

# The size and distribution of donations: Effects of number of recipients

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## Abstract

Whereas much literature exists on “choice overload”, less is known about effects of numbers of alternatives in donation decisions. We hypothesize that donations increase with the number of recipients, albeit at a decreasing rate, and reflect donors’ knowledge of the recipients. Donations involve different concepts of fairness—equity and equality—and these can interact with numbers of alternatives. In two experiments, respondents indicated how they would donate lottery winnings of 50 Euros. Results showed, first, that more was donated to non-governmental organizations and campaigns that respondents knew better. Second, total donations increased with the number of recipients albeit at a decreasing rate. Third, when limited to giving to only one of multiple alternatives, donors gave less than when this restriction did not apply. Fourth, variability of donations can both increase and decrease with the number of potential recipients. We comment on theoretical and practical implications as well as suggesting issues for future research.

Keywords: choice overload, donation decisions, fairness, equality, equity.

## 1 Introduction

Recently, much literature has highlighted the importance of numbers of alternatives in choice. This can be considered from two perspectives. In one, investigators have reported effects when people make unique selections from different numbers of alternatives (e.g., Iyengar & Lepper, 2000; Schwartz, 2004; Scheibehenne, Greifeneder & Todd, 2010). For example, studies have documented differential satisfaction with choice for decisions involving pens (Shah & Wolford, 2007), pension plans (Iyengar, Huberman & Jiang, 2004), gift boxes (Reutskaja & Hogarth, 2009), and wines (Bertini, Wathieu & Iyengar, 2010). Moreover, a recent meta-analysis suggests that the magnitude of effects depends on preconditions, choice moderators and the contexts in which decisions are made (Scheibehenne, Greifeneder & Todd, 2010).

The focus in the second perspective is on what happens when people allocate resources across different numbers of alternatives (e.g., Andreoni, 2007). This is the topic of the present paper. Specifically, we consider this issue in the context of charitable donations and investigate the effects of numbers of alternatives on the amount of

total donations as well as their distribution across charitable organizations (NGOs, non-governmental organizations) and specific campaigns. Both of these issues are important from theoretical and practical viewpoints. For example, when attempting to maximize donations, NGOs might consider whether donors perceive them as belonging to small or large subsets of potential recipients. At the same time, NGOs often seek funds for different campaigns and it is important to know how the number and presentation of campaigns affect total donations.

We report two experiments. In the first, we explore effects when donors allocate funds across different numbers of NGOs. In the second, we investigate what happens when a single NGO solicits contributions for different numbers of campaigns. In short, we find two effects of increasing the number of alternatives: total contributions increase albeit at a decreasing rate; and distributions of donations are affected. Specifically, these tend to become less egalitarian in the case of NGOs but more so in the case of campaigns. In the second experiment, we also investigate the use of “drop down” menus in donation interfaces for soliciting donations to specific campaigns. When, as in current practice, choice is limited to one of several alternatives, contributions are lower than when this restriction does not apply. We conclude by discussing implications.

### 1.1 Relevant literature

Several recent studies have focused on different aspects of the donation process including determinants of dona-

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tion decisions (Landry et al., 2006; Chang, 2005), the impact of presentation mode (Small, Loewenstein & Slovic, 2007), the effect of social interactions (Schweitzer & Mach, 2008), herding behavior among donors (Martin & Randal, 2008) and methodologies for measuring altruistic behavior (Bekkers, 2007).

Andreoni (2007) specifically examined the effects of numbers of recipients on donations in the context of an experimental economics game. He found that, as the number of recipients increased, participants gave more but that individual shares decreased. Specifically, for “the average subject, a gift that results in one person receiving  $x$  is equivalent to one in which  $n$  people receive  $x/n^{0.68}$  each” (Andreoni, 2007, p. 1731).

A number of studies have shown that these kinds of results are sensitive to emotionally charged stimuli. For example, Hsee and Rottenstreich (2004) compared the effects of affect-rich as opposed to affect-poor stimuli to capture willingness to donate to saving from one to four endangered pandas. With affect-poor stimuli (dots), willingness to donate was greater for four endangered pandas than one. With affect-rich stimuli (cute pictures), however, there was no difference. (But Gong & Baron, 2011, failed to find such an interaction with similar cases.)

Related phenomena have been reported by Kogut and Ritov (2005a; 2005b). They have identified conditions under which people give more to help single individuals in need than to groups of individuals with the same needs (see also, Dickert, Kleber, Peters, & Slovic, 2011). The key is providing specific information about the single individual (e.g., name and a picture) and eliciting judgments in separate as opposed to joint evaluation mode (Hsee et al., 1999).

The phenomenon that emotional responses are greater toward individual victims as opposed to aggregates has been termed the “collapse of compassion” and raises the issue of why and how it occurs. Cameron and Payne (2011) note that most studies demonstrating this phenomenon have been conducted within the context of donation decisions, and they argue that the collapse is not because people lack feelings about larger numbers. Instead, large numbers cue people to regulate their emotions, particularly when they are motivated to do so (e.g., when money is at stake). Cameron and Payne (2011) go on to provide experimental evidence consistent with their hypothesis.

