

Some Doubts About Measuring Self-Interest Using Dictator Experiments: The Costs of Anonymity*

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ABSTRACT: Traditionally, economists have assumed self-interest governs economic choices. Recently, some social scientists and economists, especially those working in game theoretic and experimental areas, have begun to treat self-interest as a testable hypothesis. One important vehicle for evaluating self-interest has been a class of experiments called ‘dictator’ experiments. We believe that these experiments may have a flaw in their design which leads researchers *to overstate, systematically*, the role of self-interest in individuals’ motivations. Double-blind experiments, designed to create conditions of privacy and anonymity, may engender doubts in subjects regarding the existence of pairings and the disposition of any money they share. Moreover, subjects may view the experiment as a game. We test these conjectures using both traditional and modified dictator experiments.

Keywords: self-interest, dictator experiments, experiments, other-regarding, altruism

JEL Classification: C90, C91, and D64

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SOME DOUBTS ABOUT MEASURING SELF-INTEREST USING DICTATOR EXPERIMENTS: THE COSTS OF ANONYMITY

Traditionally, economists have assumed self-interest governs economic choices. Recently, some social scientists and economists, especially those working in game theoretic and experimental areas, have begun to treat self-interest as a testable hypothesis. One important vehicle for evaluating self-interest has been a class of experiments called ‘dictator’ experiments. We believe that these experiments may have a flaw in their design which leads researchers *to overstate, systematically*, the role of self-interest in individuals’ motivations. We test this conjecture, using both traditional and modified dictator experiments.

INTRODUCTION: EXPERIMENTS TO MEASURE SELF-INTEREST

In experimental political science and economics the dictator experiment has become a standard test of an individual’s motivation. Hoffman, et. al. (1994) developed the experiment to identify the degree to which individual choices were self-interested. In dictator experiments a fire-wall of anonymity shields subjects’ identities both from the experimenter and other subjects so as to deprive the subject of reputational, or other, secondary gains from their choices in the experiment.

Initially, researchers conjectured that dictator experiments would confirm the empirical prevalence of self-interest as a universal decision template: but it hasn’t worked out quite that way. The degree to which self-interest accounts for observed behavior in laboratory experiments seems sensitive to a number of attributes of the choice situation, even when anonymity is insured. Supporting the original conjecture, results seem to indicate that higher levels of anonymity in dictator protocols lead to lower levels of seemingly other-regarding behavior.¹ On the other hand, Roth, (1995, p. 282) showed that a laboratory experiment framed in a market context generates choices which are more in conformance with self-interest than does a ‘dictator’ experiment or other non-market environments. Current efforts to establish a simple and purely self-interested explanation for choice seem to have foundered, or at least, stalled. Hence, the problem of more complex individual motivations continues to haunt theorists of both economic and ‘non-market’ decision making.

Dictator Experiments:

How, roughly, is a typical dictator experiment run? Individuals arrive at one of two rooms, call them Room A and Room B. A monitor is randomly chosen from subjects in Room A and runs the experiment to increase the credibility of the instructions and to reduce experimenter effects. Other subjects in that room each receive an envelope with \$10 in it. They are told that they can keep any amount of the money and leave the rest in the envelope for an individual, in Room B, with whom they have been anonymously paired. They must choose, in total privacy, and with total anonymity, how much of the money to take out of the envelope to keep for themselves and how much to leave in the envelope. After the decision, the individual leaves Room A and the

1/ In the early 1980's two of us (Frohlich, et. al.1984) conducted experiments similar to dictator experiments both in motivation and in some design details. Those experiments also maintained anonymity between the chooser and recipient. But the experimenter was able to identify, at a later date, how much any individual chose to leave. Thus, those experiments might have led the subject to make a choice in order to gain a reputational benefit with the experimenter. In any case, we measured comparable levels of other-regarding behaviors to those found in dictator experiments.

experiment. What is left in the envelope is delivered to the paired person in Room B and is recorded by the experimenter.

The experiment is designed so that neither the experimenter nor the recipient knows the identity of the individual who leaves the money in the envelope. This anonymity is designed to preclude a reputational gain or a reward associated with appearing to conform to norms of fairness, unselfishness, or other values imputed to the experimenter. The realization that these *ad hoc* and context-dependent incentives needed to be, and could be, controlled for was a significant step forward. Following Hoffman et al.'s (1994) work, economists have insisted on designs which incorporate the properties of privacy and anonymity precisely because they wished to exclude extraneous reputational effects on behavior.

Hoffman, McCabe and Smith (1996) provide an interesting discussion of the variation of money left for others as a function of different degrees of anonymity. They introduce the concept of social distance, defining it as "the degree of reciprocity that subjects believe exist within a social interaction (p. 654)."² They examine the role social distance plays in the dictator's decision making process and use it to question the assumption of self-interest. They conclude that isolated anonymity discourages any belief in reciprocity within a social interaction and hence allows self-interest to be observed.

Eckel and Grossman (1995 and 1996) conjectured that the relatively high level of money kept in dictator experiments might be a result of the absence of any recognizable social context provided in the experiments. They argued that the lack of context led to a psychological disconnect between the dictator and the potential recipient. They designed alternative experiments with specific contextual understandings. Following up on that research line, Frohlich and Oppenheimer ran two pilot experiments (one in Winnipeg and one in Japan) in which subjects performed tasks. The amount divided by the dictator was income generated by the tasks performed by the dictator and a paired subject in a second room.³ We conjectured that since a portion of the money the dictator had to distribute was the product of the other's work, the dictator would view the other as entitled to more money and, accordingly, would leave more. Contrary to expectations, the pattern of leaving was similar to that found in traditional dictator experiments. With a little help (please see the acknowledgments above) we concluded that the design of the traditional dictator experiment might be delivering an unforeseen effect.

