

Giving to Africa and Perceptions of Poverty

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ABSTRACT

We conduct two simple experiments in which student participants are invited to give some of the money that they have earned to an international development charity for use in one of two African countries. In the between-groups experiment, participants are given the opportunity to donate to one country only. They are matched randomly with a country, and are given information about why that country might be poor; the information varies between the two treatments. In the within-group experiment, participants are given the opportunity to donate to either or both of the countries, and are given all of the information. Analysis of the results indicates that the effect of the difference in experimental design on the decisions made depends partly on observable participant characteristics. The results can be interpreted in terms of a model incorporating self-image.

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1. Introduction

What motivates people to give money to international development charities? Does it matter to potential donors *why* the recipient country is poor? To what extent does the level of charity depend on individual characteristics, such as gender, interest in world affairs, or participation in social group activities? This paper seeks to analyze all of these questions using a set of Dictator Game experiments.

Several existing papers report the results of experiments designed to explore the effect on charitable donations of information about the charity. In these experiments, different information sets are used as different treatments. This paper reports results from a similar set of experiments using a group of student participants from a New Zealand university. However, we focus on the factors that might explain variations in the way that different participants respond to the treatment. We also explore how variation in the number of choices that participants are offered affects their behavior. The next section puts our experiments in context by reviewing two areas of the literature: the effect of information about the recipient on donations, and the effect of participant characteristics on transfers in experimental games. We then discuss our experimental design, and the theories that might be used to interpret observed experimental behavior, before presenting our results.

2. Literature Review

2.1. Charitable donations and information about the recipients in Dictator Games

Our experiment is a version of the Dictator Game, in which participants are given a sum of money and then have the opportunity to transfer some proportion of the money to someone else. In our case, the recipient is a charity rather than another experimental participant. This type of game has been used to study a number of aspects of charitable giving, including the impact on donations of subsidies (Eckel

and Grossman, 2003; Davis, 2006) and taxes (Crumpler and Grossman, 2008). The studies most relevant to our own are those focussing on information provided about the recipient. Three existing Dictator Game studies – Brañas-Garza (2006), Fong and Luttmer (2009), and Small *et al.* (2007) – use treatments similar to ours, although without our focus on the effect of observable participant characteristics, or the effect of different explanations for why the recipient country is poor.¹

Small *et al.* (2007) focus on motives for giving money to an international development charity operating in Africa. Their Dictator Game is used to explore whether people give more when presented with personal information about an ‘identifiable victim’, rather than statistical information about the magnitude of the problem of poverty in Africa. Having been paid \$5 for completing a survey, participants were handed a letter containing information about poverty in Africa, and inviting them to donate part of their \$5 to Save the Children. In the first treatment, participants were given statistical information about the problems of starvation in Africa, and told that this was caused by food shortages resulting from a lack of rainfall. In a second treatment, participants were given a picture of a young girl from Africa and a brief description of her, noting that she faced the threat of starvation and that participants’ donations would change her life for the better. In a third treatment, participants were provided with both the statistical information and the picture and description. Donations were highest with the second treatment and lowest with the first. The authors’ interpretation of this result is that people give more when they can

¹ There is a non-experimental literature which analyses why some countries receive more foreign aid than others. With a few exceptions (such as Feeney and Clarke, 2007), this literature focuses on aid from official sources (i.e. bilateral and multilateral aid), rather from private individuals via NGOs. Key papers in this literature include Burnside and Dollar (2000) and Alesina and Dollar (2000). Poorer and more democratic countries generally receive more aid. There is also evidence that governments give more aid *per capita* to former colonies and countries with smaller populations.

picture the individual recipient; providing statistical information just creates a perception that the problem of poverty is too overwhelming for anything to be done.

Fong and Luttmer (2009) explore whether donations to two local charities in the US depend on perceptions about the worthiness of the recipients. Their study was carried out online. Participants saw photographs of charity recipients, and heard an audio tape with information about the charity. Different treatments varied the information about the charities and their recipients, in order to give different impressions about their worthiness. A subsequent survey was designed to elicit participants' perceptions about worthiness. Moreover, some participants were shown photographs of mainly black recipients, and others photographs of mainly white recipients. On average, participants rated their own racial group as more worthy, but did not give more to them. However, more money was given in treatments designed to create impressions of greater worthiness.

Brañas-Garza (2006) explores whether the amount given to overseas charities by students at two Spanish universities depends on being told that the money will go to poor people, and on information about what the money will be used for. In the *no information* treatment, each participant was given three 5-Euro notes and told that she could divide these between herself and three other people; no information about the recipients was provided. In the *poverty* treatment, each participant was told that the recipients were poor communities in undeveloped countries and that 'this amount of money can be very useful in these countries'. In the *medicines* treatment, participants were given the same information as in the *poverty* treatment, and also told that the money would be used to buy medicines. In the *no information* treatment the mean donation was €1.50. This increased to €9 for the *poverty* treatment and to €12 for the

medicines treatment. Providing information about the recipients, especially drawing attention to their poverty, increases donations in the Dictator Game.

2.2. Experimental behavior and participant characteristics

Although they are not directly concerned with charitable giving, other experiments explore the correlations between participants' decisions and their observable characteristics. Many of these focus on correlations with the subjects studied by student participants, with an emphasis on Economics majors compared to others. The results are very mixed. For example, Frey and Meier (2005) and Yezer *et al.* (1996) present evidence from Dictator Games indicating that Economics majors are significantly more generous than majors in many other subject areas, including business disciplines. However, Carter and Irons (1991) find that Economics majors are significantly less likely to propose egalitarian shares in an Ultimatum Game, and Frank *et al.* (1993) find that Economics professors report significantly less generosity in charitable giving than professors in other subjects. There is a large body of evidence on either side; however, one point of agreement, when experiments involve students from different years, is that the study of Economics is associated with a selection effect rather than a treatment effect. The decision to study Economics is often associated with significantly more or significantly less generosity, but conditional on this decision, learning more Economics makes no difference. Such a selection effect is likely to depend on the alternatives to Economics in the university providing the student sample. Variations in the range of subject choice may explain variations in experimental outcomes.

Other experimental studies have explored links between Dictator Game behavior and gender (for example, Carpenter *et al.*, 2008; De Oliveira *et al.*, 2011), but with no conclusive overall result (Eckel and Grossman, 2008). There are more

conclusive results regarding Dictator Game behavior and group membership. A greater concern for charity is manifested in games played with fellow group members than in games played with outsiders; this is true both of naturally occurring groups (Bernhard *et al.*, 2006; Goette *et al.*, 2006) and of experimentally created ones (Chen and Li, 2009). These papers do not look directly at the impact of having some group membership (rather than none at all) on charity towards outsiders, but there are two ways in which donations to charity might depend on whether the participant is a member of a group. Firstly, the participant might value the status and reputation of the group (Wichardt, 2009); secondly, a taste for group membership might be associated with greater generosity towards outsiders (Wilson, 2000).

Other experimental studies have examined the effect on behavior of a range of characteristics, such as age and income, which are not relevant to our experiments using a relatively homogenous student sample. Nevertheless, in the light of the results discussed above, our experimental design allows for the effect on generosity of subject choice, gender and group membership.

3. Experimental Method and Protocol

Student participants in our experiments were recruited from a variety of first-year classes at a New Zealand university. Because not all classes were used for recruitment, the distribution of students by major subject in our sample, summarized in Table 1, does not match that for the university as a whole. The largest groups in our sample are students from Law, Economics (including Finance), Psychology (including Neuroscience), and a number of business subjects, including Accounting, Marketing and Management. Other students are from a range of different science and humanities subjects. Our student participants were recruited from first-year lectures, and take a wide range of papers outside of their chosen major subject, so we are likely

to be observing selection effects rather than treatment effects. Given the mixed results in the existing literature, we have no strong prior about the correlations between generosity and subject choice in our sample. However, it may be relevant that at the university providing our sample of students, there are many alternatives to Economics that are connected to commerce and the professions, including Law, Medicine and Accounting. At our university, students whose choice of subject is career-driven have several alternatives to Economics, many of which are explicitly vocational, so our Economics majors are more likely to behave like majors in science and arts subjects.