Two recent studies analyzed the effects of numbers of options on altruistic behavior without manipulating emotions. Scheibehenne, Greifeneder and Todd (2009) conducted an experiment involving charitable institutions while studying possible moderators of choice overload. Specifically, participants (mainly students) were endowed with 1 Euro and had to decide either to donate it all to one institution they could choose from a specified

list or to keep the money for themselves. Their findings suggest that more choices (represented by longer lists) increase the proportion of donors. In addition, people are more likely to give to charities that are better known. Note, however, that this study did not address the issue of allocating donations across alternative charities or multiple campaigns offered by one institution. Carroll, White and Pahl (2011) studied effects on people’s choices of the number of alternative opportunities for volunteer work. They found adverse effects of more choice in that decisions to defer commitment were greater when there were more alternatives.

As in the above two studies, we do not make use of emotional stimuli in our work but (with one exception) we do not limit choices to one of several alternatives.

## 1.2 Hypotheses

In conceptualizing how donors’ decisions are affected by numbers of potential recipients, we consider three issues. First are effects due to knowledge about the recipients.<sup>1</sup> Second, we consider the impact of numbers of potential recipients. And third, we speculate on how the number of alternatives changes the distributions of donations across recipients.

We hypothesize that donations made to specific NGOs or campaigns increase with knowledge about them (see also Scheibehenne, Greifeneder & Todd, 2009). This leads to:

*H1.* Recipients that are better known receive more donations.

When considering the impact of numbers of potential recipients, three points are important. First, donations are limited in that donors face budget constraints. Second, we assume that the utility donors obtain from giving increases with the size of donations but at a decreasing rate (Andreoni, 2007). Third, we hypothesize that decisions to make donations are sensitive to perceived needs of recipients. Thus, factors that signal perceived need are important. One such factor is the number of potential recipients. Our rationale is simple. If a single NGO is seeking funds for a specific cause, that cause might be seen as important and worthy of support. However, if several NGOs are seeking funds for the same (or similar) cause, the need will be perceived as greater. For campaigns, similar reasoning applies; the larger the number of campaigns offered by an NGO, the larger the perceived need.<sup>2</sup> These points can be summarized by our second hypothesis:

<sup>1</sup>By knowledge we mean how much a person is aware of the existence of the recipient, be it an NGO or campaign.

<sup>2</sup>Saying that perceived need is a function of numbers of NGOs or campaigns begs the interesting question of how potential donors perceive specific sets of NGOs (or campaigns). This issue, however, is beyond the scope of the present research.

*H2.* Donations increase with the number of potential recipients, but at a decreasing rate.

To explore the relation between number of recipients, perceived need, and donations, we conducted a preliminary study with undergraduate students at Universitat Pompeu Fabra. (Our main experiments involve participants from the general public in Spain.) In a survey, 40 participants were asked to imagine that they could distribute the resources of 100 NGOs to deal with four disasters. These disasters had different levels of devastation and each NGO could only deal with one disaster. For each of the four cases, the level of devastation was provided through information on casualties, homelessness and economic damages such that participants had a clear sense of the need for help. The participants assigned a higher number of NGOs to cases where the need was higher, consistent with the notion that perceived need is positively related to the number of NGOs. In a second survey, 35 participants hypothetically distributed 100 Euros across the same four disasters. The amounts donated to disasters increased with level of devastation (i.e., need), but at a decreasing rate.

Finally, how are donations distributed across potential recipients? We assume that donors seek to be fair, but in doing so they implicitly deal with two different concepts of fairness. In one, allocations reflect the relative merits of recipients. This is known as the “equity” rule. Second, although equity is sometimes assumed to guide judgments of fairness, people are also sensitive to considerations of “equality”. That is, a rule whereby all recipients receive equal allocations (Sarbaugh, Dar & Resh, 1994; Hertwig, Davis & Sulloway, 2002).

Indeed, Baron and Szymanska (2010) argue that if people know that one NGO makes more efficient use of its resources than all the others, then donors would be justified in allocating all their donations to that NGO. However, people are reluctant to do this and there is a diversification bias whereby donations are distributed more equally.

How do donors reconcile the competing claims of equity and equality as the number of alternatives increases? We suggest that two factors are important. One is that allocations reflect perceptions of differential merit. The second concerns the relative appeal of the equality principle as the number of alternatives increases and for this we envisage two possibilities: either the equality principle becomes less important as the number of alternatives increase; or, on the contrary, it becomes more important. A priori it is not clear which is correct. It may be that the equality principle is difficult to ignore when there are few alternatives. At the same time, the equality principle may be easier to implement when there are many alternatives. As a consequence, we state competing hypotheses:

*H3a.* The distribution of donations becomes less egalitarian across potential recipients as their numbers in-

crease (i.e., the variability of donations increases).

*H3b.* The distribution of donations becomes more egalitarian across potential recipients as their numbers increase (i.e., the variability of donations decreases).

We have no objective measures of donors’ judgments of merit. Thus in our experimental work we use knowledge of the NGOs and campaigns as a proxy assuming, in effect, that donors assess merit using the recognition heuristic (Goldstein & Gigerenzer, 2002).

Our two experiments aim to test the three hypotheses. The first involves conditions with varying numbers of NGOs; the second considers different numbers of campaigns offered by a single NGO.

## 2 Experiment 1: Number of NGOs

### 2.1 Participants, design, and procedure

Participants were members of the general public in Spain enrolled in an online market research panel. Fifty-four percent of the 145 respondents were female and the mean age was 35 (median 34, minimum 15, and maximum 69). Most participants had at least a university degree.

