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Abstract

An influential result in the literature on charitable giving is that matching subsidies dominate rebate subsidies in raising funds. We investigate whether this result extends to 'unit donation' schemes, a popular alternative form of soliciting donations. There, the donors' choices are about the number of units of a charitable good to fund at a given unit price, rather than the amount of money to give. Comparing matches and rebates as well as simple discounts on the unit price, we find no evidence of dominance in our online experiment: The three subsidy types are equally effective overall. At a more disaggregate level, rebates lead to a higher likelihood of giving while matching and discount subsidies lead to larger donations by donors. This suggests that charities using a unit donation scheme enjoy additional degrees of freedom in choosing a subsidy type. Rebates merit additional consideration if the primary goal is to attract donors.

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1 Introduction

Subsidies are a common way of incentivizing charitable giving. They typically take the shape of rebates, in which a third party (e.g., the government) refunds a fraction r of the gift back to the donor; or the shape of matches, in which a third party (e.g., a generous donor) supplements each donation at a rate m, such that the charity receives a total of $(1 + m)$ times the original donation. Both rebates and matches have been extensively studied and several key findings have emerged in the literature (see Vesterlund, 2016; Epperson and Reif, 2019, for comprehensive reviews). Probably the most notable result is that although rebates and matches imply the same price of giving if the corresponding subsidy rates r and m satisfy $r = \frac{m}{m+1}$, overall donations received by the charity are higher under matches than under equivalent rebates (Eckel and Grossman, 2003, 2006a,b, 2008b, 2017; Davis et al., 2005; Lukas et al., 2010; Bekkers, 2015; Gandullia and Lezzi, 2018; Gandullia, 2019).[1] Another finding is that matching subsidies often significantly increase private contributions net of the subsidy compared to a no subsidy condition without a lead donor (e.g. Karlan and List, 2007; Gneezy et al., 2014; Huck et al., 2015; Eckel and Grossman, 2017).[2]

The literature has established these findings in a setting in which individuals are asked to decide how much money to give to a charity, arguably the most common scheme for soliciting donations. We refer to this as a *money donation* scheme. Yet another frequently applied strategy is to frame the donor's choice variable not in terms of money, but in terms of physical units of a charitable good awaiting funding. A prominent example that has attracted about one million donors from all over the world is *ShareTheMeal*, a smartphone app and initiative of the UN World Food Programme, which is used to provide food to

[1]In this literature, rebates are realized without any delay. If a delay is involved (as is the case for tax deductions), time preference need to be considered.

[2]There are important counterexamples to this finding, however (e.g. Eckel and Grossman, 2008b; Karlan et al., 2011).

children in need. Donors for ShareTheMeal do not directly choose an amount of money to give. Instead, they are informed that feeding one child for a day costs $0.50 and are then asked to announce the number of feeding days that they would like to fund.[3] We refer to this alternative scheme as a *unit donation* scheme.

Do the key findings about the effects of matches and rebates in money donations generalize to the alternative unit donation scheme? In this paper, we examine the effect of subsidies on unit donations by conducting an online field experiment. The 558 subjects are asked to decide how many units of a charitable good they would like to provide to a predetermined charity, funded out of their reward for answering an unrelated online survey. The decision variable is framed in quantities of nutritional packages provided for malnourished children. The unsubsidized price is $0.50 per package. In the baseline, no subsidy is offered. The main treatments differ across three subsidy types and two subsidy rates. The first type, the rebate, is offered at a rate of either 33% or 50% such that a third party refunds to the subject one third or one half of the reward she spent on nutritional packages. The second type, the match, is offered at a rate of 0.5 (1:2) or 1 (1:1) such that a third party adds a nutritional package for either every two or each package donated. The third subsidy type is novel for public goods and takes the form of a price discount of either 33% or 50%. This subsidy type is without a direct parallel in money donations.

The contribution of this paper is threefold. First, we define unit donations as a separate class of charitable donations distinct from money donations. Second, we investigate how rebates and matches perform in a setting of unit donations and compare the results to the established literature on money donations. Based on between-subjects evidence, our core result is that matches and rebates are

[3] Similar food provision campaigns are the "100 Thousand Meals" appeal of the Salvation Army Australia or the "Help with €2" campaign of Misereor, the German Catholic Bishops Organisation for Development Cooperation.

equally effective in incentivizing private net donations and in generating total charity receipts. In other words, we do not replicate the superiority of matching subsidies observed in the case of money donations. Third, we check whether, in a setting of unit donations, the discount subsidy offers an attractive alternative to these subsidy types. We find that discounts are equally effective as matches and rebates when considering net donations or charity receipts. This may well be good news for charities: In a world in which subsidy types perform equally well, charities enjoy additional degrees of freedom in campaign design. At the same time, the different subsidy types perform differently when disaggregated into the extensive and the intensive margin of giving: Rebates are more effective than matches in attracting donors, but matches result in larger donations. Under discounts, the likelihood to give is lower than under rebates, and on both margins, behavior corresponds to that under matches. We conclude that if attracting donors is a secondary objective of a fundraising campaign that uses unit donations, rebates merit additional consideration. New donors offer the possibility of an ongoing income stream for charities, since previous donors are more likely to give in the future. (Eckel and Grossman, 2008b; Landry et al., 2010).