We made a brief announcement about the research project at the start of class. Students were told that if they chose to take part in the research, they would be given an evening, time and venue at which they would be asked to complete a survey about student life, and to take part in a short experiment on decision making. They were told that they would be paid \$20 for participating, and that they would be giving up no more than 50 minutes of their time. All students in the classes were then sent an e-mail repeating this information, and asking them to e-mail one of the research assistants if they wished to take part. To ensure that our sample was relatively homogenous, we stated that only students who were aged 18-20 and had lived in New Zealand for at least ten years were able to participate.

Having the participants complete a survey gave us a reason for paying them \$20. An alternative would have been to give them \$20 for no effort, and then ask if they wanted to donate some of it to World Vision. However, participants are likely to have thought of such a payment as a windfall gain. Letting students know in advance that they would be paid \$20 for taking part in a survey was intended to encourage them to view their payment as earned money. This would more closely mimic a real world situation in which people are asked to donate their own earned income to

charity. Previous research (for example, Cherry *et al.* 2002; Cherry and Shogren, 2008) has shown that experimental participants are likely to be less generous with earned money (for example, payment for performance on a GMAT test) than with windfall gains. The survey also provided us with information on individual characteristics that could affect the amount given.

The experiments took place over two consecutive evenings in two different rooms at the university.² Just over 200 students had indicated they would take part in the research, but ultimately 172 turned up. Two different experiments were conducted in the two rooms, as described below, but the first part of the experimental protocol was the same in both rooms.

Before the students arrived, a white envelope and pen were placed on each desk. The envelope contained their \$20 payment, which was made up of one \$10 note, one \$5 note (the smallest denomination note in New Zealand), two \$2 coins and one \$1 coin. Once all participants were seated, each was handed a copy of the survey to complete.³ This survey, which appears in Appendix 1, included a number of demographic questions, plus some questions about student life, and some general knowledge questions about the local area. (The general knowledge questions were designed to have no obvious connection to the theme of charity and international development. The answers to them are not significantly correlated with experimental behavior.) The key questions in our survey related to the following four characteristics. The first three related to key characteristics discussed in the literature review above:

² The day on which a participant took part in an experiment is not significantly correlated with experimental behavior.

³ The participants could not see each other's answers.

- Gender;
- Intended major subject;
- Whether the participant was an active member of any voluntary organisation or club, and if so, what type of club.

The fourth characteristic reflects the fact that our experiment involved a particular type of charity that might appeal more to those participants with an interest in international affairs:

- How often the participant followed news from around the world, for example through television, the internet, or newspapers. (The possible answers were: every day, once a week, between once a week and once a month, never.)

Descriptive statistics relating to the answers to these questions appear in Table 1.⁴ There is a roughly equal number of male and female participants, and of club members and non-club members. We disaggregate the club members into those who are part of a sports club (the majority) and those who are a member of some other club, henceforth designated ‘social club’ members. There is also some variation in the frequency with which participants follow the world news. Note that these descriptive statistics exclude six participants who failed to follow all of the instructions correctly during the experiments. Data for these six participants are excluded from the analysis. For each of our two experiments the final sample size is 83.

⁴ The survey included some other questions originally intended for use in our analysis, in particular self-reported happiness and frequency of participation in organized religious activities. However, only three participants responded that they were not happy, and only three responded that they frequently took part in organized religious activities. These numbers are lower than in previous experiments at the university, but these experiments involved a different distribution of students; for example, they excluded Law students.

Next, participants were each given a gold and a brown envelope, which they were told not to open yet. Participants were then told that we were about to conduct a short exercise related to charitable giving. At this point, the experiment differed between the two rooms. In one room there was a within-group experimental design, and the following text was read to participants.

‘We would now like to give you the opportunity, if you wish, to donate some, or all, of your \$20 payment to World Vision New Zealand⁵ who will use the money to expand educational opportunities in two African countries. The gold form inside the gold envelope provides information on two different countries, and you can choose to give money to World Vision’s work in both, one or neither of them. We have not given the names of the countries, and this is part of our research methodology. However, the countries are real, and the information provided on the countries is factually correct.

‘Any money you choose to donate to World Vision will be matched by us dollar for dollar (in other words, we will double your donation) and we will forward all money directly to World Vision. You are under no obligation to donate any money to World Vision unless you wish to do so, and your decision is completely anonymous. We have designed this exercise in such a way that no-one will ever know how much any individual has given.’

The participants were then instructed to open the gold envelope, which contained information about the two countries, including the fact that the majority of people

⁵ World Vision is an international development charity well known in Australasia. World Vision New Zealand runs operations in seven African countries and seven other developing countries worldwide. See www.worldvision.org.nz.

there live on an income of less than \$3 per day. For one country (henceforth the ‘Global Warming’ country), there was additional information as follows.

‘One reason given for low incomes in this country is that the country is increasingly subject to drought as a result of global warming caused by green house gas emissions in other parts of the world (average rainfall in this country has been falling since the 1970s and is now only 15cm per year approximately).’

For the other country (henceforth the ‘Large Family’ country), the additional information was as follows.⁶

‘One reason given for low incomes in this country is that people in this country choose to have large families. The average number of children born per woman in this country is 6.3, which is one of the highest in the world.’

The ‘Global Warming’ information was intended to indicate a reason for poverty in the country that is completely beyond the control of the inhabitants. The ‘Large Family’ information was intended to indicate that a reason for poverty in the country that is a consequence of individual choices there. The information was not intended to be emotive, so our experimental design differs from that of papers such as Small *et al.* (2007), and there was no variation in information about how the money would be used, so our experimental design differs from that of papers such as Brañas-Garza (2006). Nor was there any explicit suggestion that the ‘Global Warming’ country was more deserving of charity. However, the information provided the participants with

⁶ The order in which the two countries were listed varied randomly between participants. This order is not significantly correlated with experimental behavior.

the opportunity to distinguish between the two countries for reasons often cited in the popular media.⁷

Below the information on the two countries was a form that that students were invited to complete, indicating how much of the \$20 they wished to donate to each country, and how much the country would receive as a result, once the donation had been doubled. It was explained to the participants that because of the combination of notes and coins in their white envelope, it was possible for them to donate any whole dollar amount to World Vision.⁸ It was made clear to the participants that they were under no obligation to donate any money. Participants were then asked to place the completed form in the brown envelope. This form also appears in Appendix 1.

Having made their decision, participants were invited one at a time to go behind one of two screens at the front of the room. Here, each participant placed into the brown envelope her completed survey and donation form, along with the actual cash donation, and put the brown envelope in a box beside the door as she left the room. Since we had no way of matching participants to envelopes, our methodology ensured a double-blind protocol, protecting the anonymity of the participants.

⁷ See for example www.independent.co.uk/environment/climate-change/indias-hidden-climate-change-catastrophe-2173995.html and www.vancouversun.com/technology/Rapidly+growing+Central+Africa+cannot+ignored+long/5005501/story.html. In fact, the ‘Global Warming’ country was a semi-arid country in the Sahel, and the ‘Large Family’ country was a country in Equatorial Africa with high rainfall. We should stress that we do not intend to suggest that high fertility rates are a reason for lower aid to a developing country; nevertheless, this is an argument aired in the popular media.

⁸ One potential concern is that when facing a combination of notes and coins, the participants might have been tempted to donate the smaller denominations (especially the coins) and keep the larger denominations. This could be seen as framing the amount of money participants were likely to give. However, this is not necessarily a major cause for concern. When people are approached in the street and asked to donate to charity, a common response is to donate loose change, so our experimental design mimics what we might expect to happen in reality.

The experimental protocol in the other room was similar, except that each gold envelope contained information about just one of the two countries, and the participants were invited to donate money to just that country. In this between-groups design, the two different treatments – the two different pieces of information – were allocated to participants at random on each night. Each participant saw only the information in her envelope; she was told that other participants had different information, but not what that information was.

Our two sets of parallel results, one using a within-group design and another using a between-groups design, can be used to explore the sensitivity of participant behavior to the range of choices they are given. The between-groups design corresponds more closely to a case in which a charity with an appeal for a specific cause solicits the attention of potential donors, either through a street collection, in the mail, or through electronic media. The within-group design corresponds more closely to a case in which a charity or group of charities makes a more general advertisement.

