All-or-Nothing Dictator Games: A Field Experiment

JEL Keywords: A13, D64, C72, C93, H41

The dictator game has become well known for its results violating predictions based on ‘rational choice’ models of human behavior with orthodox assumptions on self-interest (Colin F. Camerer, 2003). Prosocial allocations in dictator games seem to suggest that there is some altruism in ‘human nature’. However, the methodology used in experimental games has been severely criticized. Experimental games create abstract decision situations (Charlan J. Nemeth, 1972; Dean G. Pruitt & M.J. Kimmel, 1977), easily generate experimenter demands (Catherine C. Eckel & Philip J. Grossman, 1996; Elizabeth Hoffman, Kevin McCabe & Vernon Smith, 1996), make unrealistic assumptions on asset legitimacy (John A. List & Todd L. Cherry, 2000), and lack sufficient control for heterogeneity of the sample across treatments (Glenn W. Harrison & Laurie T. Johnson, 2004). The present study addresses several of these criticisms. I had a large, representative sample of the Dutch population (n=1,964) play an ‘All-or-Nothing’ version of the dictator game, with earnings varying from €6 to €11 ($8 to $13.50, exchange rate April 2004) obtained by participating in a survey. The money offered by dictators benefited charities. There was no experimenter present, and choices were made anonymously. The results come close to the prediction of orthodox rational choice models assuming ‘utility is own money’: only 5% of the sample donated money. Donations increase with age, education, generalized social trust, and a measure of prosocial value orientation, the latter effect increasing with income.
I. Experimental Design

a. Participants

The participants in this study were 1,964 respondents of the first wave of the Giving in the Netherlands Panel Survey (GINPS), which were collected in May 2002. The survey was a Computer Assisted Self Interview (CASI) completed by a random sample of 1,707 respondents from the Dutch population and an additional sample of 257 respondents from Protestant denominations (details on design, sampling and questionnaires are given in Theo N.M. Schuyt, 2003:225-8). Respondents were drawn randomly from a pool of 72,000 respondents who regularly participate in surveys through the Internet. Persons in this pool were originally drawn randomly from the population register, and were invited in a letter to participate in surveys. Prospective participants who did not possess a suitable personal computer with internet connection were provided with one. Data for the present study were collected through the internet. Because there was no interviewer present when the respondents completed the GINPS-questionnaire and decided about donating their earnings, experimenter demands are unlikely. In drawing the sample, special care was taken to avoid sample bias with regard to Internet use by stratification with regard to age, gender, and geographic region.

b. Procedure

By participating in the GINPS, respondents earned a reward, proportional to the amount of time it took them to complete the survey. The reward was given in the form of ‘points’, which corresponded to an amount in Euros. The monetary value of the ‘points’ earned was displayed after the respondents completed the survey. Then, the respondents were given the following choice (henceforth called the ‘donation decision’) between two alternative options. The first option consisted of an exchange of the points into Air Miles or vouchers for a well-known chain of shops for domestic articles, music and video products. The second
option consisted of an exchange of earnings into a donation to one of three charitable causes: 'Médecins Sans Frontières' (MSF; in the US known as Doctors Without Borders), providing emergency health care in developing countries), the Aids Fund (fighting HIV/AIDS, mainly through research) or the Queen Wilhelmina Fund (fighting cancer, mainly through medical research). The two options constitute an ‘All-or-Nothing’ version dictator game, with a price of giving or multiplier of 1 (James Andreoni & John Miller, 2002) and with only two options. Respondents could either give their earnings away completely (offering 100% to the other, in this case a charity chosen by the dictator), or keep their earnings for themselves (offering 0%). Donations may have been constrained by the fact that only one of three charities could be chosen. However, the three charities are well known in the Netherlands. In terms of fundraising income, the Queen Wilhelmina Fund is one of the largest charities in the country (Central Bureau of Fundraising, 2003). In addition, two of the three charities are active in the medical research sector, which is a very common cause for donations in the Netherlands because many health charities organize door-to-door collections with high response rates (Schuyt, 2003). In the GINPS, 69.4% of the respondents reported donations by their household to health causes in the past year.