The remainder of the paper is organized as follows. In a background section (section 2), we contrast money and unit donations, explain the mechanics of subsidizing the latter, and review the relevant literature. Section 3 describes our experimental design, followed by a presentation of our main results (section 4) and a comparison with the findings on money donations (section 5). Section 6 concludes.

2 Background

2.1 Unit vs. Money Donations

For our purposes, we define a *money donation* as a solicitation scheme in which potential donors are asked to decide how much money to give to a charity. It is arguably the most common scheme for solicting donations. Academic papers in the lineage of the now classic donation models (Bergstrom et al., 1986; Andreoni, 1988, 1989) capture its main features by generally assuming a linear production technology for the charitable public good and normalizing the per-unit price of both the private and the public good to one. In such models, the prospective donor i's choice is to divide her endowment w_i (in dollars) between private consumption x_i (in dollars) and giving g_i (in dollars) to the charitable good, G. Under a money donation scheme, therefore, the donor's choice variable g_i is denominated in terms of monetary expenditures.

By contrast, we define a *unit donation* as a solicitation scheme that frames the donor's choice variable in terms of physical units of a charitable good awaiting funding. Unit donation schemes are not only popular in food programs, such as the ones discussed above. Development aid agencies, for example, promote child sponsorships by fixing the monthly donation for the sponsorship – usually around \$35 – and prospective donors choose the number of child-months to sponsor rather than the amount of money to donate. Similarly, fundraising drives for biodiversity conservation or reforestation programs let donors indicate the number of acres or trees to fund.[4] In unit donation schemes, the price of a unit of the charitable good G is no longer implicit. Instead, the fundraiser states an explicit price p and asks how many discrete units g_i the potential donor would like to fund. In this respect, the setting resembles early models of the private

[4]For instance, in the *Monarch Butterfly Habitat Exchange* program of the Environmental Defense Fund, donors sponsor acres of milkweed habitat for \$35 per acre. In the *Plant A Tree* program of the Jewish National Fund, donors choose the number of trees to be planted at \$18 a tree.

provision of public goods that are explicit about units and prices (e.g., Warr, 1983). Under a unit donation scheme, therefore, the donor's choice variable g_i is denominated in terms of the quantity of the charitable good funded.

Although under both schemes donors eventually provide money, there are important differences between unit and money donations. First, donors' choice sets differ. Under a unit donation scheme, the units of the charitable good to be provided are typically indivisible, which introduces an element of discreteness that is largely absent in the virtually continuous money donations. Second, the information provided to prospective donors differs. By stating the per-unit price of the charitable good, unit donation schemes make statements about the charity's marginal cost of production, whereas money donation schemes frequently provide little information on the cost structure of producing the charitable good. While information on the share of fundraising and overhead costs is increasingly available to donors (Ribar and Wilhelm, 2002; Meer, 2014), information on the impact of a contribution (or the absence thereof) can substantially affect donations (Bekkers and Wiepking, 2011; Lewis and Small, 2019). Third, the framing of the choice differs. By asking for the number of physical units of the charitable good, unit donation schemes emphasize how a donation generates specific outcomes for recipients. As a result, the motive of giving to create an impact (Duncan, 2004) might become more relevant for the donation decision.

Diederich et al. (2020) compare the two donation schemes in an experimental study and show that the choice of the donation scheme significantly affects the likelihood of receiving donations. The direction of the effect depends on the size of a physical unit: A unit donation scheme attracts more donors if the unit size is small but fewer donors if the unit size is large. For the large unit size, the difference is primarily driven by the restricted choice set under the unit donation scheme.

2.2 Subsidizing Unit Donations

Subsidizing unit donations involves some small but important differences compared to subsidizing money donations. In unit donations, rebates can be applied by refunding a fraction of the donor's provision costs back to the donor. If, for example, a unit of the charitable good costs \$0.50 and a 50% rebate is offered, the donor receives \$0.25 back for each unit funded. Matches can be applied to unit donations by providing supplementary units of the charitable good. If, for example, a 1:1 match is offered for tree plantings, the third party funds one additional tree for each tree funded by the donor. Due to the indivisibility of units, matching payments by the third party are restricted to complete units of the charitable good. This introduces some discontinuity in the matching payment if the matching rate is not an integer: For example, at a matching rate of 0.5 (1:2) every second tree funded by the donor induces one tree funded by the third party. However, for a donation of only one tree, there is no additional funding by the third party. This is in contrast to the continuous choice in money donations, in which the matching rate typically applies to any arbitrary amount in the same way (i.e. at a matching rate of 0.5, a donation of any dollar amount induces a matching payment of 0.5 times this amount).

