first discovered by Huber, Payne and Puto (1982). This theory predicts that an alternative x becomes more popular if the set of options is enlarged by a choice that is dominated by x.[7] Asymmetric dominance is important in marketing: For example, a San Francisco based retail business

7 Similar predictions are made by focal point theories. Dhar and Simonson (1992) have shown that focal points are systematically considered more attractive than other alternatives. One may speculate that we created a focal point by presenting choices in a certain sequence (Houston, Sherman and Baker, 1989) or by offering more choices that share a specific dimension (two selfish, but only one fair alternative).

almost doubled its sales of a particular bread-baking appliance by adding an inferior choice to its catalogue (Simonson and Tversky, 1992).

For our experiments, asymmetric dominance predicts the observed choices. Assume that subjects evaluate the alternatives in our treatments on the basis of two dimensions: fairness and own income. In the standard dictator game (when comparing fairness and income only), most subjects allocate some funds to both purposes. That is, no alternative clearly dominates the other. However, with our third choice, the lottery, we add a dominated alternative: From a fairness perspective, playing the lottery is equivalent to taking all the cash because the recipient does not receive anything in either case. However, based on their expected value, the cash option (mostly) dominates buying the gamble. Asymmetric dominance predicts that the dominating choice (the cash option) becomes more attractive. And indeed, this is what we observe.

Are our results due to asymmetric dominance? We further tested the explanatory power of this theory with a variation of our lottery treatment. In a new experiment, the lottery prizes were not paid to the allocators who bought the lottery tickets, but to their recipients. For this treatment, asymmetric dominance predicts that transfers in the dictator game will increase because these transfers dominate the expected value of the lotteries.

Our subjects were undergraduates at Penn. All experimental parameters were kept the same, but prizes were now to be paid to recipients. Table 5 reports the results of this treatment.

Table 5: Transfers in dictator games with and without the option to play a lottery, prize of the lottery goes to recipient.
Penn results, endowment $10

	Mean transfer $ (median)	% Who keep cash endowment	% Who play lottery
Standard Dictator Game (N=24)	2.33 (2.00)	16.7%	--
"Lottery" treatment Ticket Price $1, Prize $1.25 (N=21)	0.71 (0)	66.6%	4.8%

The prediction of asymmetric dominance is not borne out. Although the lottery prize now goes to the recipient, adding the lottery still leads to a substantial decrease in the level of transfers. Two-thirds of all subjects now walk out with all the cash. Again, this is a significant increase compared to the standard dictator game (Mann-Whitney U test, p=0.002). Only one subject chose to play the lottery. Extending the choice set by an unattractive element thus represents a powerful framing effect that is not explained by the principles of asymmetric dominance.

A second conjecture is that the observed change in behavior is due to an increase in cognitive load.[8] Our experimental task becomes more complex when the option to play the lottery is present. Research in psychology has documented that subjects tend to use simpler decision-making rules when faced with higher cognitive loads. For example, individuals restrict their attention to fewer decision parameters when the task at hand requires greater cognitive effort (Nichols, Kenneth and Beach, 1990; Olshavsky, 1979; Payne, Bettman and Johnson, 1993). One interpretation of our results is that some subjects ignore the tradeoff between income and fairness because it is cognitively challenging to determine the optimal split of funds between the three options. Instead, they focus solely on the income dimension, explaining the more selfish behavior that we observe in our data.

To test the effect of cognitive load on transfers, we replicated the dictator game, using a common memory task to increase subjects' cognitive load. At the end of the instructions for the standard dictator game, we asked subjects to memorize ten words and told them we would test their memory at the end of the experiment. To rule out income effects, we made it clear that the performance in the memory test would not be payoff relevant.

Our subjects are undergraduates at the University of Fribourg. The endowment was 10 Swiss Francs. The results for the standard game and the game with the memory task are reported in Table 6.

Table 6: Transfers in dictator games with and without memory task.
Fribourg results, endowment 10 Francs

	Standard Dictator Game (N=22)	Dictator Game with Memory Task (N=24)
Mean transfer CHF (median)	2.95 (3)	3.71 (5)

8 We thank the two referees for pointing out this possibility.

Subjects do not become more selfish when we increase cognitive load. Rather, they become slightly more generous. However, we cannot reject the hypothesis that the two treatments have the same mean (Mann-Whitney U test, p=0.15) and the same distribution (KS test, p=0.581). Our results also show that the memory task was not trivial. On average, subjects correctly remembered 4.41 words. There is no correlation between the performance in the memory test and subjects' generosity. We conclude that increases in cognitive load, at least as measured here, do not seem to explain the more selfish behavior that we observe in the lottery treatment.