4. Theoretical Background

This section reviews some of the theory relevant in interpreting the results in each of our two experiments. Each of the two types of theory discussed here is potentially applicable to our results. Our discussion of which is more plausible is left until later.

4.1. Outcome-based theories

The most straightforward interpretation of any correlation of donations with the treatment, or with participant characteristics, is that it measures the extent to which these factors influence the participant's marginal utility from her own consumption compared with her marginal utility from the consumption of others. As

well as valuing her own consumption, a participant might value the consumption of others directly, as in Andreoni and Miller (2002), or care about other people's consumption relative to hers, as in Bolton and Ockenfels (2000).⁹ In this case, the allocation of the endowment between the participant and the charity can be seen as a relatively straightforward utility maximization exercise.

In this model, individuals make utility-maximizing choices that are based solely on outcomes. Their decisions are context-independent, and we should expect experimental behavior to reflect the utility function that underlies everyday decision-making. Participants were free to donate the \$20 to the charity suggested in our experiment, or to spend it on themselves, or – if they took the money home – to donate it to any other charitable cause. The only economic factors distinguishing this \$20 from any other \$20 of marginal income were the accompanying subsidy on charitable donations, and the low transactions costs associated with such donations. Moreover, unless the information presented in the experiment was news to some of the participants – in other words, they were not previously aware of the argument that poverty is caused by high fertility rates, or the argument that it is caused by global warming – then donations to each country in the between-groups experiment should not be significantly different from donations in the within-group experiment. Even in the between-groups experiment, participants would be able to compare the country with which they are presented to other countries and charitable causes with which they were familiar.

4.2. Theories incorporating self-deception and self-image

A participant's choices might affect her utility in another way, by forcing an updating of her beliefs about the sort of person she is, an updating that she normally

⁹ See Fehr *et al.* (2005) for a review of related papers.

avoids. People have an incentive to avoid knowledge that can be expected to reduce their utility level, and to try to forget about things that make them unhappy. The ‘hedonic disutility of information’ could be substantial enough to make willful ignorance a utility-maximizing outcome, even if having less information reduces the efficiency of individual decisions (Akerlof and Dickens, 1982; Karlsson *et al.*, 2009). This argument applies to knowledge about one’s own personal characteristics, and some level of self-deception about one’s own characteristics can be an equilibrium strategy (Bénabou and Tirole, 2002; Mijovic-Prelec and Prelec, 2010). One manifestation of such self-deception is a willingness to pay to avoid making a choice between altruism and selfishness, and evidence for this effect is presented in the Dictator Game experiments of Lazear *et al.* (2005) and Dana *et al.* (2006). If the participant chooses to play the Dictator Game, then she must update her beliefs about how altruistic she is. A risk-averse participant who admires altruism is better off believing that she would *probably* have behaved altruistically than finding out for sure, so a cost is incurred in playing the game. This explains why some participants prefer to take a small sum and avoid playing the game rather than act as a Dictator allocating a larger sum.

In our experiments, participants were forced to make a choice about whether to be altruistic, and so forced to update their beliefs about their own character. Variation in experimental behavior could arise not only from differences in innate altruism, but also from differences in the value of self-image or the propensity for self-deception. If there is a systematic correlation between total donations and a particular personal characteristic, this could be interpreted in terms of the impact of the characteristic on the value of self-image, or on the extent to which a particularly large or small donation leads to a revision of self-image. Similarly, the impact of the

chosen donation on updated beliefs might depend on the treatment, if a participant found it easier to reconcile a low donation to the ‘Large Family’ country with a belief that she was of a generous disposition.

In this model, there is no reason why behavior in the within-group experiment should resemble behavior in the between-groups experiment. Participants in the within-groups experiment were forced to bring to mind two reasons for poverty in Africa, but participants in the between-groups experiment were forced to bring to mind only one. This might well create asymmetries in the disutility participants incurred from the information with which they were presented (depending on how easy it was to forget), and so differences in the utility-maximizing response.

5. Experimental Results

5.1. The within-group results

Figures 1-2 show distributions of donations to each of the two countries in the within-group experiment. In both cases, the modal donation is zero, but the mean donation to the ‘Large Family’ country is \$1.74, compared with a mean donation to the ‘Global Warming’ country of \$2.54. The null that the two are equal in the population can be rejected at the 1% level: a Wilcoxon signed-rank test produces a t-statistic of -4.50 . There are no donations between \$5 and \$10, and no donation greater than \$10. There are several alternative ways to model the data, depending on how we treat the \$5 and \$10 observations. In all cases, we need a model that allows for the censoring of the data at zero and a potential correlation between donations to the two countries across participants. The simplest model fulfilling these criteria is a random-effects Tobit regression:

$$y_{ij}^* = \beta_0^F + \beta_0^G \cdot global_i + \sum_k [\beta_k^F + \beta_k^G \cdot global_i] \cdot x_{jk} + \varepsilon_j + \eta_{ij} \quad (1)$$

$$y_{ij} = 0 \quad \text{if} \quad y_{ij}^* < 0 \quad (1a)$$

$$y_{ij} = y_{ij}^* \quad \text{if} \quad y_{ij}^* \geq 0 \quad (1b)$$

In these equations, y_{ij} is participant j 's donation to country i , where $i \in \{F, G\}$, F being the 'Large Family' country and G the 'Global Warming' country. This donation is constrained to lie between zero and \$20, but there is a corresponding unbounded latent variable, y_{ij}^* , which might be interpreted as the 'level of generosity'. The expected value of this latent variable depends on the recipient country: $global_i = 0$ when $i = F$ and $global_i = 1$ when $i = G$. It also depends on the different characteristics of participant j , the k^{th} characteristic being denoted x_{jk} . These binary characteristics are defined as follows.

- $[male]_j$ indicating if j is male;
- $[infrequent\ news]_j$ indicating if j reads the news less than once a week;¹⁰
- $[social\ club]_j$ indicating if j is a member of a social club;
- $[sports\ club]_j$ indicating if j is a member of a sports club;
- $[economics / finance]_j$ indicating if j is an Economics or Finance student;
- $[marketing / management]_j$ indicating if j is a Marketing or Management student;
- $[psychology / neuroscience]_j$ indicating if j is a Psychology or Neuroscience student;
- $[law]_j =$ indicating if j is a Law student;
- $[other]_j =$ indicating if j is a student of some other subject (but not Accounting).

¹⁰ We can also distinguish between following the news every day and following the news less frequently, but at least once a week. This distinction produces no statistically significant results.

The effect of each characteristic might depend on $global_i$, so equation (1) also includes some interaction terms. Finally, ε_j is a participant-specific random effect with a mean of zero and a variance of σ_1^2 , and η_{ij} is a regression residual that is orthogonal to the random effect; this residual has a mean of zero and a variance of σ_2^2 . Including a random effect takes account of the possibility that unobserved characteristics associated with overall participant generosity lead to a correlation between y_{Fj} and y_{Gj} .

The parameters in equation (1) are to be interpreted as follows. β_0^F measures the level of generosity towards the ‘Large Family’ country of a participant for whom all of the characteristics x_{jk} are equal to zero (that is, a female Accounting student who is not a member of any club, and who frequently follows the news). β_0^G measures the *additional* generosity of such a participant towards the ‘Global Warming’ country. The β_k^F parameters measure differences in the level of generosity towards the ‘Large Family’ country associated with each participant characteristic (being male, studying something other than Accounting, being a member of a club, following the news only infrequently). The β_k^G parameters measure the extent to which each characteristic changes the additional generosity of a participant towards the ‘Global Warming’ country. In order to interpret the fitted model, we will also calculate linear combinations of the β parameters, in order to compare the level of generosity of particular types of participant to each of the two countries.