Donation decisions were automatically stored in a secure electronic database on the Internet, as were the responses in the GINPS-questionnaire. The complete survey session was held without interference by a human interviewer or experimenter. After the donation decision was made, an automatic e-mail message was sent to the respondents confirming their decision (e.g., ‘We have transferred an amount of € xxx to your bank account number xxx’). This procedure bears similarity to a single blind-procedure in ordinary dictator games. It is not double blind because respondents may believe that their responses and donation decisions can be traced by data analysts by matching the data obtained in the survey session with the e-mail address used for soliciting participation.
Completing the entire GINPS-questionnaire took the respondents about 35 minutes. On average, the respondents earned 57.2 points, which corresponded to a value of €9 (which is about $11.25). Thus, the average donation decision was to give away €9 to a charity or to keep the money. This decision parallels the offer of 100% of the conventional $10 endowment in an ordinary dictator game. Because some respondents took more time to complete the survey than others, the amount of money involved in the donation decision differs between participants. The number of points earned ranged from 40 to 69 (€6 to €11). The number of points earned by completing the survey served as a measure of the stakes in the donation decision. The stakes-measure is far from perfect because the variance is not very large and because it varies systematically with characteristics of the respondents. Older and lower educated persons earned more money for completing the survey, probably because they were slower in answering questions. In addition, respondents who reported donations to a higher number of charitable causes and volunteers also needed more time to complete the survey because they filled out more extensive questionnaires on their giving and volunteering behavior. Therefore, age, education, donations and volunteering behaviors in the past year are included as control variables. Partialling out these effects, it can be tested whether a higher reward for participation – and hence a stronger temptation to keep the money – reduces donations.

Given the design of the present study, what would be a reasonable expectation of the proportion of donations? Results of previous studies using dictator games with samples of students show a wide variety of outcomes (Camerer, 2003, pp. 57-58). The present study differs from previous studies in its all-or-nothing format. This will decrease generosity.¹ In other respects the present study combines aspects of studies by Eckel & Grossman (1996) and Todd L. Cherry, Peter Frykblom & Jason F. Shogren (2002). First, the money that was to be allocated was not an endowment given to the participants, but earned. Cherry, Frykblom &
Shogren (2002) showed that ‘legitimising’ wealth by giving rewards to dictators in proportion to the number of questions answered correctly in a quiz strongly decreases generosity. List & Cherry (2000) showed that games with earnings instead of endowments decrease the generosity of offers in an ultimatum game. Second, others could not observe donations. The donation decision was made through the Internet, without the presence of an experimenter. Participants in the survey were assured that their responses to the survey were kept confidential. The participants did not receive a ‘Thank you’ notice from the charities. Eckel & Grossman (1996) showed that anonymity decreases allocations to the other in a dictator game. However, the procedure of the present study was not double blind: participants may believe that their decisions could be traced afterwards. Third, the recipient in the present study was not an anonymous, randomly chosen other person, but a charity chosen by the participants. Eckel & Grossman (1996) compared allocations in an ordinary dictator game with a game benefiting the Red Cross and found that generosity was much higher in the latter game, with 10% of the participants donating everything. These results suggest that identifying (allegedly deserving) charities as recipients increase generosity. A recent study (Small & Loewenstein, 2003) suggests that the mere identification of beneficiaries increases giving.