Anonymity and privacy were conjectured to allow self-interest free reign. To insure anonymity in these double-blind designs the dictator and the recipient never see each other.⁴ But this has a further implication. Dictators can reasonably doubt the existence of the individuals in the other room. Any such doubts would change the incentives of individuals motivated by either a desire to make a 'fair division,' or by any other form of other-regardingness. If an altruistic dictator in Room A does not believe in the presence of others in Room B, she may well decide to

2/ Although their descriptive language doesn't show it, in this article, their tests stress variation in the anonymity in the subject - experimenter relationship.

3/ Ruffle (1998) reports on a similar experiment.

4/ Some versions of dictator experiments don't rely on the existence of a second room. So, for example, Eckel and Grossman (1996) ran some dictator experiments in one room. In their design what was left in the envelope was delivered to a charity. Dickhaut, Hubbard and McCabe (1995) and Berg, Dickhaut and McCabe (1995) use a multi-staged setup, which reveals the existence of the other paired individual.

keep all the money and would appear to be motivated by simple self-interest. Such behavior would (erroneously) be interpreted as confirming the self-interest assumption.

Our basic question is how dictators' orientations toward the experiments affect their behavior. There are two parts to this question. First, we wonder how the dictator's doubts about the existence of others who would receive any money left, affect the amount the dictator leaves in the envelope. Second, we conjecture (thanks to a suggestions of Howard Harmatz) that if the dictator views the experiment as a game it will affect her behavior. Keeping money would then be a strategy for winning and could not be interpreted as a straightforward indicator of raw self-interest or selfishness. After all, we don't argue that Wayne Gretzky's competitive playing of hockey is evidence of his self-interest - it is an expected part of the game.

RESEARCH DESIGN

To test for the potential effects of these 2 factors on behavior we modified the design of the dictator experiments. The modifications proceeded through a number of phases. The initial modification involved running a set of traditional dictator experiments with the addition of one step: an anonymously administered questionnaire to measure the beliefs of subjects in Room A regarding the veracity of the experimental description.

In doing this, care needed to be taken to maintain the anonymity of the subjects. We preserved 'double anonymity' by having an extra administrator in the hall outside Room A. Each envelope which the subjects received in Room A contained a chit identifying the number of that envelope. After making a decision regarding how much money to leave in the envelope, subjects deposited the envelope in a box in the room. They then exited *with the chit*. The extra administrator, who had not been in the room, and thus could not identify anything that had gone on, handed each subject a questionnaire and a blank envelope. The subject filled out the questionnaire and put it, with the chit (identifying the number of their original envelope), in the new envelope and deposited it in a second box in the hall. The questionnaire therefore had a numbered chit associated with it and the responses to the questionnaire could be correlated with the amount of money previously put in the numbered envelope in Room A.

We tested the relationship between those beliefs and how much money was left in the envelope. In a minor variation of that design, one Maryland experiment was run in a 2-room facility with a common ante room or vestibule. The common vestibule enabled individuals to be given instructions simultaneously. Any questions and answers regarding the instructions were also audible to both rooms. Such physical evidence of the existence of a second room was believed by the experimenters to have the potential to increase the subjects' trust in the experimenters' description of the setup. If trust in the existence of people in Room B were a factor in the behavior, changes in trust should show up as changes in observed behavior.

Finally, we tried to minimize doubts about the existence of others and the veracity of the experimental design by constructing an experiment in which all subjects were in one room. The 'One Room Dictator Experiment' varied little from the traditional design except for the physical arrangement of the subjects. Instead of having Room A and B, the experiment was conducted in Room A only. *Every* subject got an envelope. Each envelope contained a chit with a number on it. The chit was used (in part) to pair the participants after the decision-making process was completed. Some envelopes contained money and blank slips, others only blank slips. All participants were directed to the privacy booths to make their decisions. Once all decisions were made, the envelopes' contents were distributed and recorded.

We constructed a number of questions designed to elicit subjects' beliefs regarding aspects of the experiments.⁵ Because the One Room experiment differed, we had to vary the questionnaire slightly.⁶ The respondents were asked to express their degree of agreement on the following scale:

Agree Strongly 0 1 2 3 4 5 6 7 8 9 10 Disagree Strongly

The statements were:

1. I trusted that the experiment was being conducted in the way that it was described to me.
2. I am sure that there really are people in Room B. [1R:] I am sure that there really was a person paired with me.
3. I am sure that the money I left in the envelope will be given to the person in Room B with whom I have been paired. [1R:] I was sure that the money I left in the envelope was going to be given to the person with whom I had been paired
6. I viewed the experiment as a sort of "game" in which I was a player trying to win.

They were also asked the following open-ended question:

7. Please tell us why you made the decision you did about what you left in the envelope. (Feel free to write in any other comments you might like to make about the experiment.)

Significant findings regarding relationships between answers to these questions and amounts left would call into question the classical interpretations of the dictators' keeping money as reflecting only self-interest.

Two caveats must be entered. First, as Catherine Eckel noted in a discussion of this design, putting all subjects in one room also decreases the amount of social distance between subjects. If the Hoffman, McCabe, and Smith interpretation is correct it should therefore lead to higher contribution levels. To address that concern we also examine the efficacy of a One Room experiment in removing subjects' doubts and increasing the amounts of money they leave. Second, dictators could be using the questionnaire to rationalize their self-interested behavior. Those who keep more money could express more doubts about the experiment to justifying their selfish behavior. We test the degree to which such a potential confounding effect of post-hoc rationalization is a threat to our interpretation of the data by comparing responses of dictators and recipients.