The transferability of results from money to unit donations is therefore not only a matter of framing effects: When matches consist of supplementary units and rebates are refunded costs, then rebates and matches are also no longer theoretically equivalent. This is particularly evident at the extensive margin of becoming a donor: The smallest positive donation is to fund one unit of the charitable good. Given a unit price p, this implies a minimum expense of p required under matches. In contrast, rebates provide a refund on the donation given and, at subsidy rate of r, the cost of becoming a donor is $p(1-r) < p$. As a result, rebates are potentially more effective in attracting donors. An additional difference comes into play when subsidy rates take non-integer values:

The change in the matching payment due to a one unit increase in the donation depends on the donation level. In contrast, under rebates any increase in the donation proportionally increases the subsidy payment, as is the case for both subsidy types under money donations. In sum, there are not only structural differences between money and unit donations; there are also reasons to expect that subsidies perform differently under the two schemes.

In our experiment, we additionally consider a third subsidy type, price discounts, that is not found in money donations. In a unit donation scheme, each physical unit of the charitable good is associated with an explicit price. This allows a price discount of rate d to be offered such that the subject faces an effective price of $p(1-d) < p$, complemented with information about how the price comes about. If, for example, a unit of the charitable good costs \$0.50 and a 50% discount is offered, the donor can fund one unit at a price of \$0.25 while being informed that the gap to the non-discounted price will be provided by the third party. Discounts are theoretically equivalent to rebates, but two small differences exist. First, rebate subsidies are paid to the donor whereas discount subsidies are paid to the charity. Second, in comparison to both matches and rebates, discounts obviate the need for donors to calculate the effective price of giving.[5]

2.3 Related Literature

We are not aware of any previous study that conducts a clean comparison between subsidy types under a pure unit donation scheme. At the same time, there are parallels with a number of papers studying giving to public goods. Like our study, Meier (2007) and Gneezy et al. (2014), for example, feature discrete choice sets. However, both frame donations in money, rather than physical

[5]If rebates are realized with a delay, a third difference comes into play: Discounts lower the price of giving ex ante whereas rebates lower it ex post. In this paper, rebates are always realized without delay.

quantities, and focus on matches only, yielding results that align with the wider money donation literature. A different parallel is with Lewis and Small (2019) who also provide subjects with information about the cost of a unit of impact and test different framings of the information. They find that a cheaper unit price leads to lower donations, an effect that is eliminated or reversed if the price is framed in units-per-dollar rather than dollars-per-unit. Yet, donations in their study are again framed in terms of money, rather than physical quantities, and the authors do not compare different subsidy types. Also relevant is a literature in marketing that experimentally compares product promotion strategies such as coupons, rebates, price discounts, and matches. The papers in this literature arrive at conflicting hypotheses and experimental findings (see e.g. Mishra and Mishra, 2011; Chen et al., 2012), with matches outperforming discounts and vice versa. More in line with the money donations literature are Davis and Millner (2005) who find that matches outperform rebates also for private goods while simple price reductions have an effect in between. While our focus on public goods sets our paper apart from this literature, its setting of unit donations offers the opportunity to study price discounts, a tool from private product promotion, in the context of charitable donations.

The paper probably closest to the focus of ours is Kesternich et al. (2016). The authors compare the effectiveness of rebate and matching subsidies in the context of carbon offsetting: When buying their ticket(s) online, clients of a long distance bus operator decide whether to offset the carbon emissions from their travel at a given price per kilogram emissions. Rebates are found to increase the likelihood to offset while matches only do so at certain matching rates and to a lesser extent. However, the overall contributions net of the subsidy are higher under matches. Key differences to our study are the binary decision format and the use of an impure public good for which the size of giving is tied to the private good. Both limit the comparability to our setup. A few other studies implicitly employ an experimental design soliciting unit donations to an environmental public good (Löschel et al., 2013; Diederich and Goeschl, 2014, 2017, 2018), but they do not compare subsidy types.[6]

3 Experimental design

3.1 Donation appeal

We adapt the real-donation dictator game introduced by Eckel and Grossman (1996) and subsequently applied to compare subsidy types (Eckel and Grossman, 2003; Davis and Millner, 2005; Davis, 2006; Eckel and Grossman, 2006a,b). In the standard version of the game, subjects decide how much of their money endowment to hold and how much to pass to a charity. In our variant of the game, subjects decide how many units of the charitable good to fund at a given nominal price.