c. Additional measures

Because the respondents made donation decisions after they had completed an extensive survey questionnaire on charitable giving, volunteering and socio-demographic characteristics, donation decisions can be related to previous philanthropic behavior and relevant factors in decisions about donations. While the present study did not contain any manipulations, it is clear that conducting experiments among survey respondents offers many advantages for researchers. Large sample sizes create opportunities for statistical control over heterogeneity across treatments and for identification of predictors of altruistic behavior.
Included in the present study are the stakes-measure discussed above and measures for gender (female=1), age (in years), the level of education (holding a university degree=1), gross yearly household income (midpoint values were used of 24 categories, ranging from €2,000 to €300,000; higher incomes were truncated), and the number of church visits per year. Two variables measuring philanthropic behavior in the past are also included in the analysis because they are correlated with the amount earned by completing the survey, because donors and volunteers had to fill out more extensive questionnaires: the number of different types of charitable causes supported in the past year, and a dummy variable for having served as a volunteer in the past year. In a second model, two variables measuring favourable attitudes with regard to philanthropy are also included. Generalized social trust is a dummy variable (above median=1) for two statements about human nature (‘You can’t be too careful in dealing with other people’ and ‘Most people can be trusted’, ranging from 1 – disagree completely – to 5 – completely agree). A dummy variable for trust is included instead of a mean score because the effect of trust on charitable giving is non-linear (René Bekkers, 2003). Prosocial value orientation is a commonly used measure in social psychology reflecting the concern for joint outcomes and equality in social dilemmas (Paul A.M. van Lange, 1999). The measure is based on self-other allocations of hypothetical endowments in a series of nine single-shot ‘decomposed games’ (Paul A.M. van Lange et al., 1997). The games are hypothetical dictator games without an actual recipient and with varying stakes. In each of these nine games, three options are available: an equal split (the ‘prosocial’ allocation), an ‘individualistic’ allocation maximizing own outcomes, and a ‘competitive’ allocation maximizing the difference between pay-offs for self and other. I used the number of prosocial allocations in the nine hypothetical games as a measure of prosocial value orientation. Previous research suggests that hypothetical choices are to some extent predictive of allocations in real dictator games (Neil Buckley et al., 2001).
II. Results

An overwhelming majority of 1,852 subjects (94.3%) kept the reward earned by participation in the GINPS for themselves. Only 112 subjects (5.70%) decided to give away the reward. The Queen Wilhelmina Cancer Fund received 63 donations (3.21%); the Médecins Sans Frontières received 39 donations (1.99%) and the Aids Fund received 10 donations (0.51%). This result lies between the proportion of dictators giving more than half of their endowment (8.3%) and the proportion giving away their complete endowment (2.6%) in previous research using ordinary dictator games (Camerer, 2003). However, donations were considerably less than the 10% reported by Eckel & Grossman (1996) with the Red Cross identified as the sole recipient.

The observation of only 5.7% donations can be explained in a number of ways. Asset legitimacy, anonymity of decisions and sampling differences are probably the main reasons for the difference. First, the present study used earnings instead of the customary windfall endowment. Giving away at least a portion of an unexpected windfall is a relatively easy thing to do. It is not surprising that giving away the complete amount earned through an effort made before is less often observed. Second, donation decisions were made anonymously. The participants could not receive approval for leaving at least some portion of earnings to a charity from an experimenter or the charity. Third, the multivariate logit analysis (see table 1) indicates that the use of a random sample of the population rather than a convenience sample of university students decreases giving. In line with studies of self-reported donations (Bekkers, 2004a), those holding a university degree are more than twice as likely to make donations than those with lower levels of education, controlling for income (predicted probabilities of donation 4.89% and 10.13%). The latter proportion is the same as in Eckel & Grossman’s study (1996) with the Red Cross as a recipient, in which only university students participated. This finding reinforces the concern that conclusions drawn in experimental
games using students as participants are sensitive to sample composition (Harrison & Johnson, 2004) and should not be generalized beyond the original subject pool. The observation of only 5.7% donations comes close to the approximately 5% response rate that Dutch charities report when using direct mail on a random database of addresses.³

The probit regression analysis revealed additional interesting findings. Differences in stakes do not influence donation decisions.⁴ The increase of generosity with age is in line with previous research on charitable giving in the Netherlands (Bekkers, 2003, 2004b). The lower generosity of women compared to men is in contrast with previous studies of the role of gender in ultimatum and dictator games played with endowed wealth, which showed no differences or more generosity by women (Eckel & Grossman, 1998).⁵ The second model, adding trust and social value orientation as motives for donations and an interaction of income with social value orientation, increase the proportion of explained variance (likelihood ratio test of 26.94 (df=3), p<.000). As in previous research, generosity increases with generalized social trust (Bekkers, 2003c) and prosocial value orientation (Bekkers, 2004b; Buckley et al., 2001; Theo Offerman, Joep Sonnemans & Arthur Schram, 1996).⁶ Prosocial value orientations may reflect altruistic concerns, but also a concern for fairness or joint outcomes (Van Lange, 1999). The effect of social value orientation increased with income, suggesting that prosocial motivation for donations to health charities is a luxury good.⁷ In the final model, volunteering behavior and the number of charities supported in the past year are not related to the donation of points earned. This is not surprising because the main factors influencing giving and volunteering were included in the analysis.
III. Conclusion