EXPERIMENTAL RESULTS:

We conducted experiments both in Manitoba and Maryland. The basic design and the modifications for the one room experiment were as similar as possible to the Hoffman et al. (1994) design. Five experiments were run. Four were 2-Room Experiments, (two in Maryland and two in Manitoba). A single One Room experiment was run in Maryland. Each subject received a \$5 payment for showing up. In all, 51 subjects showed up in Room A for the two room experiments. Of these 4 were monitors and 6 received only blanks. Thirty-five subjects

5/ The full list of questions appears in the Appendix. The questions displayed here are those which provided the strongest results.

6/ The questions from the One Room experiment (in the cases when they were modified) are located after the original questions and are preceded by a "[1R:]" after the original question.

participated in the One Room experiment. One was the monitor, and 17 were each given envelopes with only blank pieces of paper. Thus 58 subjects received envelopes with money to divide.

One of the first results to consider is how much money subjects left in the envelopes. The data in Table 1 gives that information at a glance.

Table 1: The Pattern of Money Left - All Subjects														
Location & Treatment	Money Left in the Envelope													
	0	1	2	3	4	5	6	10	Total\$	N	Means	Modes		
	8	4	0	1	2	5	0	2	\$ 60	22	2.7	0		
	9	4	1	0	0	5	0	0	\$ 31	19	1.6	0		
	6	2	2	0	0	6	1	0	\$ 42	17	2.5	0 & 5		
Total (in Numbers)	23	10	3	1	2	16	1	2	\$133	58	2.3			
Total (in per cent)	40	18	5	2	4	29	2	4						100%

If one considered only the mode of the distributions one might be tempted to conclude that the participants behaved in a self-interested (and, in the Nash sense, rational) manner, but, in keeping with our caveat above, a careful examination of the numbers does not support this notion. Only a minority (40%) behaved in a purely selfish fashion. The majority (about 60%) of the participants, left some amount for the person with whom they were paired. This is well above the 20% “error” rate noted by Saijo and Yamiguchi, 1992. and Iwakura and Saijo, 1992 who showed that even in pure cooperation games one often gets levels of cooperation hovering at only around 80% due, presumably to subject error. The observed behavior cannot fairly be characterized as self-interested. How then are we to interpret their behavior? This is the principle question to be considered. But before proceeding with that analysis a few questions about some of the outliers in the data need to be addressed.

Defining The Subsample for Analysis:

An examination of the data in Table 1 reveals an anomaly. Two Canadians left all their money in the envelope. In their responses to the questionnaire the reasons they gave for leaving all the money indicated that their behavior was not likely to contribute to our understanding of how the experimental design might fail to represent a subjects’ degree of self-interest.

Since we are interested in testing for the exaggeration of the evidence of self-interested behavior as a function of both doubt about the experimental procedures, and perceptions of the experiment as a game, the behaviors of these 2 outliers appear to be somewhat irrelevant. Consequently these cases were removed from the data analysis. Subsequent discussions with others who have conducted dictator experiments confirmed that they too had experienced occasional outliers of this type who were excluded from the analysis, although the exclusions were not always reported explicitly in published reports of research.

Figure 1 illustrates the distribution of the money left with the 2 outliers excluded. Given the bi-modal distribution of that variable, a standard linear regression model would be inappropriate. To get around the problems of using regression with a bimodal distribution, we can reconceptualize leaving money as a bimodal choice (or U distribution), recode it accordingly, and

analyze the data via probit. Of course, such a recoding, by definition, involves some distortion of the data and introduces the possibility of arbitrariness. But the shape of the distribution seems to warrant treating it as bimodal and simplifying it to a binary distribution. Thus, we had to decide on exactly what measure we should use to operationalize “leaving money in the envelope.”

The most straightforward way might appear to be considering all acts of leaving nothing as different from leaving any amount at all. This would give us a dichotomous variable which would exactly mirror the predictions of the Nash theory. In other words, in such a model, the dependent variable would have 2 values: leaving nothing or leaving something. There are a few problems with this approach.

Consider the bimodal distribution in Figure 1. This method would assign a subject who left only one dollar the same value in the dependent variable as a subject who left five or six dollars. But leaving \$1.00 does not mean the same thing as leaving a \$5.00. Treating them the same would appear to do violence to the data since leaving \$1.00 appears, on the continuum, to be more closely associated with the left hand mode.

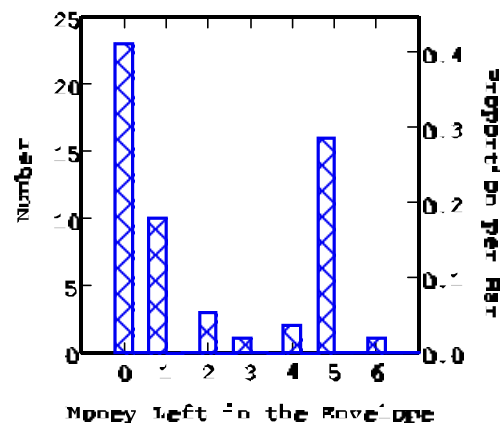


Figure 1: Distribution of Money Left - without the 2 outliers

Some further reflection raises the possibility of treating a subject who left only one dollar as a person who was engaging in a form of tokenism. Leaving very little, in this context, can reasonably be considered as more or less the same as leaving nothing. It appears to us to be closer to that than it is to sharing equally. The analogy is to treat our distribution loosely in the way one might classify individuals who tip in a restaurant. A one dollar tipper on a hundred dollar meal arguably has more in common with someone who does not tip at all than he or she has with someone who leaves a twenty dollar tip. We use this more ‘flexible’ notion as the interpretation of “leaving money.” And to make the distinction sharp, we dropped the cases where only \$2 or \$3 were left in the envelope.⁷ Hence leaving 0 or 1 dollars was equated and coded as 0 while leaving 4, 5, or 6 dollars were all coded as 1 in the construction of a binary dependent variable. Thus, our binary measure treats giving \$1 or less as “basically selfish” and treats those leaving \$4 or more as “other-regarding.”