At the beginning of a 40-minute market Web survey on an unrelated topic, they were informed that, in addition to the fixed remuneration for their participation, they had been entered in a lottery and had the chance of winning 50€ (expressed as 500 points) at the end of the session. Once the survey ended, they were notified that, if they wished, they could donate as much as they wanted of their lottery winnings (from 0 to 500 points) to certain specified NGOs, split between recipients in any way they desired. The online setup guaranteed anonymity of responses. After making their choices, one person was to be chosen at random and given the extra 50€, less the amount of her/his donations. Thus, if the winner of the lottery donated 0, s/he would get to keep 50€; if s/he donated, say, 30€, s/he would get to keep 20€. The money donated would go to precisely those NGOs specified by the winner.

The names of the NGOs were provided along with the information that their common agenda is to aid underprivileged children. The respondents were allocated at random to three groups where they faced an alphabetical list of:

- 3 NGOs (condition NGO\_3 with 54 respondents)
- 8 NGOs (condition NGO\_8 with 43 respondents)
- 16 NGOs (condition NGO\_16 with 48 respondents)

The specific NGOs were selected after searching in the internet and popular media for international organizations with a charity agenda involving underprivileged children. The names of NGOs presented in these three conditions

are shown in Table 1, in the order in which they were listed.

After making their decisions, respondents rated all 16 NGOs by indicating how much they knew about each prior to the experiment as follows: “0” implied that they had not heard of it, “1” that they had heard of it, “2” that they knew it, and “3” that the NGO is “very famous”. Only six respondents claimed to have heard of all 16 NGOs and four of the 16 NGOs received average ratings greater than 1 on what we call the “knowledge score”. These data suggest that 16 NGOs represented a large choice set.

## 2.2 Results

Table 2 lists the different NGOs in the order of their mean popularity scores that are indicated on the right hand side of the table. Here we also report the proportions of participants who stated that they had never heard of the respective NGOs. Four NGOs are quite well known whereas the other twelve are largely unknown. These results make sense within the Spanish context of the study. Unicef, for example, has a sponsorship deal with the Barcelona Football Club that is very popular in the region where the study took place. Mercy Corps, on the other hand, is not well known within Spain.

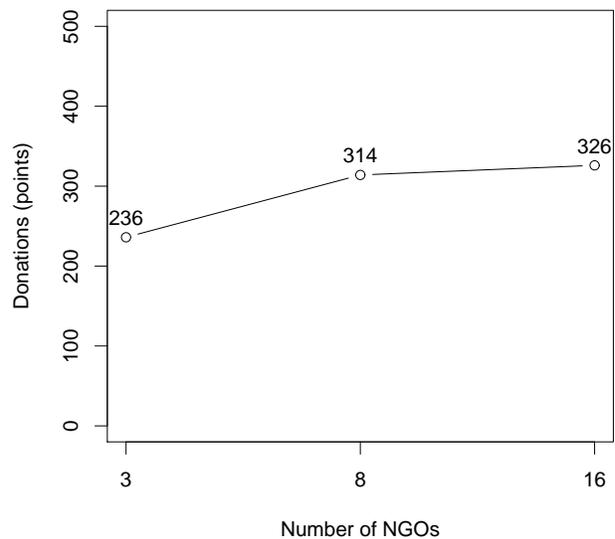
The intermediate columns of Table 2 show the mean donations in points in the three experimental conditions.

Results in Table 2 support hypothesis *H1* at an aggregate level. Mean knowledge scores of the NGOs correlate (in an ordinal sense) with mean donations (the better known NGOs receiving larger contributions). Spearman’s rho is 1.00 for NGO\_3; 0.64 ( $p = .10$ ) for NGO\_8; and 0.47 ( $p = .07$ ) for NGO\_16.

To estimate the effect of knowledge at the level of individual donations, we regressed individual donation decisions ( $n = 1274$ ) on knowledge scores. Controlling for individual NGO effects, number of alternatives and adjusting the standard errors for clusters of 145 different donors, we obtain a statistically significant coefficient of 17.1 ( $s.e. = 2.9, p = .001$ ) for the knowledge score. The F-ratio of the analysis is  $F(16, 144) = 18.6$ , with  $p = .001$ ,  $R^2 = .25$  and  $root-MSE = 71.7$ . These results indicate that both at the aggregate and individual levels, better known recipients obtain larger contributions.

Our second hypothesis (*H2*) is that, overall, donations increase with the number of recipients but at decreasing rate. Figure 1 shows mean donations as a function of experimental conditions. An analysis of variance indicates that the effect of number of alternatives on donations is significant ( $F(2, 142) = 2.98, p = .05$ ). When we look at pairwise contrasts and effect sizes between the mean donations, we find that the mean in condition NGO\_8 is

Figure 1: Mean donations in the three conditions in Experiment 1.



greater than in condition NGO\_3 (314 vs. 236,  $z = 1.91, p = .06$ , Cohen’s  $d = .52$ ); and the mean in condition NGO\_16 at 326 is also greater than in condition NGO\_3 ( $z = 2.23, p = .03$ , Cohen’s  $d = .54$ ). Finally, the difference between the means for condition NGO\_16 and NGO\_8 is not statistically significant with a medium effect size (326 vs. 314,  $z = 0.3, p = .78$ , Cohen’s  $d = .42$ ). Post-hoc multiple comparisons through Tukey’s HSD test find only a difference between the means for NGO\_16 and NGO\_3 ( $q = 3.08, p = .08$ ).