Dictator games and charitable giving have been studied by economists interested in the role of altruism in human behavior (James Andreoni, 1990; Eckel & Grossman, 1996; David C. Ribar & Mark O. Wilhelm, 2002). The objective of the present paper was not to show that it is possible to create a decision situation generating low offers, but to study generosity in a situation that is closer to ‘real life’ than the common dictator game experiment. The present field study of donations among a random sample of the Dutch population reinforces conclusions from previous research that altruistic behavior is rather uncommon when allocations are made of earned wealth (Cherry, Frykblom & Shogren, 2002). Ninety four percent of the allocations of earned wealth in the present study are self-interested. This result is striking because the procedure was not double blind and the recipient was an (allegedly ‘deserving’) charity to be chosen by participants. Still, only few donations were made. Perhaps violations of zero-contribution predictions based on rational choice models assuming ‘utility is own money’, which are frequently observed in lab experiments using samples of university students playing games with endowed wealth, say more about the methodology used to test such models than about the theory being tested.
References


_____. “And Who is Your Neighbor?”. Working paper, Department of Sociology, Utrecht University, April 2004.


_____. “Are Women Less Selfish than Men? Evidence from Dictator Experiments”.


Hoffman, Elizabeth; McCabe, Kevin; and Smith, Vernon L. “Social Distance and Other-Regarding Behavior in Dictator Games”. American Economic Review, June 1996, 86 (3), pp. 653-60.


Notes

1. According to Camerer (2003), the proportion of participants giving away nothing at all from their endowment varies from 0 to 93%, with an average of 33.9%; the proportion giving away everything varies from 0 to 18%, with an average of 2.6%. If it is assumed that in our charity game the participants choose the option that comes closest to their ‘real’ preference, donations would be observed for respondents who would have given away more than half of their endowment in an ordinary dictator game. With this approach, the results of previous studies predict donations by 7.4% of the participants. Calculations were made as follows: in table 2.4 of Camerer (2003, 57-8), the proportions of participants allocating 0%, 100% or >50% were summed and divided by the number of studies that offered the possibility of allocating these proportions. 29 studies offered the possibility of allocating 0%, and 25 studies offered the possibility of allocating >50% and 100%.

2. The effect of a linear education variable (8 categories ranging from primary school to PhD degree) is .200 (.054), p<.000. In contrast to another field experiment (Meier & Frey, 2003), respondents who were trained in economics were just as generous as other respondents (.125 (.261), p<0.633). As in previous research using self-report data (Bekkers, 2003), the effect of trust is clearly non-linear. The linear effect of trust is .051 (.124), p<.682.

3. Analyses excluding the oversampling of Protestants revealed virtually the same results.

4. Because it can be argued that the effective stakes depend on household income, an analysis was run using the ratio between earnings and household income instead of stakes. This analysis produced very similar results. Because stakes varied only from €6 to €11 ($8 to
$13.50) they were probably not large enough to affect donation decisions. It seems unlikely that earnings of €100 would be donated in the same proportion as earnings of €9. Nevertheless, Cherry, Frykblom & Shogren (2002), report a non-significant difference between 95% and 97% zero-offers in $10 and $40 double blind dictator games.

5. Additional analyses show that gender differences are not due to differences in decision making responsibilities within households, as could be argued from previous research (Andreoni, Brown & Rischall, 2003). Women more often indicated that they were solely responsible for decisions about donations than men (28.3% vs 15.6%). Including a dummy variable for responsibility decreased the gender difference only slightly (to -.400, p<.053). Among college and university graduates, the gender difference was even larger (donations by 12.72% of males vs 6.77% of females, Chi Square (df=1) 2.92, p<.087 than among those with lower levels of education (donations by 5.68% of males vs 4.19% among females, Chi Square (df=1) 2.00, p<.158). Andreoni & Vesterlund (2001) showed that males are more generous than females when the price of altruism is high; perhaps a donation of earned wealth is viewed as a ‘high cost’ donation.