As noted above, we are concerned with two possible sources of confound in dictator experiments. One is subjects’ doubts about the experiment and the other is their possible orientation to the experiment as a “game.”

^{7/} It must be emphasized that the purpose of dropping these cases is to have the data which is being considered reflective of the sense of the binary dependent variable (high or low amounts left). It is not chosen to get a ‘best fit’ to the data. We should also note that none of the results hinge upon dropping the cases where 3 or 2 was left.

Of the 58 subjects only 46 were exposed to the final version of the questionnaire which contained the question eliciting subjects' perceptions of the experiment as a game. The final constraint on the sample, therefore, consists of restricting it to the individuals who gave responses to the "game" question. Combining those 3 exclusions (the 2 outliers, and those who did not receive the question on "game," and those subjects who left \$2 or \$3) leaves us with 41 data points for analysis. The distribution of the money left by these individuals is shown in Figure 2. It closely parallels the Distribution in Figure 1.

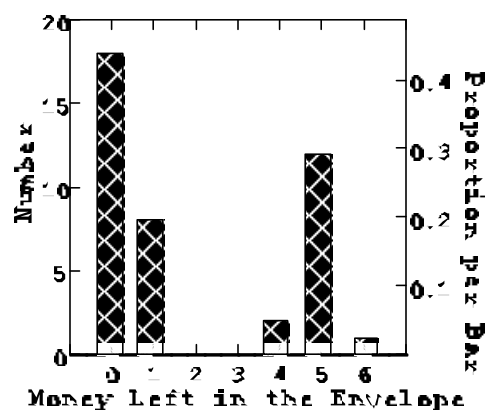


Figure 2: Pattern of Money Left: Final subsample

Beliefs and Money Left:

The first question to be explored is whether there is a significant difference in the beliefs reported by those individuals who left substantial amounts of money and those who did not. To explore this, t-tests were run on the answers to the questions identified above (see Table 2).

Table 2: Differences in Beliefs Between High and Low Givers				
Questions	Means of Responses			
	High Givers	Low Givers	T-stat	Prob*
Not Sure description was accurate	0.733	2.423	1.810	.039
Not Sure that the money would be given to person with whom paired	2.267	4.962	2.642	.006
Not Sure there were real people paired	3.533	5.654	1.869	.035
Did Not View experiment as a game	7.133	4.385	2.695	.005
N =	15	26		
* all reported are one tailed				

For each question, the responses were significantly different between the two groups. Those who gave more doubted the design less and were less oriented toward the experiment as a game.⁸ These results motivate us to see if we can explain the behavior using their reported doubts and orientations toward the experiment. The next section employs a probit analysis to explore this question.

Explaining Money Left Using a Probit Analysis:

8/ While the subjects' responses were distributed across the response continuum, they did diverge from the normal with a second mode at one end of the continuum. When responses were transformed into binary categories, Chi-square tests of differences between the groups supported the t-tests.

The basic model employed is a probit in which the two values of the dependent variable can be thought of as “other-regarding” (leaving more than 3) and “self-interested” (leaving less than 2). We choose this operationalization, prior to seeing results, as the most sensible. But a number of models using different combinations of independent variables account for the data quite similarly, probably because the measures of doubt are fairly highly correlated. For example, each of the variables in Table 2, taken singly, produces a significant Probit model. We present the one model based on the variables of doubts and orientations which generates the best fit to the data.

The model portrays the relation between the money left (recoded as high and low as discussed above) as a function of both the dictator’s doubts about the fate of the money left (how unsure she felt that the money would be given to the other person she was said to be paired with) and her orientation toward the experiment as a game. Both of those variables, and their interaction, are entered into the probit analysis. The use of the interaction reflects our conjecture about the relationship between these two variables. (See Table 3.)

Table 3: Conjectured Relation Between Game, Beliefs in Design, and Giving		
Orientation Toward the Experiment as a Game	Belief That the Money Was Being Given to Another	
	Certain	Doubting
As a Game to Win	Give Very Little	Give Very Little
Not As a Game to Win	Give More	Give Very Little

If the dictator were oriented toward seeing the situation as a ‘game’ which she was trying to win, doubts would enter into behavior in a different way. If the situation is seen as a game to get as much as possible compared to the other person, the dictator will be motivated to leave next to nothing regardless of her doubts about the design and the existence of the other person. Only if she doesn’t think of the experiment as a game to be won would her belief in the design lead her to leave money. Hence, different behavior is to be expected among those who think of the experiment as a game and those who do not and the crossed variables have an intuitive interpretation. The model’s explanatory power is relatively homogenous across treatments, and it is relatively parsimonious and simple to interpret.

Table 4: Relating the Money Left to Subjects' Doubts Regarding the Experiment⁹**Probit Analysis**

Dependent Variable: Money Left (Recoded as above) N = 41

Number "basically selfish": 26; Number "other-regarding": 15

Results of estimation: Log Likelihood: -19.505

Variable	Estimate	S.E.	t-ratio	p-value
CONSTANT	-0.736	0.287	-2.566	0.010
Did Not View experiment as a game	0.552	0.316	1.744	0.040*
Doubts that the money would be given to the paired person	-0.482	0.297	-1.622	0.052*
Did Not View experiment as a game*Doubts that the money would be given to the Paired person	-0.641	0.317	-2.018	0.022*

-2*L.L. ratio = 14.841 with 2 degrees of freedom *one tailed¹⁰
Chi-Sq. p-value = 0.002

The probit model is significant with a probability of .002. Those individuals who doubted the description of the experimental design were significantly more likely to keep money. Not viewing the experiment as a game was positively related to leaving more. Mistrust in the experiment (interacting with the game variable) also led to lower levels of money being left.¹¹ In short, the subjects' doubts about the true nature of the experiment appear to fit the presented model of their behavior.¹²

The probit model also generates probabilities which act as predictors of whether a dictator would be assigned as a high, as opposed to low, leaver of money. Those probabilities ranged from .009 through .899. When these were used to determine the accuracy of the assignment of dictators to the two categories the results were as depicted in Table 5. The probit analysis discriminated, strongly between the two classes of dictators, assigning all but eight of the forty-one dictators to the appropriate category.