Equation (1b) treats all of the \$10 donations as uncensored observations, because the maximum possible donation was \$20. However, most of those participants who gave \$10 to one country gave \$10 to both, that is, they donated all of their endowment. We can fit a more complex model that distinguishes between the

two different types of \$10 donation, and treats the double-\$10 donations as censored observations. Equation (1b) is replaced by:

$$y_{ij} = y_{ij}^* \quad \text{if} \quad \$10 \geq y_{ij}^* \geq 0 \quad (1c)$$

$$y_{ij} = \$10 \quad \text{if} \quad y_{Fj}^* > \$10 \quad \text{and} \quad y_{Gj}^* > \$10 \quad (1d)$$

Finally, if there is some reason for participants finding donations between \$5 and \$10 particularly unattractive, then equation (1c) can be replaced by:

$$y_{ij} = y_{ij}^* \quad \text{if} \quad \$5 \geq y_{ij}^* \geq 0 \quad (1e)$$

$$y_{ij} = \$5 \quad \text{if} \quad \$n \geq y_{ij}^* > \$5 \quad (1f)$$

$$y_{ij} = \$10 \quad \text{if} \quad \$10 \geq y_{ij}^* > \$n \quad (1g)$$

Here, n is some value between 5 and 10. This final model might be appropriate if, for example, equation (1) is a linear approximation to a discontinuous function. One way that such a discontinuity could arise is if the utility from donating 50% of the endowment (\$5 to each country) is no smaller than the utility from donating most – but not quite all – of the endowment. The results in the main text are based on fitting equations (1-1b) to the data. Results from the alternative models are presented in Appendix 2; these results are very similar to the ones we now discuss.

Table 2 includes estimates of the β parameters in equation (1), and of σ_1 and σ_2 , along with the corresponding t-ratios. Also included in the table are the ratio of σ_1^2 to $[\sigma_1^2 + \sigma_2^2]$, and the ratio of $[\sigma_1^2 + \sigma_2^2]$ to the total variation in the data.¹¹ Both of these quantities are close to 0.8, indicating that about 80% of the variation in the

¹¹ This total is calculated by fitting a Tobit model in which the only parameter is β_0^F . The models are fitted using the *xttobit* command in Stata 11.

data is due to unobserved factors, and that about 80% of this 80% is due to unexplained variation in overall participant generosity. The regressors in equation (1) explain about 20% of the variation in the data, making them jointly significant at the 1% level ($\chi^2_{19} = 47.4$), but most of the variation is due to differences in overall generosity across participants that is not correlated with any observable characteristic.

The β^F parameters in the table show that there are significant differences in generosity towards the ‘Large Family’ country across participant types. Club members are significantly more generous on average than others, with social club members being the most generous. Accounting students are significantly less generous on average than other students; the most generous are Economics / Finance and Psychology / Neuroscience students. However, gender and attention to the world news have no significant effect on generosity towards the ‘Large Family’ country.

The large and statistically significant β_0^G parameter in Table 2 indicates that the non-club members studying Accounting are significantly more generous towards the ‘Global Warming’ country, on average, than they are towards the ‘Large Family’ country. However, the other β_k^G parameters are negative, indicating that for other participants this generosity margin is smaller, in some cases significantly so. In order to interpret all of these differences, we calculate the expected values of y_{Fj}^* and y_{Gj}^* for different types of participant, and expected values of $y_{Gj}^* - y_{Fj}^*$. These values, and the corresponding t-ratios,¹² are presented in Tables 3-5. Each table reports expected values by subject choice and by club membership. In each case, the figure relates to female participants who frequently follow the world news; figures for males and infrequent news followers are very similar.

¹² The t-ratios are calculated using the Delta Method.

Table 3 shows that for most types of participant, the expected value of y_{Fj}^* is insignificantly different from zero. That is, in most cases, the average participant of a particular type is approximately indifferent between giving nothing to the ‘Large Family’ country and giving a small amount. (This implies that the expected value of y_{Fj} is significantly greater than zero: for observations of y_{Fj}^* below the mean, $y_{Fj} = 0$; for observations of y_{Fj}^* above the mean, $y_{Fj} > 0$.) One exception is the Accounting students, for whom y_{Fj}^* is significantly less than zero, unless they are members of a social club. On average, such students would *definitely* prefer not to give anything to the ‘Large Family’ country. Another exception is the social club members who study Economics / Finance or Psychology / Neuroscience. The average donation of such students to the ‘Large Family’ country is expected to be \$6-\$7, which is significantly greater than zero.

In Table 4, the expected value of y_{Gj}^* for all non-club members (regardless of subject choice) is insignificantly different from zero. Club members are more generous, and for all social club members (regardless of subject choice), the expected value of y_{Gj}^* is significantly greater than zero. There is little variation in the expected donation across subject groups, which in all cases is in the \$6-\$9 range.

Table 5 shows which types of participant are significantly more generous towards the ‘Global Warming’ country than they are to the ‘Large Family’ country, on average. These are the Accounting students and the non-club members (except those studying Economics / Finance or Psychology / Neuroscience). The largest effect is for the non-club members studying Accounting, for whom the expected value of $y_{Gj}^* - y_{Fj}^*$ is over \$6. The Wilcoxon test reported above indicates that total donations to the ‘Global Warming’ country are significantly larger than those to the ‘Large

Family’ country. Table 5 indicates that this difference is due to the behavior of a particular subset of the participants.

5.2. The between-groups results

Figures 3-4 show distributions of donations to each of the two countries in the between-groups experiment. The modal donation is zero for the ‘Large Family’ country and \$5 for the ‘Global Warming’ country; the corresponding means are \$4.33 and \$4.58 respectively. The difference in modes and similarity in means reflects a higher variance in the ‘Large Family’ distribution. However, the null that the two sample distributions are drawn from the same population cannot be rejected at conventional confidence levels: a Wilcoxon rank-sum test produces a t-statistic of -1.34 . There are almost no donations between \$5 and \$10, or between \$10 and \$20, but some participants did donate the whole \$20. Again we use Tobit regression to model the data, but since each participant makes a single choice there is no decomposition of the error term:

$$y_j^* = \beta_0^F + \beta_0^G \cdot global_j + \sum_k [\beta_k^F + \beta_k^G \cdot global_j] \cdot x_{jk} + \varepsilon_j \quad (2)$$

$$y_j = 0 \quad \text{if} \quad y_j^* < 0 \quad (2a)$$

$$y_j = y_j^* \quad \text{if} \quad \$20 \geq y_j^* \geq 0 \quad (2b)$$

$$y_j = \$20 \quad \text{if} \quad y_j^* > \$20 \quad (2c)$$

In these equations, y_j is participant j ’s single donation and y_j^* the corresponding latent variable; $global_j = 1$ in the ‘Global Warming’ treatment and $global_j = 0$ in the ‘Large Family’ treatment. There is censoring at both zero and \$20. Otherwise, the model is as in equations (1-1b). As in the within-group model, alternative parameterizations are possible, given the paucity of observations between \$5 and \$10 (and between \$10 and

\$20), but these alternatives do not produce results significantly different from the ones reported here.

Table 6 includes estimates of the β parameters in equation (2), and of σ_1 , along with the corresponding t-ratios.¹³ Also included in the table is the ratio of σ_1^2 to the total variation in the data. This ratio is nearly 0.95, so the regressors in equation (2) explain just over 5% of the variation in the data, which is not a statistically significant proportion ($\chi_{18}^2 = 12.1$). None of the β parameters is significantly different from zero at the 5% level. If all of the parameters except β_0^F and β_0^G are restricted to zero, the t-ratio on β_0^G is still only 1.34. There is no significant treatment effect, and no significant effect of any participant characteristic. In the between-groups experiment, the average participant is approximately indifferent between donating a small amount and donating nothing, and this result does not vary with any observable characteristic.¹⁴

5.3. Possible interpretations of the results

In the within-group experiment, certain types of participant, such as Accounting students, give significantly less to the ‘Large Family’ country than they give to the ‘Global Warming’ country, on average, and significantly less than some other types of participant give to the ‘Large Family’ country. These other participants are not significantly more generous towards one country, on average, than they are towards the other. This could be interpreted simply as a difference in preferences; that

¹³ One of the regressors (the treatment interacted with the Psychology student dummy) is collinear with other variables; the corresponding parameter estimate is excluded from the table.

¹⁴ By adding together the largest β parameters in the table (for example, the parameters on [*infrequent news*], [*social club*] and [*Marketing / Management*]), it is possible to produce a linear combination with a t-ratio just above the 5% critical value. However, given the joint insignificance of the regressors, this is likely to be a spurious result.

is, certain types of participant (but not others) ascribe a relatively low value to consumption in the ‘Large Family’ country, perhaps because this country’s low income is thought to be a consequence of its inhabitants’ choice rather than misfortune or the negligence of others. In this interpretation, the level of altruism of participants with certain characteristics depends on the reason for the country’s poverty. The level of other participants’ altruism does not vary in this way.