Further evidence that donations increase with the number of potential recipients can be seen in Table 3 where we provide data characterizing individual contributions. As the number of potential recipients rises, so does the proportion of participants who donate their total endowment of 500 points—from 24% (NGO\_3) to 37% (NGO\_8) to 50% (NGO\_16). (The difference between NGO\_16 and NGO\_3 is significant,  $z = 2.8, p = .01$ ). Moreover, note that whereas 30% of participants donate nothing when there are only three NGOs, this figure drops to 19% for the cases with 8 and 16 alternatives.

Hypotheses *H3a* and *H3b* make contrary predictions—increasing as opposed to decreasing variability in donations as the number of alternatives increases. At the aggregate level, the variances of the contributions to the different NGOs are 582, 1556 and 1549 in conditions NGO\_3, NGO\_8, and NGO\_16, respectively. The F-tests for the difference in variances between NGO\_3 and NGO\_16 ( $F(15, 2) = 2.67, p = .30$ ) and between NGO\_3 and NGO\_8 ( $F(7, 2) = 2.67, p = .30$ ) indicate that the change in the variability of donations is not significant. Moreover, an analysis of variance on variances of dona-

Table 1: NGO options across conditions in Experiment 1.

NGO_3	NGO_8	NGO_16
Mercy Corps	Children’s Network International	Care
Oxfam	Every Child	Children in Crisis
Unicef	Global Fund for Children	Children’s Network International
	Mercy Corps	EveryChild
	Oxfam	Global Fund for Children
	Stop Child Poverty	Médecins Sans Frontières
	Unicef	Mercy Corps
	United Children’s Fund	Oxfam
		Plan International
		Serving Our World
		Save the Children
		SOS Kinderdorf International
		Stop Child Poverty
		Unicef
		United Children’s Fund
		World Emergency Relief

tions by individuals shows that the effect of number of available NGOs on the variance of donations is again not significant ( $F(2, 142) = 1.54, p = .22$ ).

On the other hand, in terms of the distribution of donations, in condition NGO\_3, all potential recipients receive substantial donations. In condition NGO\_8, four (or 50%) receive 76% of the contributions, and in condition NGO\_16, four (or 25%) receive 92% of the contributions. These overall trends are also supported by the data summarized in Table 3; whereas 24% of participants adopt the strategy of giving the same non-zero amounts to all participants when there are three NGOs, this figure is zero for the case with 16 NGOs. These latter results are consistent with the hypothesis that the variability of donations is positively related to the number of NGOs.

Finally, it is of interest to note how changes in the number of alternatives affect the fortunes of different NGOs. When there are only three NGOs, Mercy Corps receives a large average donation despite being unknown. However, this changes dramatically as the number of alternatives increases. Unicef, on the other hand, retains its leading position, its relative share and its donation in absolute terms as the number of alternatives increases. Oxfam sees reductions in donations as the number of alternatives increases. However, being known appears to save Oxfam from the extreme reductions from which Mercy Corps suffers as the number of alternatives increases.

### 3 Experiment 2: Number of campaigns

Experiment 2 was designed to replicate the results of Experiment 1. However, it involved varying numbers of campaigns instead of varying numbers of NGOs.

#### 3.1 Participants, design, and procedure

The design and procedure of this second study were analogous to Experiment 1. The respondents, who were entered in a 50€ lottery (expressed as 500 points) after participating in an unrelated survey, were notified that they could make a donation (of between 0 and 500 points) if they wished at the end of the session. The participants were again members of the general public in Spain enrolled in a market research panel. Fifty percent of the 505 respondents were female and the mean age was 38 (median 38, minimum 18, and maximum 74). Most participants had at least a university degree.

Unlike participants in Experiment 1, who had to decide among charitable institutions, participants in this study faced different numbers of campaigns offered by a single, well known NGO: Unicef. The study had a between-subject design involving five conditions to which respondents were allocated at random. Three conditions involved different numbers of campaigns (1, 7, and 13) and the two further conditions varied the number of op-

Table 2: Donation decisions by knowledge and number of alternatives in Experiment 1.

NGOs	Mean donations in points (stdev)			Mean knowledge score	Knowledge score = 0 (%)
	NGO_3	NGO_8	NGO_16		
Condition					
N	54	43	48		
No. of NGOs	3	8	16		
Unicef	100 (97)	128 (163)	142 (181)	2.59	3
Médicins Sans Frontières	x	x	79 (157)	2.30	8
Oxfam	83 (80)	67 (118)	52 (102)	2.01	14
Save the Children	x	x	29 (53)	1.32	34
Global Fund for Children	x	26 (46)	0 (2)	0.44	75
Mercy Corps	53 (65)	16 (25)	0 (2)	0.39	78
Plan International	x	x	0 (2)	0.39	77
United Children’s Fund	x	18 (28)	2 (14)	0.37	76
SOS Kinderdorf International	x	x	9 (39)	0.24	84
Children’s Network International	x	17 (27)	1 (7)	0.21	84
Serving Our World	x	x	3 (15)	0.21	86
Stop Child Poverty	x	25 (51)	3 (15)	0.20	87
EveryChild	x	18 (28)	1 (7)	0.19	88
Care	x	x	0 (2)	0.17	86
World Emergency Relief	x	x	3 (15)	0.17	88
Children in Crisis	x	x	1 (7)	0.16	87
Total	236	314	326		

tions that could be chosen when there were 7 and 13 campaigns. Specifically, in the former respondents could donate to only one of several options (from 7 or 13), whereas in the latter they could distribute their contributions across several options (out of 7 or 13).