9/ Note that because the probit model in Table 4 contains single variables and an interaction term the variables had to be standardized so that they would be on the same scale. Otherwise the product of the interaction terms (each scored on a scale of 10) would be an order of magnitude greater than the single variable.

10/ The wording of the questions (see page 4), leads to the conjecture that the score on 'game' should relate positively to the amount given, while the product of game and belief that the money would be given to the paired other would be negatively related to the amount given. This being the case, in Table 4, we report the significance tests in terms of one tailed estimations.

11/ All the signs on the simple correlations between money left and the belief variables go in the conjectured directions.

12/ Forcing the data into a regression in which the dependent variable is the untransformed amount left and the same independent variables are used yields a significant regression ($F=5.95$, $p=.006$) which explains roughly 20 percent of the amount of money left.

Table 5: Prediction of Money Left		
	Predicted Low Givers	Predicted High Givers
Actual Low Givers	22	4
Actual High Givers	4	11

Discussion: Are the Responses Rationalizations?

Taken at face value, the data indicates that a significant proportion of the behavior in anonymous dictator experiments, traditionally interpreted as evidence of self-interested behavior, reflect doubts induced in the subject by the research design itself.

An alternative interpretation of the result presented is possible: responses on the questionnaire could be mere rationalizations for behavior after the fact. The beliefs may be induced *by* the behavior rather than reflecting the reasons *for* the behavior.

We can test this rationalization conjecture. In the One Room experiment all subjects, dictators *and* recipients were asked to fill out a questionnaire. If selfish dictators were rationalizing, their responses should be different than those who weren't. Specifically, we might expect them to express higher doubt than the recipients of monies do. These responses can be used to check directly for the plausibility of the rationalization hypothesis.

Table 6: Differences in Perceptions of the Experiments: Dictators vs Recipients				
Questions	Means of Responses			
	Dictators	Recipients	T-stat	Prob
Not Sure description was accurate	2.176	2.706	0.455	0.652
Not Sure that the money would be given to person with whom paired	3.235	3.294	0.060	0.952
Not Sure there were real people paired	4.353	3.118	1.105	0.277
Did Not View experiment as a game	6.000	5.438	.4754	0.638
N =	17	17		

The data in Table 6 shows that there are no significant differences between the expressed beliefs and orientations of dictators and recipients. Hence it would appear that the responses which explain behavior are not rationalizations.

Moreover, written comments in answer to an open ended question furnish evidence regarding these competing hypotheses. Many subjects reported doubt about the existence of others in Room B and indicated that such doubt impacted their decisions.¹³ Consider the following examples of responses:

13/ The tone of the questionnaire may have focused the subject's attention on the possibility of doubting the accuracy of the experiment's description. A more unfocused questionnaire may not have generated such a strong sample of comments reflecting doubts.

(Amount left: 0 Place: Canada) “Since I was not sure of the existence of person B, I was selfish and thought only of myself, disregarding how my actions may affect person B. (I enjoyed the way the experimenter did his best to completely randomize the survey.)”

(Amount left: 0 Place: Canada) “I really didn’t believe that someone was paired with me. When making my decision I thought about whether or not if I was indeed paired with someone - should I leave half for them and take half for me. Since however I concluded there probably wasn’t anyone in the other room, I took all of the money myself.”

(Amount left: 0 Place: MD) “didn’t believe there were people in room B.”

Even the One Room experiment generated doubt about the certainty of pairing as illustrated by these comments:

(Amount left: 0 Place MD One Room) I felt that we should’ve taken what we wanted because I wasn’t sure if we were paired with anyone.

(Amount left: 0 Place MD One Room) I doubt there was any pairing at all. I could see (not on purpose) that the # printed on the pink chit was the same as the # inside the envelope on the white chit. However, I would have taken all the money whether I knew there were no pairs or not.

On the other hand there were a number who left nothing who were unabashed about their beliefs and motivations, indicating no embarrassment and hence no apparent need to rationalize. For example:

(Amount left: 0; Place: MD) I took all of the money and all of the pieces of paper. I believed that there were “Room B” people because I met other people along the way who were going to a different room. I assumed that that was room B. I took everything because I thought they would never know if I didn’t give them any money, and therefore, I wouldn’t feel guilty. The amount of money made no difference.

(Amount left: 0; Place: MD) I figured that I was luckily placed in room A and got to make the decision so I should keep all the money. Especially since I desperately need money.

(Amount left: 0 Place: Manitoba) ... I therefore took all the money in order to maximize my benefit regardless of person in Room B. I also felt that anyone in my position would have done the same and if I was person in Room B I would not expect anything.

(Amount left: 0 Place: MD One Room) I took all the money. It’s human nature; it’s what anyone (I feel) would do if they were anonymous. It’s human nature and I feel this was an experiment testing human nature. If I would have gotten 20 blanks at the start, I would have expected to get 10 blanks at the end.

Thus, both quantitative and qualitative data seem to indicate that rationalization can be dismissed as a confounding factor.