However, in the between-groups experiment, there is no significant correlation of the donation with the treatment, and no significant correlation with any recipient characteristic; in all cases, the mean level of generosity is insignificantly different from zero. Within the framework of an outcome-based model, it is not clear why certain types of participant should become significantly less generous towards the ‘Large Family’ country when faced with a choice of countries, while other types become significantly more generous towards both countries when faced with this choice. The existence of multiple reasons for poverty might be news to some of the participants, but it is difficult to see how the revelation of such news would generate the pattern of responses that we observe in the data.

This suggests that we consider the possibility that decisions about charitable donations depend on the context in which they are made, with the effect of the context varying according to the role of self-image in the decisions of each participant type. One interpretation involving context dependence goes as follows. For an ‘ungenerous’ type (for example, an Accounting student not in a social club), the average values of y_{Gj}^* and y_{Fj}^* in the between-groups experiment and the average value of y_{Gj}^* in the within-group experiment are insignificantly different from zero; the average value of y_{Fj}^* in the within-groups experiment is significantly less than zero. Having both of the reasons for poverty instead of just the one reduces generosity towards to the ‘Large

Family' country without increasing generosity towards the 'Global Warming' country. This is consistent with rational choice, if being able to make the comparison between the two countries in the within-group experiment provides a reason for a participant to justify a low donation to the 'less deserving' one as a punishment that does not indicate a lack of overall generosity. (Why is the 'Large Family' country not punished in the same way by Accounting students in the between-groups experiment? Because this would require a deliberate effort to call to mind more deserving causes, something which the participant prefers not to do if she has the choice.¹⁵) For a 'generous' type (for example, an Economics / Finance student in a social club) the average values of y_{Gj}^* and y_{Fj}^* in the between-groups experiment are again insignificantly different from zero, but the average values of *both* y_{Gj}^* and y_{Fj}^* in the within-group experiment are significantly greater than zero. This is consistent with rational choice, if the extra information in the within-group design leads such participants to think more deeply about their choices. The extra depth of thought will make the choices more difficult to forget afterwards, so the cost of selfish behavior is higher.

6. Conclusion

A set of simple Dictator Game experiments reveals some of the factors driving decisions about how much money to give to an international development charity. In a between-groups experiment in which participants are given a choice between donating money to one of two countries and keeping the money for themselves, there is no significant correlation of generosity with participant characteristics, or with the

¹⁵ In this interpretation, the extra information provided in the within-group experiment might allow the participant to reduce her donation to the 'Large Family' country at a low psychic cost, and to walk away with more money, but this extra money does not necessarily fully compensate her for having been forced to think about the 'Global Warming' country in the first place.

information given about the country. When participants are faced with a choice between two countries in a within-group experiment, some types of participant donate significantly more money to both countries than the average donation in the between-groups experiment. Other types of participant in the within-group experiment donate significantly less to one of the two countries, but not to the other. Different types of participant appear to respond in different ways to being given a choice of two countries rather than one.

One possible interpretation of the results is that some participants respond more generously when provided with information that encourages them to compare and contrast different reasons for recipient need. In this case, greater depth of thought does not lead to greater generosity to one country compared with the other, but greater generosity to both. Other participants appear to use the contrasting information as a justification for ‘punishing’ one country, but without rewarding the other one. Both types of behavior are consistent with a self-image model, but with different psychological processes at work in different participants.

The two experiments correspond to different real-world situations. The between-groups experiment reflects a situation in which a potential donor is asked to donate money to a specific cause; the within-group experiment reflects a situation in which the donor faces a more general appeal. Our experimental results suggest that many people’s response will vary from one situation to the other, but not in ways that are easy to predict without information about their personality type. Some people may be persuaded to give more money if presented with a wide range of information that encourages them to consider more deeply the different causes of poverty. However, the effectiveness of such a strategy by a charity would depend on being able to identify a particular personality type.

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Table 1Summary Statistics ($N = 166$)

<i>major subject groups</i>	<i>number</i>	<i>other characteristics</i>	<i>number</i>
Accounting	22	Female	91
Economics / Finance	22	Male	75
Marketing / Management	31	Follows the news every day	91
Psychology / Neuroscience	13	Follows the news once a week	58
Law	41	Follows the news infrequently	17
other	37	Social club member	11
		Sports club member	65
		Not a member of any club	90

Table 2

Random-Effects Tobit Regression Results for the Within-Group Model: Equations (1-1b)

variable	coeff.	t ratio	variable	coeff.	t ratio
intercept	-6.359	-3.549	$[global]_i$	6.401	4.864
$[male]_j$	0.236	0.214	$[global]_i * [male]_j$	-0.747	-1.051
$[infrequent\ news]_j$	2.613	1.473	$[global]_i * [infrequent\ news]_j$	-0.915	-0.847
$[social\ club]_j$	6.205	2.394	$[global]_i * [social\ club]_j$	-1.555	-1.057
$[sports\ club]_j$	2.176	1.979	$[global]_i * [sports\ club]_j$	-0.883	-1.253
$[economics / finance]_j$	7.060	3.279	$[global]_i * [economics / finance]_j$	-4.565	-3.105
$[marketing / management]_j$	4.534	2.157	$[global]_i * [marketing / management]_j$	-4.259	-2.849
$[psychology / neuroscience]_j$	6.892	3.271	$[global]_i * [psychology / neuroscience]_j$	-6.132	-4.230
$[law]_j$	4.934	2.555	$[global]_i * [law]_j$	-3.744	-2.709
$[other]_j$	4.146	1.979	$[global]_i * [other]_j$	-4.023	-2.684
σ_1	3.771	8.645	$\sigma_1^2 / [\sigma_1^2 + \sigma_2^2]$	0.846	
σ_2	1.606	8.901	$[\sigma_1^2 + \sigma_2^2] / total\ variance$	0.795	

Table 3Implicit Value of $E[y_{Fj}^*]$ by Major Subject and Club Membership[§]

	<i>no club membership</i>		<i>social club members</i>		<i>sports club members</i>	
	coeff.	t ratio	coeff.	t ratio	coeff.	t ratio
<i>accounting</i>	-6.36	-3.55	-0.15	-0.05	-4.18	-2.30
<i>economics / finance</i>	0.70	0.44	6.91	2.38	2.88	1.88
<i>marketing / management</i>	-1.83	-1.21	4.38	1.53	0.35	0.22
<i>psychology / neuroscience</i>	0.53	0.39	6.74	2.37	2.71	1.74
<i>law</i>	-1.42	-1.11	4.78	1.84	0.75	0.53
<i>other</i>	-2.21	-1.51	3.99	1.62	-0.04	-0.02

§ *These values are for female participants who frequently follow the world news. Effects for male participants and infrequent followers of the news are not significantly different.*

Table 4Implicit Value of $E[y_{Gj}^*]$ by Major Subject and Club Membership[§]

	<i>no club membership</i>		<i>social club members</i>		<i>sports club members</i>	
	coeff.	t ratio	coeff.	t ratio	coeff.	t ratio
<i>accounting</i>	0.04	0.03	6.25	2.18	2.22	1.38
<i>economics / finance</i>	2.54	1.62	8.74	3.00	4.71	2.94
<i>marketing / management</i>	0.32	0.22	6.52	2.29	2.49	1.56
<i>psychology / neuroscience</i>	0.80	0.58	7.01	2.45	2.98	1.85
<i>law</i>	1.23	1.01	7.44	2.81	3.41	2.39
<i>other</i>	0.16	0.12	6.37	2.49	2.34	1.38

§ *These values are for female participants who frequently follow the world news. Effects for male participants and infrequent followers of the news are not significantly different.*

Table 5Implicit Value of $E[y_{Gj}^* - y_{Fj}^*]$ by Major Subject and Club Membership[§]