In summary, there were five groups, each with 101 respondents, facing lists of:

- 1 campaign (condition Only\_1)
- 7 campaigns (condition Single\_7; campaigns were listed in a drop down menu, where donations could only be made to a single option)
- 13 campaigns (condition Single\_13; campaigns were listed in a drop down menu, where donations could only be made to a single option)
- 7 campaigns (condition Multiple\_7; campaigns were listed in an open menu where donations could be distributed across multiple options)
- 13 campaigns (condition Multiple\_13; campaigns were listed in an open menu where donations could be distributed across multiple options)

The difference between conditions Single\_7 and Multiple\_7, and conditions Single\_13 and Multiple\_13, lies in how the options are displayed. In all the online sites of Unicef and the majority of NGOs featuring multiple campaigns, the alternatives are exclusively listed in a drop down menu (analogous to conditions Single\_7 and Single\_13). Hence contributors are constrained to make a selection from a list and to donate to a single recipient, that is, without being able to distribute their donations across alternatives (unless they revisit the site). We included Multiple\_7 and Multiple\_13 in order to observe whether the elimination of this constraint would encourage donors to distribute their contributions over multiple campaigns and thus change the distribution and, more importantly, the amount of contributions. As will be shown below, this change does have an impact.

The specific campaigns were selected following a survey of Unicef’s campaigns in its 36 national websites in April 2011 (campaign compositions change depending on the occurrence of disasters). The campaigns presented in these five conditions are shown in Table 4. In

Table 3: Proportions of donation behavior in Experiment 1.

	NGO_3	NGO_8	NGO_16
% of participants giving equal non-zero amounts	24	23	0
% of participants giving away 0 points	30	19	19
% of participants giving away all 500 points	24	37	50

Table 4: Unicef campaigns across conditions in Experiment 2.

Only_1	Single_7 & Multiple_7	Single_13 & Multiple_13
Unicef (where most needed)	Where most needed	Where most needed
	Haiti, after one year	Haiti, after one year
	Emergency fund	Emergency fund
	Floods in Pakistan	Floods in Pakistan
	Libyan crisis	Libyan crisis
	Earthquake and tsunami in Japan	Earthquake and tsunami in Japan
	Water for Niger	Water for Niger
		United against hunger
		Fight against malaria
		Clean drinking water
		Children’s education
		Humanitarian aid for Sudan
		Promotion of Unicef

condition Only\_1, participants were asked if they would consider donating to Unicef (without mentioning a specific campaign), who then would decide how to use the contributions. In all the other conditions, the option “where most needed” was featured at the top of the options list, whereas the remainder of campaigns were displayed in an order randomized for each participant. (This structure mimics donation sites that feature multiple options.) The campaigns in conditions Single\_7 and Multiple\_7 were the ones available in Unicef’s Spanish site ([www.unicef.es](http://www.unicef.es)) in April 2011, whereas the six additional campaigns featured in Single\_13 and Multiple\_13 are among those that are frequently featured in Unicef’s other national sites.

The number of alternatives featured in different conditions is consistent with the current available numbers of options offered by Unicef and many other NGOs. Specifically, as of April 2011, across all websites where one can make a one-time donation to Unicef, the mean number of campaigns from which to choose is 7 ( $SD = 12.8$ ). When the German site is excluded (this site offers an unusually large number of 72 alternative campaigns), this figure drops to 5 ( $SD = 4.5$ ). One third of these sites offer only

one alternative (denoted as “where most needed”), and only 15% feature more than 10. Hence, while condition Only\_1 mimics the majority of situations encountered in online environments, conditions Single\_7 and Multiple\_7 represent average situations across all sites. Given current practice, conditions with 13 choices (e.g. conditions Single\_13 and Multiple\_13) constitute a valid analogy for large sets of alternatives.

As in Experiment 1, after making their donation decisions, respondents rated all 12 campaigns (excluding “where most needed”) by indicating how much they knew about each prior to the experiment as follows: “0” implied that they had not heard of it, “1” that they had heard of it, “2” that they knew it, and “3” that the campaign is “very well known”.

### 3.2 Results

In Table 5, the different Unicef campaigns are listed in the order of their mean knowledge scores that are indicated in the column on the right hand side of the table. Here, we again report the proportions of participants who stated that they had never heard of the respective cam-

Table 5: Donation decisions by knowledge and number of alternatives in Experiment 2.

Unicef campaigns	Mean donations in points (stdev)					Mean knowledge score	Knowledge score = 0 (%)
	Only_1	Single_7	Single_13	Multiple_7	Multiple_13		
<i>Condition</i>							
<i>N</i>	101	101	101	101	101		
<i>No. of campaigns</i>	1	7	13	7	13		
Where most needed	149 (148)	102 (149)	74 (142)	120 (158)	93 (146)	2.59*	3
Japan earthquake/tsunami	x	19 (64)	13 (56)	28 (67)	18 (52)	1.55	13
Haiti, after one year	x	35 (103)	5 (39)	27 (65)	16 (45)	1.24	20
United against hunger	x	x	20 (85)	x	23 (53)	1.15	23
Fight against malaria	x	x	0 (0)	x	11 (25)	1.11	23
Children's education	x	x	22 (73)	x	20 (53)	0.99	33
Libyan crisis	x	5 (50)	0 (0)	10 (23)	4 (13)	0.93	41
Clean drinking water	x	x	19 (77)	x	18 (38)	0.84	42
Promotion of Unicef	x	x	19 (85)	x	27 (94)	0.70	53
Emergency fund	x	16 (55)	1 (10)	20 (61)	9 (23)	0.67	52
Sudan humanitarian aid	x	x	0 (0)	x	6 (17)	0.59	55
Floods in Pakistan	x	0 (0)	0 (0)	11 (24)	5 (12)	0.53	60
Water for Niger	x	12 (62)	5 (33)	11 (23)	5 (17)	0.28	79
<b>Total</b>	149	188	179	227	255		

\* The knowledge score for the option “where most needed” was taken from Experiment 1, knowledge score of Unicef.

paings. The campaign “where most needed” has been assigned the knowledge score of Unicef from Experiment 1. Among other campaigns, our participants were relatively more knowledgeable about two recent (as of April 2011) and highly publicized specific disasters (Japan and Haiti) and two general causes (eradication of hunger and malaria).