Discussion: Treatment Effects

The careful reader will note that we have not discussed the effect of the one - room treatment, directly. In this section we examine how the treatment manifests itself in differences of beliefs (about the credibility of the protocol) and of behavior (how much was left in the envelopes).

Treatment effects on beliefs: Let us then consider what difference the treatment variable (one and two room designs) made on the beliefs of the subjects. This is best shown in a series of t-tests, see Table 7) where we compare the beliefs as a function of the 1 and 2 room design variable.

Table 7: Treatment Effects on Beliefs

<u>Questions</u>	<u>Means of Responses</u>		<u>T-test</u>	<u>Prob</u>
	<u>1 Room</u>	<u>2 Rooms</u>		
Did Not View experiment as a game	6.00	5.21	.718	.477
Not Sure there were real people paired	4.56	5.36	.702	.486
Not Sure description was accurate	2.25	1.75	.539	.296
Not Sure that the money would be given to person with whom paired	2.88	4.75	1.81	.038*
N	16	28		
*one tailed				

In general, the presence of others in one room increases (but not significantly) the perception of the experiment as a game. Although most of the scores on the belief variables are higher in the 2 room treatment, only in their belief that the money would be left to the person with whom they were paired, did the treatment variable make a statistically significant difference. As will be seen below, those small differences in belief are reflected by small differences in behavior.

Treatment effects on behavior: The amount left varied between the two treatments. As conjectured, when all the individuals were in one room, they left more in the envelopes than when the recipients were unseen, and in another room. One way of seeing this is by comparing the means of the amounts left by the dictators in the two treatments. On the One Room experiment the mean amount left was \$2.47 (n=17) compared with \$1.82 (n=39) in the Two Room experiments.¹⁴ However, a t-test is not viable given that the data is bi-modal.

Another way of seeing the difference would be to consider the difference in the behavior as recoded for use in the Probit analysis. There we collapsed the categories of giving so that those who left less than \$2 were considered low givers, and those who gave more than \$3 were high givers. To get an idea of the difference the treatment made, we compare the pattern of high and low giving among the subjects of the 1 and two room experiments in the U.S. This is shown graphically in Figure 3 however, a chi-square test on this data does not show a significant difference in behavior: Pearson Chi-square = 1.26; df = 1; p = .26.

14/ Here, we again, leave out the two outliers who left everything in the envelope but include those that did not answer the 'game' question.

Conclusions and Implications

Our experimental results lead us to several conclusions both substantive and methodological. In turn, those conclusions have implications for policy. Substantively, the evidence for the dominance of self-interest, as reported in a number of previous dictator experiments, appears less solid than believed. Consistent with the findings of Eckel and Grossman (1996) other-regarding behavior seems to be highly sensitive to context. The stylized context of the dictator experiments may induce behavior which, although interpretable as evidence for self-interested behavior, may be motivated by a different understanding of the experiment. It appears that removing both experimenter effects and all social context from an experimental environment, introduces new types of error.

Anonymity and privacy seem to be purchased, not only at a price of decreased motivation to leave money because of a lack of context (and social distance). The design also appears to induce doubt. Doubt affects behavior so that the resultant observations are difficult to interpret on the axis of the self-interest / other-regarding dimension. Additionally, subjects in an experiment may view it as a game. This leads to further difficulty in interpreting their actions appropriately. Most games give players not only license, but an actual imperative to win. Accordingly, game-motivated behavior may be inappropriately interpreted as self-interested behavior. In sum, behavior is context dependent in a number of subtle ways.

Let us expand upon this relatively terse statement of our conclusions. More generally, when an experimenter attempts to “clean” an experiment so that the subject’s anonymity is preserved, and the subject neither interacts substantially with the experimenter nor has contact with others, a window for doubt is opened. The separation of the subject from the consequences of her choices presents the opportunity to doubt the effects of those actions. And doubt will systematically alter the choices.

The one room experiment was an attempt to remove doubt from subjects’ minds regarding the true nature of the pairing. Contrary to the hypothesis, most measures of subjects’ uncertainties were not significantly different as a result of the change in the number of rooms. Indeed, only doubt that the money left in the envelope would be given to the paired other was significantly reduced in the 1-room experiments. Humans exhibit different subjective understandings of the “same reality.” There is no way to guarantee that subjects believe the true nature of the experimental design even when the experimenter is at great pains to make it transparent. The divergence between the expected and actual results of those two experimental manipulations point to the difficulty of interpreting the effect of any given manipulation on any single individual subject.

Even though *no* experimental context can be made doubt free, some environments are more evocative of doubt than others. A good example of a design which seems to have reduced doubts considerably is the experiment in which Grossman and Eckel (1994) used a charity as a recipient. Those subjects, all in one room, probably did not doubt the existence of the Red Cross, nor are

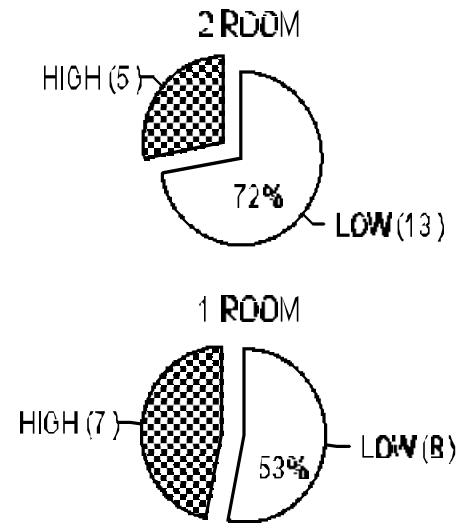


Figure 3: Proportion of High and Low Givers in 1 and 2 room experiments in the US

they likely to believe that the experimenters would renege on a commitment to contribute to a legitimate charity. Yet there appears to be a tension between anonymity and the maintenance of subjects' credulity. And this jeopardizes the ease of interpreting experimental results. Hence, anonymity may be purchasable only at a price. In designing and interpreting experimental results, experimenters may have to identify and take into account the factors which affect the credibility of the design.