V. Conclusions

The results presented here document that allocators in dictator game experiments choose to make much smaller transfers when their choice set includes the option to play an unattractive lottery. This result is robust across different subject populations and lottery parameters. The decline in transfers is partly due to dictators more often keeping the entire endowment for themselves. For some parameters, we also find that the lottery becomes more attractive if it is offered in the context of a dictator game.

Previous research established that dictator game behavior is sensitive to variations in experimental design. However, the effects of earlier variations in the design of dictator games are often not difficult to reconcile with theory. For instance, experimenter demand effects (Hoffman et al., 1996) can be interpreted as a rational response of dictators who see themselves in a repeated game with the experimenter. Similarly, Eckel and Grossman's (1996) finding that dictators become more generous when they play with "deserving" individuals is consistent with models that recognize altruistic motivations. In contrast, our findings cannot easily be reconciled with economic theory because subjects violate basic postulates of rational behavior. At a minimum, the results imply that it is problematic to use the transfers observed in the context of the standard game to make general statements about individuals' "taste for fairness." In this respect, our results are similar to the findings in Eichenberger and Oberholzer-Gee (1998), Bardsley (2005) and List (2007) who observe far less fairness when dictators are allowed to take money from their counterparts.

The extended dictator game poses an interesting question for future research. In economics, experiments are built on the premise that monetary payments induce rational behavior in the sense that subjects contemplate alternative uses of their experimental income before making decisions in the laboratory. Thus, subjects are assumed to behave in the lab as they would in the real world because real-world opportunities are constantly present in the form of opportunity costs. In light of the results presented here, it seems interesting to investigate whether extending other choice sets can induce violations of rationality. For example, there is now a substantial experimental literature which documents reciprocal behavior (for a survey, see Fehr and Gächter, 2000). Will subjects who were treated kindly continue to respond in kind in the presence of extended choice sets?

Appendices

A. Instructions for standard dictator game

Welcome! You are about to participate in an economics exercise. In addition to the $3 you already received for participation, you may earn additional money, which will also be paid to you in cash.

In this exercise each of you will be paired with a different person who is in another room. This is room A, you are the person in room A. Your counterpart in the other room is the person in room B. You will not be told who the person in room B is either during or after the exercise, and the person in room B will not be told who you are either during or after the exercise. Nobody, including the experimenter, will ever know what decisions you made during this exercise. You will notice that there are other people in the same room with you who are also participating in the exercise. You will not be paired with any of these people. The decisions that they make will have absolutely no effect on you nor will any of your decisions affect them.

The exercise will be conducted as follows: A sum of $10 has been provisionally allocated to each pair of participants. The person in room A can allocate the $10 between two different uses. More specifically, the person in room A will propose

(i) how much of this money the person in room B is to receive. You can allocate all, some or none of the money to the person in room B.
(ii) how much of this money the person in room A (yourself) is to receive. You can allocate all, some or none of the money to yourself.

The two amounts must add to $10.

To make this decision, the person in room A will

1. fill out the original and the copy of the "proposal form". The copy of the proposal form is for your own records. The proposal consists of an amount that the person in room B is to receive (entered on line {2}), and the amount that the person in room A is to receive (entered on line {3}). The two amounts must add to $10. If you are the person in room A you will have five minutes to come to a decision about your proposal. Do not be concerned if other people make their decisions before you.

2. The person in room A then divides the 10 dollar bills according to the proposal form. The person in room A puts the amount that the person in room B is to receive in the envelope that is marked with your identification number and starts with the letter "B" (e.g., B19). The person in room A puts the original proposal form in the envelope that is marked with your identification number and starts with the letter "P" (e.g., P19). You will keep the money allocated to yourself.
3. Participants will then pass around a box. Place the "B" envelope and the "P" envelope with the proposal form into the box. Then take the box and bring it to the next participant. The "B" envelopes will then be sent to the person in room B.
4. This concludes this exercise and you may leave.

Are there any questions?

B. Instructions used for assessing the attractiveness of the lottery option

Welcome! You are about to participate in an economics exercise.