The intermediate columns of Table 5 show the mean donations in points for the five experimental conditions.

Results support *H1* at an aggregate level. As in Experiment 1, the mean knowledge scores of the campaigns correlate (in an ordinal sense) with mean donations (the better known campaigns receiving larger overall contributions). Spearman's rho is .79 ( $p = .05$ ) for both Single\_7 and Multiple\_7; .49 ( $p = .08$ ) for Single\_13; and .63 ( $p = .03$ ) for Multiple\_13.

To identify the effect of knowledge at an individual level, we regressed individual donation decisions (excluding the ones made for “where most needed”, which lacks the individual knowledge score) on knowledge scores ( $n = 3636$ ). Controlling for campaign effects, number of alternatives and presence of a drop down

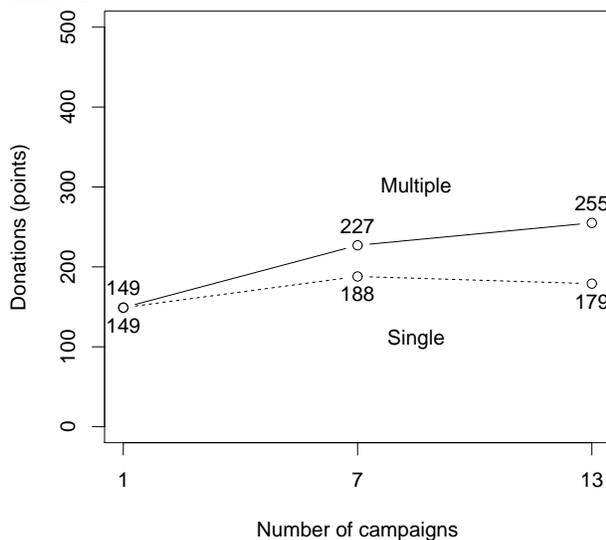
menu, and adjusting the standard errors for clusters of 404 different donors, we obtain a statistically significant coefficient of 7.1 ( $s.e. = 1.15, p = .001$ ) for the knowledge score. The F-ratio of the analysis is  $F(14, 403) = 12.0$ , with  $p = .001, R^2 = .04$  and  $root-MSE = 50.3$ . These results suggest that both at the aggregate and individual levels, better known campaigns obtain larger contributions.

The results are in line with *H2*. Figure 2 shows mean donations as a function of experimental conditions. Visually, this suggests a main effect for the Multiple as opposed to the Single conditions (the means for the former being larger than those of the latter). A two-way factorial analysis of variance shows that both number of alternatives and drop down menus have significant impacts on donations ( $F(4, 500) = 6.52, p = .001$ ). The effect of number of alternatives yields an F-ratio of  $F(2, 500) = 10.78$  with  $p = .001$ , and the ratio for the effect of drop down menu is  $F(1, 500) = 12.01$  with  $p = .001$ . The interaction effect is not significant. Post-hoc multiple comparisons using Tukey's HSD test reveal that the donations to Multiple\_7 and Multiple\_13 are higher than Only\_1 ( $q = 4.8$  with  $p = .001$  and  $q = 6.5$  with  $p = .001$ , respectively).

Table 6: Proportions of donation behavior in Experiment 2.

	Only_1	Single_7	Single_13	Multiple_7	Multiple_13
% of participants giving equal non-zero amounts	x	x	x	6	4
% of participants giving away 0 points	31	22	26	20	15
% of participants giving away all 500 points	8	9	10	22	18

Figure 2: Mean donations in the five conditions in Experiment 2.



In terms of specific pairwise contrasts and effect sizes, we find that when participants were constrained to select a single option, the mean donation in condition Single\_7 is greater than in condition Only\_1 (188 vs. 149,  $z = 1.9$ ,  $p = .06$ , Cohen's  $d = .27$ ). The mean for condition Single\_13 at 179 is not statistically different than those for Only\_1 and Single\_7. However, when the mean for condition Only\_1 is compared with those for conditions Multiple\_7 (227) and Multiple\_13 (255), the differences are significant with larger effect sizes ( $z = 3.3$ ,  $p = .001$ , Cohen's  $d = .47$  and  $z = 4.7$ ,  $p = .001$  Cohen's  $d = .67$  respectively). Given the structural similarity of these conditions to NGO\_3, NGO\_8 and NGO\_16, these last results echo the findings of Experiment 1.