The successive refinements of the dictator experimental protocol were designed to remove experimenter effects. They led to results which seemed to indicate a broader prevalence of self-interest. Yet a significant residuum of other-regarding behavior persisted. When analyzed as a body, the dictator experiments seemed to indicate that the mix of self-interest and seemingly other-regarding behavior depended upon the structure of the decision environment. Hoffman, McCabe and Smith (1996) identify social distance, as possibly explaining the degree of other-regarding behavior exhibited by subjects in experiments.

Our subjects in two room dictatorship experiments behave much like other experimental subjects. Of course, the move to a one room design affects both social distance and doubts. Yet when all subjects are placed in a single room, many of their doubts about the veracity of the experimental design persist and continue to explain their behavior. One would have expected a decrease in "social distance" to have altered the behavior, yet the effect on the model explaining behavior appears minimal. By asking questions, post hoc, it may be possible to gain insight into which aspects of their environment and their perceptions are responsible for their actions.

For most economists it may have seemed clear that the world is largely explicable by self-interested behavior: a view more plausible when economists restricted their gaze to the world of private goods and markets. As the scope of economic analysis widened to the fields of public goods, social choice, games and coalitional issues, the empirical accuracy of their assumptions became more questionable. More complex motivations and hence more complex behavioral assumptions may be required to explain behavior in more interactive social situations.

From a policy perspective, it follows that those who seek to construct political or economic institutions ought to be sensitive to the behavioral cues in their institutions. In the complex non-market worlds of social interaction, and more specifically in politics, assumptions of self-interest are likely to be too simplistic to generate uniformly accurate models. The degree of self-interest is likely to vary as a function of institutional structure. If we are right, it will be important to take these changes in motivation into account in the designing of our political and social institutions. The effects on other-regarding behavior should also figure in the design of certain public policies. For example, market enhancing and market expanding policies, which have recently gained favor, could imply considerable changes in the amount of self-interested behavior which develops in social environments.

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APPENDIX: EXPERIMENTAL PROTOCOLS AND SUPPLEMENTARY DOCUMENTATION

Human Subjects Consent Form and Clearance

CONSENT FORM FOR PARTICIPATION IN EXPERIMENT on INDIVIDUAL CHOICE DYNAMICS

I have volunteered to participate in the research program being conducted by professor Oppenheimer of the Government and Politics Department at the University of Maryland, College Park. The purpose of the experiment is to understand individual choice dynamics.

I understand that I am free to withdraw from participation at any time but if for some reason, over the course of the experiment, I cannot continue, I am asked to contact the experimenter to receive permission to leave. If I do leave, I may forfeit the payment that I have just received. I understand that I am not to speak to others or to make comments, except to ask questions about the procedure of the experiment. The experiment will last about one hour. I understand that I am not to discuss the procedures of this experiment with others outside this room for the next few weeks. If you are unable to comply with these rules, we ask that you leave now.

In all publication and presentation of the information collected in this study, my name will not be used, although there will, perhaps, be reporting of details of unidentified subjects' behavior.

I understand that the experiment is not designed to help me personally, but that the investigator hopes to learn more about committee dynamics. I understand that I am free to ask questions or to withdraw from participation at any time without penalty.

The principal investigator in this experiment is: Professor Oppenheimer Department of Government and Politics: 405 4136.

_____ (subject's signature)

_____ (date)

Experimental Protocols for the "Pilot" and "Type 2" Experiment with Questionnaire

Instructions -- Room A: You have been asked to participate in a social science experiment. For your participation today we have paid you \$5 in cash. You may earn an additional amount of money, which will also be paid to you in cash at the end of the experiment.

In this experiment each of you will be paired with a different person who is in another room. You will not be told who these people are either during or after the experiment. This is room A.

You will notice that there are other people in the same room with you who are also participating in the experiment. You will not be paired with any of these people.

One of the persons in room A will be chosen to be the monitor for today's experiment. The monitor will be in charge of the envelopes as explained below. In addition the monitor will verify that the instructions have been followed as they appear here.

The experiment is conducted as follows: There are a set of numbered envelopes, one for each person in this room, number side down in a box at the back of the room. One is "numbered" M. All the others each contain a colored, folded chit with the same number as the envelope. The

person who pulls the M-labelled envelope will be assigned the role of monitor. 2 envelopes, and the envelope marked with an M, contain 20 blank slips of paper. All of the other envelopes contain 10 one dollar bills and 10 blank slips of paper. Each person will select an envelope, and keep it unopened in front of them. The monitor will call persons, by pointing one person at a time to the private booths at the back of the room. The person who was called will then go to one of the booths, in the back of the room. The person will then open the envelope privately inside the booth.

Each person must decide how many dollar bills (if any) and how many slips of paper to leave in the envelope. The number of dollars bills plus the number of slips of paper *must add up to 10*. The person then **takes the colored, folded, and numbered chit, the remaining dollar bills, and the remaining slips of paper.**

Examples: (1) Leave \$2 and 8 slips in the envelope, pocket the chit, \$8, and 2 slips; (2) Leave \$9 and 1 slip in the envelope, pocket the chit, \$1, and 9 slips. These are examples only, the actual decision is up to each person. Also note that ***no one else, not even the experimenter***, will know the personal decisions of the individuals in room A.