In this exercise you will be asked to make a decision. You will notice that there are other people in the same room with you who are also participating in the exercise. The decisions that they make will have absolutely no effect on you nor will any of your decisions affect them.

The exercise will be conducted as follows: A sum of $10 has been provisionally allocated to you. You can allocate the $10 between two different uses. More specifically, you will propose

(i) how much of this money you wish to keep. You can allocate all, some or none of the money to yourself.
(ii) a number of lottery tickets to be bought. You can allocate all, some or none of the money to the purchase of lottery tickets.

The two amounts must add to $10.

Each lottery ticket costs $1. At the end of the exercise, we will roll two dice. Notice the identification number (on line {1}) of your proposal form. If the identification number is even and the roll of dice is even, you win $1.25 per lottery ticket bought. Otherwise, you win nothing. If the identification number is odd and the roll of dice is odd, you win $1.25 per lottery ticket bought. Otherwise, you win nothing.

To make this decision, you will

1. fill out the original and the copy of the "proposal form". The copy of the proposal form is for your own records. The proposal consists of an amount that you wish to keep (entered on line {2}), and a number of lottery tickets to be bought (entered on line {3}). The two amounts must add to $10. You have

five minutes to come to a decision about your proposal. Do not be concerned if other people make their decisions before you.

2. Divide the 10 dollar bills according to the proposal form. Put the money for the lottery tickets (if any) and the original proposal form in the envelope that is marked with your identification number and starts with the letter "L" (e.g., L19). You will keep the money allocated to yourself.
3. Participants will then pass around a box. Place the "L" envelope with the proposal form into the box. Then pass the box to the next participant.
4. The roll of the dice concludes this exercise.

Are there any questions?

C. Instructions for dictator game with lottery option

Welcome! You are about to participate in an economics exercise. In addition to the $3 you already received for participation, you may earn additional money, which will also be paid to you in cash.

In this exercise each of you will be paired with a different person who is in another room. This is room A, you are the person in room A. Your counterpart in the other room is the person in room B. You will not be told who the person in room B is either during or after the exercise, and the person in room B will not be told who you are either during or after the exercise. Nobody, including the experimenter, will ever know what decisions you made during this exercise. You will notice that there are other people in the same room with you who are also participating in the exercise. You will not be paired with any of these people. The decisions that they make will have absolutely no effect on you nor will any of your decisions affect them.

The exercise will be conducted as follows: A sum of $10 has been provisionally allocated to each pair of participants. The person in room A can allocate the $10 between three different uses. More specifically, the person in room A will propose

(i) how much of this money the person in room B is to receive. You can allocate all, some or none of the money to the person in room B.

(ii) how much of this money the person in room A (yourself) is to receive. You can allocate all, some or none of the money to yourself.

(iii) a number of lottery tickets to be bought. You can allocate all, some or none of the money to the purchase of lottery tickets.

The three amounts must add to $10.

Each lottery ticket costs $1. At the end of the exercise, we will roll a dice. Notice the identification number (on line {1}) of your proposal form. If the identification number is even and the roll of dice is even, the person in room A wins $1.25 per lottery ticket bought. Otherwise, the person in room A wins nothing. If the identification number is odd and the roll of dice is odd, the person in room A wins $1.25 per lottery ticket bought. Otherwise, the person in room A wins nothing.

To make this decision, the person in room A will

1. fill out the original and the copy of the "proposal form". The copy of the proposal form is for your own records. The proposal consists of an amount that the person in room B is to receive (entered on line {2}), the amount that the person in room A is to receive (entered on line {3}), and a number of lottery tickets to be bought (entered on line {4}). The three amounts must add to $10.

   If you are the person in room A you will have five minutes to come to a decision about your proposal. Do not be concerned if other people make their decisions before you.
2. The person in room A then divides the 10 dollar bills according to the proposal form. The person in room A puts the amount that the person in room B is to receive in the envelope that is marked with your identification number and starts with the letter "B" (e.g., B19). The person in room A puts the money for the lottery tickets and the original proposal form in the envelope that is marked with your identification number and starts with the letter "L" (e.g., L19). You will keep the money allocated to yourself.
3. Participants will then pass around a box. Place the "B" envelope and the "L" envelope with the proposal form into the box. Then take the box and bring it to the next participant. The "B" envelopes will then be sent to the person in room B.
4. The roll of the dice concludes this exercise and you may leave. Are there any questions?

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