The effect of allowing donors to distribute their contributions over the available options can be further observed in Table 6 where we provide data characterizing individual contributions. Similar to Experiment 1, as the number of potential recipients rises, so does the proportion of participants who donate their total endowment of 500 points—from 8% (Only\_1) to 22% (Multiple\_7) and 18% (Multiple\_13). (The difference between Multiple\_7 and Only\_1 is significant,  $z = 2.8$ ,  $p = .01$  and so is the

difference between Multiple\_13 and Only\_1,  $z = 2.2$ ,  $p = .03$ ). Moreover, note that whereas 31% of participants donate nothing when there is only one option, this figure drops to 20% and 15% for the cases with 7 and 13 Multiple alternatives (the difference is significant for conditions Only\_1 and Multiple\_13,  $z = 2.73$ ,  $p = .01$ ).

The data of Experiment 2 appear to reject *H3a*, the hypothesis that the variability of donations increases with numbers of alternatives. At the aggregate level, the variances of the contributions to the different campaigns are 1209, 403, 1548 and 538 in conditions Single\_7, Single\_13, Multiple\_7 and Multiple\_13, respectively. The F-tests for the difference in variances between Single\_7 and Single\_13 ( $F(6, 12) = 3.00$ ,  $p = .05$ ) and between Multiple\_7 and Multiple\_13 ( $F(6, 12) = 2.88$ ,  $p = .06$ ) indicate that the variability of donations decreases as the number of alternatives increases thereby supporting *H3b*. Moreover, a two-way factorial analysis of variance on variances of individuals' donations shows that the negative effect of number of available campaigns on the variance of donations is again significant ( $F(1, 400) = 15.84$ ,  $p = .001$ ), whereas neither the effect of using a drop down menu, nor the effect of the interaction term is significant.

In terms of the distribution of donations, each campaign, including the option “where most needed”, suffers reductions in both absolute terms and in shares within total donations as the number of alternatives increases.

## 4 Discussion

We conducted two experiments that investigated effects on charitable donations when these are allocated to varying numbers of recipients. The tasks in our experiments differed in two ways. In one, recipients were different NGOs; in the other, recipients were different campaigns of the same NGO. Unlike the former, the latter also involved conditions that limited donors to allocating their whole donation to one of several recipients.

We hypothesized that better known recipients would receive more donations than lesser known recipients (*H1*). We showed this to be the case in both Experiment 1 and 2 at the aggregate as well as individual levels.

To measure knowledge of NGOs and campaigns, we explicitly adopted a simple strategy of only asking our

respondents whether they had heard of these (on a scale from “not having heard” to “well known”). We did not inquire about the nature of respondents’ knowledge or attitudes. Moreover, we used knowledge scores as a proxy for respondents’ assessments of the merits of NGOs and campaigns (appealing to the recognition heuristic, Goldstein & Gigerenzer, 2002). Clearly, however, the fact that a respondent is knowledgeable about an NGO does not necessarily imply a positive attitude. It would be appropriate to elicit knowledge in a more complete manner in future research.

One intriguing finding was the apparent interaction between knowledge and number of potential recipients as the latter increases. Consider the donations made in Experiment 1 to the three NGOs in condition NGO\_3, namely Unicef, Oxfam, and Mercy Corps. In condition NGO\_3, two well-known NGOs, Unicef and Oxfam, receive large mean donations (100 and 83), and even the little known Mercy Corps receives 53. As the numbers of recipients increase, Unicef—the best known NGO—maintains its share of total donations (some 40%) and so benefits in absolute terms as overall donations grow. On the other hand, both Oxfam and Mercy Corps see reductions. In the case of Mercy Corps, the drop-off is dramatic: from 53 (NGO\_3) to 16 (NGO\_8) to 0 (NGO\_16).

The data of both experiments support our second hypothesis that donations increase with the number of potential recipients, but at a decreasing rate. In Experiment 1, there is a 33% increase in mean donations as the number of recipients increases from three to eight (236 to 314), and a 38% increase from three to 16 (236 to 326). In the Multiple condition of Experiment 2, the increase from a single recipient to seven is 52% (149 to 227), and 71% from the single to 13 recipients (149 to 255). These are important results from both theoretical and practical perspectives.

One of the rationales underlying *H2* is that the presence of recipients is a cue to need and that respondents are sensitive to this. Indeed, the results of our two surveys with undergraduate students suggested that there is a relation in people’s minds between need and numbers of NGOs. However, we neither measured nor manipulated need independently in our experiments and thus cannot rule out the possibility that some other explanation drives the increases in donations that we observed. On the other hand, our assumption that people gain more utility from being more generous is similar to that of Andreoni (2007) who—subject to one exception—observed behavior similar to our results in the setting of an experimental economics game.

Andreoni’s (2007) model predicts that, when the number of recipients increases, those recipients who are present in the different conditions each receive smaller donations (even though total donations increase). This

is precisely the pattern of results we observed in Experiment 2. However, in Experiment 1, Unicef (the best-known NGO) was an exception to the rule in that, as the number of recipients increased, so did the donations it received. It is possible that respondents view donating to NGOs differently from donating to campaigns and this possibility should be investigated in future research.