Once you have made your decision you must seal your envelope inside the booth and **then show it and your (folded) chit - do not show the number - to the monitor, and then place the envelope in the box at the front marked “Return envelopes.”** The monitor will only check that you have your chit and that your envelope has been properly sealed. You may then leave the room. In the hall, outside the room, there is another assistant. He will ask you to show him **your folded chit - not the number** - and sign a receipt form, saying that you “received the \$5 appearance fee, and an envelope containing *either 20 blanks or 10 blanks and 10 dollar bills*.” He will ask you to put the chit in an envelope and deposit the envelope in a box.

After all fourteen envelopes have been returned the monitor will take the box from inside this room to room B. There are as many people in room B as there are numbered subjects in this room. Each of these persons has been paid \$5 to participate and has been assigned a number. The monitor will be given a list of names of people in room B. The monitor will choose an envelope from the box, and call out the number of the envelope. The individual paired with the called number will then come to the front and watch the envelope being opened and then observe as the monitor records the contents of the envelope. That person will then receive the contents of the envelope, sign for them, and is then free to leave. The monitor will continue until all the envelopes have been handed out and everyone else has left the room. The experiment is then over.

Instructions -- Room B: You have been asked to participate in a social science experiment. For your participation today we have paid you \$5 in cash. You may earn an additional amount of money, which will also be paid to you in cash at the end of the experiment.

In this experiment each of you will be paired by number with a different person who is in another room. You will not be told who these people are either during or after the experiment. This is room B.

Your number is ____.

You will notice that there are other people in the same room with you who are also participating in the experiment. You will not be paired with any of these people.

One of the persons in room A will be chosen to be the monitor for today’s experiment. The monitor will be in charge of the envelopes as explained below. In addition the monitor will verify that the instructions have been followed as they appear here.

The experiment is conducted as follows: There are a set of numbered envelopes, one for each person in this room, numbered side down in a box at the back of Room A. One is “numbered” M.

All the others each contain a colored, folded chit with the same number as the envelope. The person who pulls the M-labelled envelope will be assigned the role of monitor. 2 envelopes, and the envelope marked with an M, contain 20 blank slips of paper. All of the other envelopes contain 10 one dollar bills and 10 blank slips of paper. Each person in Room A will select an envelope, and keep it unopened in front of them. The monitor will call persons, by pointing one person at a time to the private booths at the back of the room. The person who was called will then go to one of the booths, in the back of the room. The person will then open the envelope privately inside the booth.

Each person in room A must there decide how many dollar bills (if any) and how many slips of paper to leave in the envelope. The number of dollars bills plus the number of slips of paper must add up to 10. The person then takes and pockets, the numbered chit, the remaining dollar bills, and the remaining slips of paper.

Example: (1) The individual could leave \$2 and 8 slips in the envelope, pocket the chit, \$8, and 2 slips; or (2) leave \$9 and 1 slip in the envelope, pocket the chit, \$1, and 9 slips. These are examples only, the actual decision is up to each person. Also note that ***no one else, not even the experimenter***, will know the personal decisions of people in room A.

Once each person in room A has made his or her decision, he or she will seal the envelope inside the booth. The individual must then **show it and the (folded) chit - not the number - to the monitor, and then place the envelope in the box at the front marked “Return envelopes.”** The monitor will only check that the person has their chit and that the envelope has been properly sealed. The individual may then leave the room. In the hall, outside the room, there is another assistant. He will ask the subject to sign a receipt form, saying that he or she “received the \$5 appearance fee, and an envelope containing *either 20 blanks or 10 blanks and 10 dollar bills.*” He will ask for the chit to be put in an envelope and deposited in a box.

After all envelopes have been returned the monitor will take the box with the envelopes from room A to this room, room B. Here each of you has been paid \$5 to participate and has been assigned a number. The monitor will choose an envelope from the box, and call out the number on the envelope. The individual with that number in this room will come to the front and watch their envelope being opened. The person will observe as the monitor records the contents of the envelope. That person will then receive the contents of the envelope, sign for them, and is then free to leave. The monitor will continue until all the envelopes have been handed out and everyone else has left the room. The experiment is then over.

Hall Monitor Instructions: **1.** Have chit shown back side up and placed in an envelope.

2. Hand out questionnaire with the envelope and ask to have it filled out, folded and put in envelope; have subject seal envelope and put in box in hall, and then leave.

Questionnaire: Instructions: Circle the number which best represents the strength of your agreement or disagreement with the item (0 is strong agreement, 10 is strong disagreement). Please also answer the last question about your reasons for doing what you did and add any comments you think would help us understand your decision. The questions were then followed by an “Answer space” both of which are described on page 4. The questions from the One Room experiment (in the cases when they were modified) are located beneath the original questions designated by an “*.”

after the question number. The respondents were asked to express their degree of agreement on the following scale:

Agree Strongly 0 1 2 3 4 5 6 7 8 9 10 Disagree Strongly

1. I trusted that the experiment was being conducted in the way that it was described to me.
2. I am sure that there really are people in Room B.
- 2* I am sure that there really was a person paired with me.
3. I am sure that the money I left in the envelope will be given to the person in Room B with whom I have been paired.
- 3* I was sure that the money I left in the envelope was going to be given to the person with whom I had been paired
4. Uncertainty about the existence of people in Room B affected the amount of money I left in the envelope.
- 4* Uncertainty about the existence of the person with whom I was paired affected the amount of money I left in the envelope
5. I would have left more money were I sure that the money left in the envelope would be given to the person in Room B with whom I had been paired.
- 5* I would have left more money were I sure that the money left in the envelope would be given to the person with whom I had been paired.
6. I viewed the experiment as a sort of “game” in which I was a player trying to win.
7. Please tell us why you made the decision you did about what you left in the envelope. (Feel free to write in any other comments you might like to make about the experiment.)