	<i>no club membership</i>		<i>social club members</i>		<i>sports club members</i>	
	coeff.	t ratio	coeff.	t ratio	coeff.	t ratio
<i>accounting</i>	6.40	4.86	4.85	2.56	5.52	4.26
<i>economics / finance</i>	1.84	1.89	0.28	0.17	0.95	1.02
<i>marketing / management</i>	2.14	2.23	0.59	0.35	1.26	1.19
<i>psychology / neuroscience</i>	0.27	0.33	-1.28	-0.79	-0.61	-0.67
<i>law</i>	2.66	3.27	1.10	0.74	1.77	1.97
<i>other</i>	2.38	2.58	0.82	0.60	1.49	1.38

§ *These treatment effects are for female participants who frequently follow the world news. Effects for male participants and infrequent followers of the news are not significantly different.*

Table 6

Tobit Regression Results for the Between-Groups Model: Equations (2-2d)

variable	coeff.	t ratio	variable	coeff.	t ratio
intercept	-0.722	-0.198	[<i>global</i>] _{<i>j</i>}	7.150	1.143
[<i>male</i>] _{<i>j</i>}	-2.734	-0.960	[<i>global</i>] _{<i>j</i>} * [<i>male</i>] _{<i>j</i>}	0.985	0.245
[<i>infrequent news</i>] _{<i>j</i>}	6.156	1.375	[<i>global</i>] _{<i>j</i>} * [<i>infrequent news</i>] _{<i>j</i>}	-10.96	-1.744
[<i>social club</i>] _{<i>j</i>}	3.220	0.524	[<i>global</i>] _{<i>j</i>} * [<i>social club</i>] _{<i>j</i>}	-5.643	-0.777
[<i>sports club</i>] _{<i>j</i>}	4.057	1.356	[<i>global</i>] _{<i>j</i>} * [<i>sports club</i>] _{<i>j</i>}	-8.114	-1.914
[<i>economics / finance</i>] _{<i>j</i>}	3.269	0.671	[<i>global</i>] _{<i>j</i>} * [<i>economics / finance</i>] _{<i>j</i>}	-5.374	-0.715
[<i>marketing / management</i>] _{<i>j</i>}	6.500	1.331	[<i>global</i>] _{<i>j</i>} * [<i>marketing / management</i>] _{<i>j</i>}	-6.871	-0.979
[<i>psychology / neuroscience</i>] _{<i>j</i>}	1.184	0.164	[<i>global</i>] _{<i>j</i>} * [<i>psychology / neuroscience</i>] _{<i>j</i>}		
[<i>law</i>] _{<i>j</i>}	1.954	0.488	[<i>global</i>] _{<i>j</i>} * [<i>law</i>] _{<i>j</i>}	-0.588	-0.083
[<i>other</i>] _{<i>j</i>}	-0.497	-0.110	[<i>global</i>] _{<i>j</i>} * [<i>other</i>] _{<i>j</i>}	1.776	0.255
σ_1	2.032	19.076	$\sigma_1^2 / \text{total variance}$	0.938	