6. The absence of relations with household income and church attendance seems to stand in contrast to previous research on charitable giving in the Netherlands (Bekkers, 2003, 2004b). However, additional analyses of self-reported annual donations to health charities in the GINPS showed they are less sensitive to income than donations to other types of charities. Income showed only a marginally significant weakly positive relation with the amount donated to health charities (effect of .095 (se=.056), p<.090 in a Heckman Two Stage regression).
7. Note that in the decomposed games almost half of the respondents (49.03%) preferred the equal split of a hypothetical endowment in 6 or more out of 9 games, which is an often used criterion of consistency (Van Lange et al., 1997). Females preferred the equal split significantly more often than men (51.33% and 46.57%, Chi Square (df=1) 4.44, p<.035). Separate analyses of the effect of social value orientations for incomes below and above the median showed a non-significant effect in the former group and a significantly positive effect in the latter (effects of .031 (.033), p<.333 and .135 (.045), p<.003, respectively). The analysis of annual donations to health causes also showed a significantly positive interaction of income and prosocial value orientation (.024 (.009), p<.010). However, donations to health are an exception. Overall donations are not more strongly motivated by prosocial values as income increases (Bekkers, 2004a).
Table 1. Probit regression analysis of observed donations (source: GINPS, n=1,964)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff. (se)</td>
<td>Marginal effect (se)</td>
<td>Coeff. (se)</td>
<td>Marginal effect (se)</td>
</tr>
<tr>
<td>Female (0-1)</td>
<td>-.182 (.095)</td>
<td>(*) -1.94% (1.02)</td>
<td>-.184 (.097)</td>
<td>(*) -1.80% (0.96)</td>
</tr>
<tr>
<td>Age</td>
<td>.007 (.003)</td>
<td>* 0.06% (0.03)</td>
<td>.006 (.003)</td>
<td>(*) 0.06% (0.03)</td>
</tr>
<tr>
<td>University degree</td>
<td>.391 (.118)</td>
<td>*** 5.13% (1.86)</td>
<td>.344 (.121)</td>
<td>** 4.06% (1.70)</td>
</tr>
<tr>
<td>Gross household income</td>
<td>.006 (.003)</td>
<td>(*) 0.06% (0.04)</td>
<td>-.009 (.006)</td>
<td>-0.09% (0.06)</td>
</tr>
<tr>
<td>Church attendance</td>
<td>-.002 (.002)</td>
<td>-0.02% (0.03)</td>
<td>-.003 (.003)</td>
<td>-0.02% (0.03)</td>
</tr>
<tr>
<td>Stakes</td>
<td>.001 (.010)</td>
<td>0.01% (0.11)</td>
<td>-.003 (.011)</td>
<td>-0.03% (0.10)</td>
</tr>
<tr>
<td>Volunteered in past year</td>
<td>.097 (.100)</td>
<td>10.31% (10.73)</td>
<td>.097 (.103)</td>
<td>9.43% (10.08)</td>
</tr>
<tr>
<td>Number of charities supported</td>
<td>.055 (.032)</td>
<td>(*) 5.85% (3.31)</td>
<td>.033 (.033)</td>
<td>3.15% (3.16)</td>
</tr>
<tr>
<td>Prosocial value orientation</td>
<td></td>
<td></td>
<td>.024 (.013)</td>
<td>(*) 2.29% (1.24)</td>
</tr>
<tr>
<td>Prosocial value orientation * income</td>
<td>.050 (.015)</td>
<td>*** 4.80% (1.34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalized social trust (0-1)</td>
<td>.169 (.100)</td>
<td>(*) 1.65% (0.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-2.296 (.564)</td>
<td>***</td>
<td>-1.845 (.598)</td>
<td>**</td>
</tr>
<tr>
<td>Table: Model Comparison</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pseudo R-Square</strong></td>
<td>.0367</td>
<td>.0681</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Log Likelihood</strong></td>
<td>-413.7552</td>
<td>-400.2844</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Likelihood Ratio Chi Square (df)</strong></td>
<td>31.57</td>
<td>58.51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(0-1) indicates variable is dichotomous

*** p<0.001; ** p<0.01; * p<0.05; (*) p<0.10 (two-tailed)