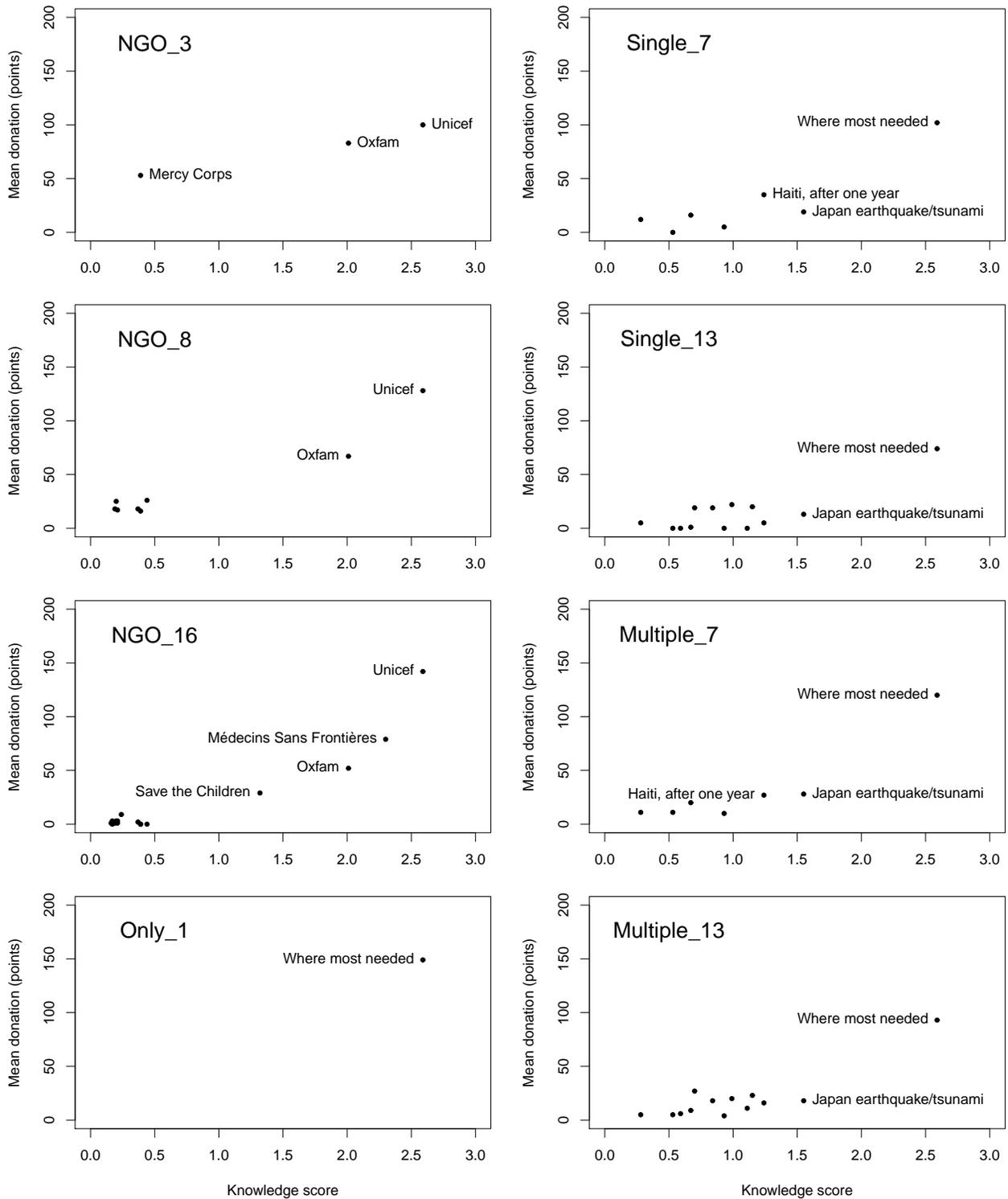
Although not explicitly related to *H2*, the finding in Experiment 2 that donations were greater when respondents could give to several recipients as opposed to being limited to a single option is important. In particular, it suggests that NGOs should consider revising the current design of the drop down menus of their online sites. Of course, one difference between our experimental set up and the online sites of NGOs is that in the Single conditions we did not allow respondents to access the list of potential recipients more than once. It is an open empirical question as to whether the procedures used by NGOs do in fact discourage potential donors from engaging in repeated interactions with drop down menus.

Hypothesis 3 considers the possibility that as the number of recipients increases so does the variability in donations. We framed this question as involving the extent to which respondents—in attempting to be fair—place more or less weight on considerations of equality as opposed to equity as numbers of recipients change. The results of Experiment 1 are ambiguous in that whereas some measures support more variance as numbers of alternatives increase, others suggest no difference. On the other hand, in Experiment 2 variance in donations decreases as the number of alternatives increases. Once again, we are led to suspect that people think differently about donations to NGOs and donations to campaigns.

Figure 3 summarizes our results by showing donation amounts across the eight experimental conditions of our two experiments. The innovation of the present work is to consider how the number of potential recipients affects donation decisions in terms of both amounts and distributions across alternatives. That there are such effects is important from both theoretical and practical viewpoints. From a theoretical perspective our approach can be described as cognitive in nature. It does not account for emotional considerations that have been shown to be important in donation decisions (Dickert, Sagara & Slovic, 2011) and that can, in turn, be mediated by individual differences such as numeracy (Dickert et al., 2011). Thus extending our work to incorporate the effects of emotional influences and individual differences is important for future research.

At a practical level, our results emphasize the importance of the reputation of NGOs and the size of the markets in which they compete for funds. If market size is captured by the number of potential recipients, then it pays for leading NGOs to seek large, competitive “mar-

Figure 3: Visualization of donations made to recipients across all eight experimental conditions, as a function of knowledge score.



kets". Lesser known NGOs, however, should avoid competition. On the other hand, featuring multiple campaigns is beneficial for resource generation, so long as donors are not constrained to a single option when making a contribution. Given that almost all NGOs employ such limitations in their current online sites and donation interfaces, our results have implications for improving processes of resource generation.

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