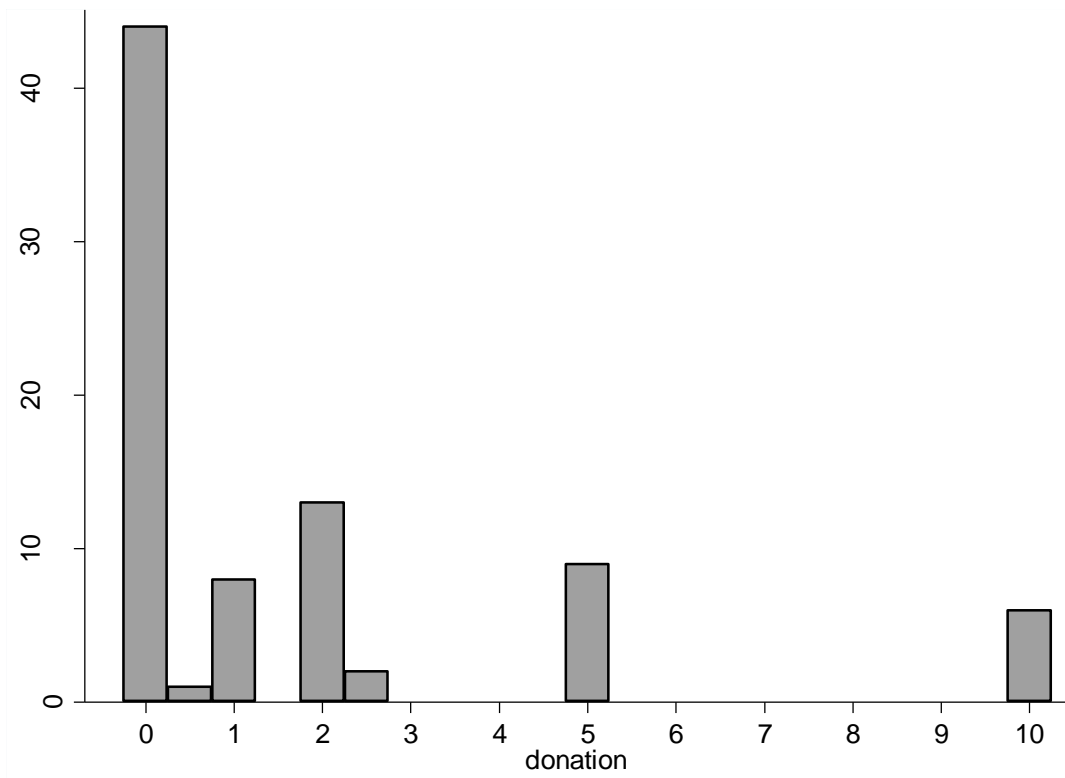


Fig. 1. Distribution of within-group donations to the 'Large Family' country

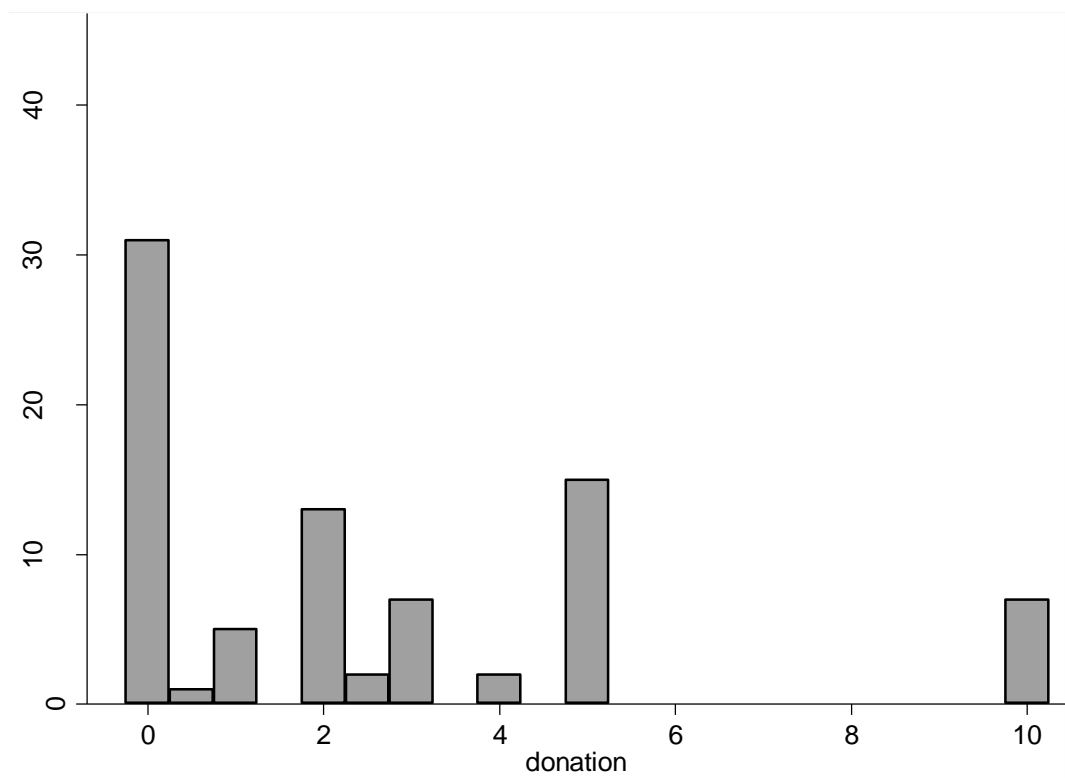


Fig. 2. Distribution of within-group donations to the 'Global Warming' country

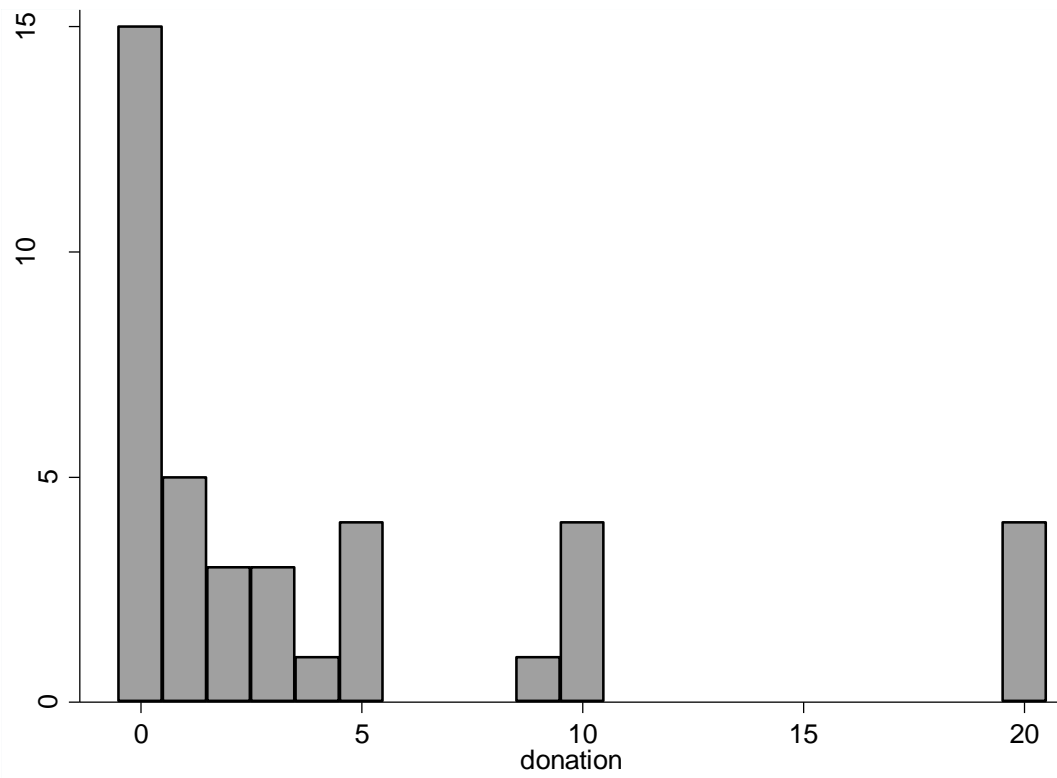


Fig. 3. Distribution of between-groups donations to the 'Large Family' country

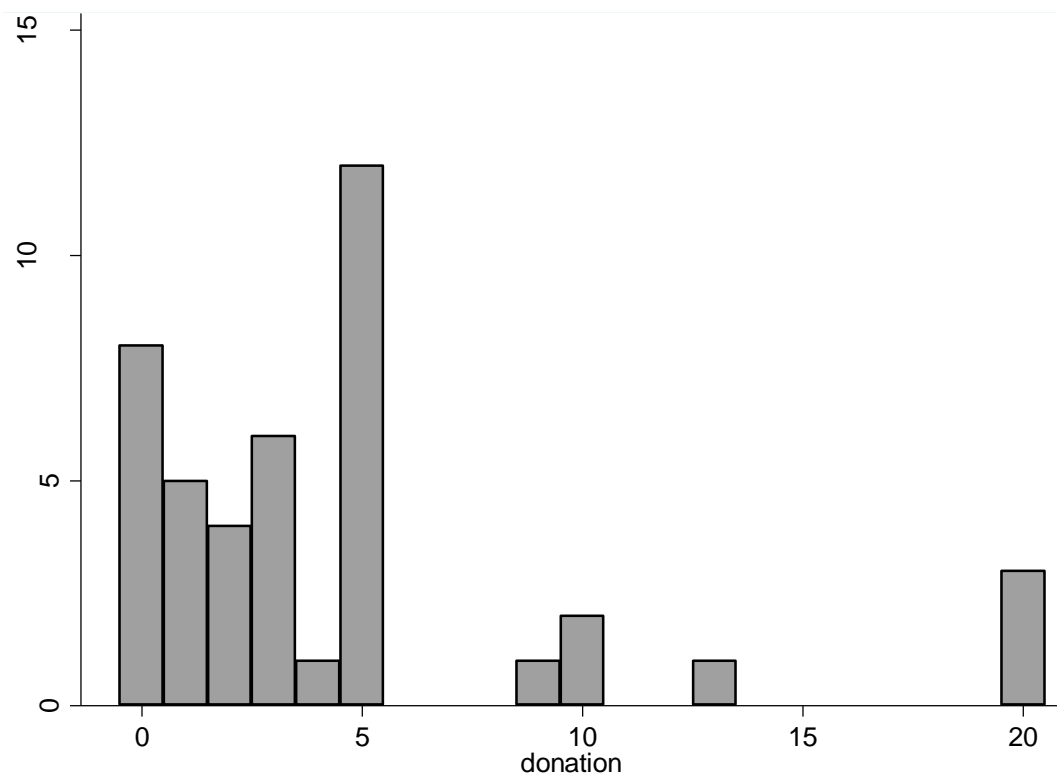


Fig. 4. Distribution of between-groups donations to the 'Global Warming' country

Appendix 1: The Survey and Donation Forms

Survey: [*name of city*] and Student Life

This survey asks questions about yourself, some questions about student life and some general knowledge questions about the University and [*name of city*]. Your responses to the questions will be completely anonymous. No one, including the researchers, will ever know which individuals gave which answers.

Some questions about yourself :

1. Gender: Male Female
2. Intended major subject (if known) _____
3. Have you taken, or are you currently enrolled in, any of the following papers at [*name of university*]? Tick the boxes that apply.
BSNS104 BSNS102 LAWS101 POLS104
4. All things considered, would you say you are generally
very happy quite happy not very happy not at all happy
5. Are you an active member of any voluntary organisation or club (e.g., sports, craft, social club)?
Yes No
If yes, specify what sort of organisation/club _____
6. How frequently do you take part in organised religious activities?
more than once a week between once a week and once a month
infrequently never
7. How often do you follow news from around the world (e.g., through television, the internet or newspapers)?
every day once a week
between once a week and once a month never
8. If you do follow news from around the world, which media do you use the most often?
internet television newspaper
other don't follow world news
9. In an average week, how many nights do you spend out at a bar, club, restaurant or cinema?
6-7 3-5 1-2 0

Some questions about student life and [name of university]:

10. What is the main reason you chose to study at [name of university] rather than at another university?

Academic reputation of [name of university]

Social life at [name of university]

Family/friends in [name of city]

Other

If other, please specify _____

11. For how many years are you planning on studying at [name of university]?

1

2

3

4 or more

12. Where do you live?

Hall of residence

Private flat

Family home

Other

13. Do you have a student loan?

Yes No

14. Do your parents contribute to your fees or living expenses?

Yes No

15. Who is the current Vice Chancellor of [name of university]? _____

16. In what year did [name of university] open? _____

Some general knowledge questions about [name of city]:

17. Who is the current mayor of [name of city]? _____

18. In what year was [name of city] settled? _____

19. What is the name of the church in [name of location]? _____

20. What is the steepest street in [name of city] _____

21. Which former [name of team] rugby coach was the All Black coach at the 1995 rugby world cup? _____

22. Who is the current coach of the [name of team] rugby team? _____

Transfer Forms

1. *Between-groups form ('Global Warming' treatment)*

We would like to give you the opportunity to donate all or some of your \$20 payment, if you wish, to *World Vision New Zealand*. Your donation will be used by *World Vision* to expand educational opportunities for primary-school aged children in a country in Africa where the majority of people live on less than \$3 per day. One reason given for low incomes in this country is that the country is increasingly subject to drought as a result of global warming caused by green house gas emissions in other parts of the world (average rainfall in this country has been falling since the 1970s and is now only 15cm per year approximately).

Please fill in the gaps below and place this form in the brown envelope.

I wish to donate \$_____ to *World Vision*. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ as a result of my donation.

2. *Between-groups form ('Large Family' treatment)*

We would like to give you the opportunity to donate all or some of your \$20 payment, if you wish, to *World Vision New Zealand*. Your donation will be used by *World Vision* to expand educational opportunities for primary-school aged children in a country in Africa where the majority of people live on less than \$3 per day. One reason given for low incomes in this country is that people in this country choose to have large families. The average number of children born per woman in this country is 6.3, which is one of the highest in the world.

Please fill in the gaps below and place this form in the brown envelope.

I wish to donate \$_____ to *World Vision*. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ as a result of my donation.

3. *Within-group form ('Global Warming' country first)*

We would like to give you the opportunity to donate all or some of your \$20 payment, if you wish, to *World Vision New Zealand*. Your donation will be used by *World Vision* to expand educational opportunities for primary-school aged children in Africa. There are two countries that *World Vision* can use these funds in, and you can choose how much, if anything, to give to each of these countries. In both of these countries the majority of people live on less than \$3 per day. Additional information on possible sources of low incomes in the two countries is given below.

Additional Information on Country A

One reason given for low incomes in this country is that the country is increasingly subject to drought as a result of global warming caused by green house gas emissions in other parts of the world (average rainfall in this country has been falling since the 1970s and is now only 15cm per year approximately).

Additional Information on Country B

One reason given for low incomes in this country is that people in this country choose to have large families. The average number of children born per woman in this country is 6.3, which is one of the highest in the world.

Please fill in the gaps below and place this form in the brown envelope.

I wish to donate \$_____ to *World Vision* to use in Country A. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ to use in Country A as a result of my donation.

I wish to donate \$_____ to *World Vision* to use in Country B. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ to use in Country B as a result of my donation.

4. *Within-group form ('Large Family' country first)*

We would like to give you the opportunity to donate all or some of your \$20 payment, if you wish, to *World Vision New Zealand*. Your donation will be used by *World Vision* to expand educational opportunities for primary-school aged children in Africa. There are two countries that *World Vision* can use these funds in, and you can choose how much, if anything, to give to each of these countries. In both of these countries the majority of people live on less than \$3 per day. Additional information on possible sources of low incomes in the two countries is given below.

Additional Information on Country A

One reason given for low incomes in this country is that people in this country choose to have large families. The average number of children born per woman in this country is 6.3, which is one of the highest in the world.

Additional Information on Country B

One reason given for low incomes in this country is that the country is increasingly subject to drought as a result of global warming caused by green house gas emissions in other parts of the world (average rainfall in this country has been falling since the 1970s and is now only 15cm per year approximately).

Please fill in the gaps below and place this form in the brown envelope.

I wish to donate \$_____ to *World Vision* to use in Country A. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ to use in Country A as a result of my donation.

I wish to donate \$_____ to *World Vision* to use in Country B. Given that the researchers will match my donation dollar for dollar, this means *World Vision* will receive \$_____ to use in Country B as a result of my donation.

Appendix 2: Alternative Within-Group Regression Results

Table A1: Random-Effects Regression Results for the Within-Group Model with Right-Censoring: Equations (1-1a, 1c-1d)

variable	coeff.	t ratio	variable	coeff.	t ratio
intercept	-7.095	-3.414	$[global]_i$	6.574	4.657
$[male]_j$	0.278	0.210	$[global]_i * [male]_j$	-0.819	-1.001
$[infrequent\ news]_j$	2.757	1.313	$[global]_i * [infrequent\ news]_j$	-0.979	-0.846
$[social\ club]_j$	7.746	2.381	$[global]_i * [social\ club]_j$	-1.542	-0.835
$[sports\ club]_j$	2.510	1.912	$[global]_i * [sports\ club]_j$	-0.779	-0.989
$[economics\ / \ finance]_j$	7.887	3.099	$[global]_i * [economics\ / \ finance]_j$	-4.540	-2.785
$[marketing\ / \ management]_j$	4.917	2.001	$[global]_i * [marketing\ / \ management]_j$	-4.324	-2.666
$[psychology\ / \ neuroscience]_j$	7.369	2.996	$[global]_i * [psychology\ / \ neuroscience]_j$	-6.326	-4.086
$[law]_j$	5.379	2.394	$[global]_i * [law]_j$	-3.779	-2.543
$[other]_j$	4.306	1.750	$[global]_i * [other]_j$	-4.089	-2.464
σ_1	4.545	7.962	$\sigma_1^2 / [\sigma_1^2 + \sigma_2^2]$	0.878	
σ_2	1.698	8.474	$[\sigma_1^2 + \sigma_2^2] / total\ variance$	0.784	

In this model, observations are uncensored ($y_{ij} = y_{ij}^*$) if $y_{ij} > 0$ and either $y_{Fj} < \$10$ or $y_{Gj} < \$10$. Observations are left-censored ($y_{ij}^* \in (-\infty, 0]$) if $y_{ij} = 0$, and observations are right-censored ($y_{ij}^* \in [\$10, \infty)$) if $y_{Fj} = y_{Gj} = \$10$. The model is fitted using the *xtintreg* command in Stata 11.

Table A2: Random-Effects Regression Results for the Within-Group Model with Right-Censoring: Equations (1-1a, 1d-1g)

variable	coeff.	t ratio	variable	coeff.	t ratio
intercept	-6.901	-3.494	[<i>global</i>] _{<i>i</i>}	7.209	4.933
[<i>male</i>] _{<i>j</i>}	0.305	0.248	[<i>global</i>] _{<i>i</i>} * [<i>male</i>] _{<i>j</i>}	-0.993	-1.180
[<i>infrequent news</i>] _{<i>j</i>}	3.064	1.579	[<i>global</i>] _{<i>i</i>} * [<i>infrequent news</i>] _{<i>j</i>}	-0.821	-0.680
[<i>social club</i>] _{<i>j</i>}	6.571	2.178	[<i>global</i>] _{<i>i</i>} * [<i>social club</i>] _{<i>j</i>}	-1.435	-0.756
[<i>sports club</i>] _{<i>j</i>}	2.126	1.750	[<i>global</i>] _{<i>i</i>} * [<i>sports club</i>] _{<i>j</i>}	-0.622	-0.772
[<i>economics / finance</i>] _{<i>j</i>}	7.620	3.192	[<i>global</i>] _{<i>i</i>} * [<i>economics / finance</i>] _{<i>j</i>}	-5.178	-3.082
[<i>marketing / management</i>] _{<i>j</i>}	4.755	2.061	[<i>global</i>] _{<i>i</i>} * [<i>marketing / management</i>] _{<i>j</i>}	-4.775	-2.870
[<i>psychology / neuroscience</i>] _{<i>j</i>}	7.485	3.247	[<i>global</i>] _{<i>i</i>} * [<i>psychology / neuroscience</i>] _{<i>j</i>}	-7.095	-4.421
[<i>law</i>] _{<i>j</i>}	5.370	2.544	[<i>global</i>] _{<i>i</i>} * [<i>law</i>] _{<i>j</i>}	-4.279	-2.797
[<i>other</i>] _{<i>j</i>}	4.537	1.969	[<i>global</i>] _{<i>i</i>} * [<i>other</i>] _{<i>j</i>}	-4.838	-2.837
σ_1	4.108	7.706	$\sigma_1^2 / [\sigma_1^2 + \sigma_2^2]$	0.849	
σ_2	1.734	5.662			

In this model, observations are uncensored ($y_{ij} = y_{ij}^*$) if $\$5 > y_{ij} > 0$. Observations are left-censored ($y_{ij}^* \in (-\infty, 0]$) if $y_{ij} = 0$, and observations are right-censored ($y_{ij}^* \in [\$10, \infty)$) if $y_{Fj} = y_{Gj} = \$10$. If $y_{ij} = \$5$, then $y_{ij}^* \in [\$5, n]$. If $y_{ij} = \$10$ and either $y_{Fj} < \$10$ or $y_{Gj} < \$10$, then $y_{ij}^* \in (n, \$10]$. The value of n is set at 7.5; varying the value of n between 5 and 10 makes no substantial difference to the results. The model is fitted using the *xtintreg* command in Stata 11.