Our variant of the game requires a charitable good or service that is easily quantifiable. We approached a relief organization, Sign of Hope e.V., which frequently uses various forms of unit donation schemes in their fundraising campaigns. Among their activities, we chose the treatment of malnourished children in a certain area of South Sudan as this service offered practical units and prices for our experiment. The children were treated in two "bush clinics" operated by the relief organization at the time of the experiment. Treating one child for one month using a special nutritional paste and high energy cookies requires a donation of US$15. We divided this number into practical units of nutritional packages per child and day, which implies a "price" of $0.50 per package.

The donation appeal was part of an online survey and participants used their

[6]Weakly related to a unit donation scheme are so called "buy-one give-one" business models (see e.g. Marquis and Park, 2014; Hamby, 2016) where for each product purchased the selling company donates a similar product. However, in these models, the donation is tied to the consumption of a private good. We are not aware of any paper introducing or comparing subsidies in that context.

reward for completing the survey ($2) to make any donations. The donation appeal introduced the charity, the charitable good, and its marginal provision cost to the charity. We also provided a link to the charity's web page and informed subjects about a transparency award the charity had won to increase trust in the charity (Adena et al., 2019). The final part of the donation appeal was treatment specific. Table 1 shows the seven treatment conditions. In the control condition, no subsidy was applied and subjects chose how many packages to fund at a price of $0.50. The remaining six treatment conditions follow a 3×2 factorial design with one factor being the subsidy type (rebate, match, or discount) and the other factor being the effective price ($0.33 or $0.25) implied by the level of the subsidy. In the instructions, we framed the rebate conditions as 33% (50%) rebate and stated that while providing packages would cost the subject $0.50 apiece, a rebate of $0.17 ($0.25) per package would be added to the subject's final reward at the end of the experiment. For the matching conditions, instructions stated that for every two packages (each package) that the subject provided at a nominal cost of $0.50 apiece, one package would be matched at no additional cost to the subject. As a result, the charity would receive the combined number of packages. For the discount conditions, instructions stated that the subject would be able to provide packages for $0.33 ($0.25) instead of $0.50 apiece. Hence, the nominal price corresponded to the effective price. For all subsidy types, instructions noted that the subsidy, i.e. the rebate, the matched units, or the money needed to reduce the nominal price, was provided by "a third party." This was a truthful yet indefinite reference to the research budget involved. Subjects chose the desired number of packages from a drop-down menu. The exact wording of each treatment can be found in Table 2.[7]

[7] Figure C1 in Appendix C shows a screenshot of the complete donation appeal.

Table 1: Treatment conditions

Subsidy type	Subsidy rate	Nominal unit price	Effective unit price	N
No subsidy	–	$0.50	$0.50	83
Rebate	33%	$0.50	$0.33	71
Match	1:2	$0.50	$0.33	85
Discount	33%	$0.33	$0.33	90
Rebate	50%	$0.50	$0.25	58
Match	1:1	$0.50	$0.25	80
Discount	50%	$0.25	$0.25	91

Table 2: Final part of donation appeal wording by treatment

Treatment	Wording
No subsidy	*In this survey, you may use all, part, or none of your reward of $2.00 for this HIT to provide these nutrition packages. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward.*
33% rebate	[Same text as in no subsidy condition] *Upon completion of the survey, a third party has agreed to fund a **33% rebate** for each package you provide. The rebate ($0.17 per package provided) will be added to your reward.*
1:2 match	[Same text as in no subsidy condition] *A third party has agreed to **match every two packages you provide**, at no additional cost to you. So, for example, if you choose to provide 2 packages, Sign of Hope will receive 3.*
33% discount	*In this survey, you will be able to provide these nutritional packages for **$0.33** apiece (a third party will fund the remaining $0.17). You may use all, part, or none of your reward of $2.00 for this HIT to provide packages. Thus, you may choose any number between 0 and 6 packages. $0.33 per package will be subtracted from your reward.*
50% rebate	[Same text as in no subsidy condition] *Upon completion of the survey, a third party has agreed to fund a **50% rebate** for each package you provide. The rebate ($0.25 per package provided) will be added to your reward.*
1:1 match	[Same text as in no subsidy condition] *A third party has agreed to **match each package you provide**, at no additional cost to you. So, for example, if you choose to provide 2 packages, Sign of Hope will receive 4.*
50% discount	*In this survey, you will be able to provide these nutritional packages for **$0.25** apiece (a third party will fund the remaining $0.25). You may use all, part, or none of your reward of $2.00 for this HIT to provide packages. Thus, you may choose any number between 0 and 8 packages. $0.25 per package will be subtracted from your reward.*

3.2 Experimental protocol

We conduct the experiment online recruiting U.S. residents from the online labor market, Amazon's Mechanical Turk (AMT).[8] In the case of money donations, online field experiments based on AMT (Gandullia and Lezzi, 2018; Gandullia, 2019) and not based on AMT (Bekkers, 2015) have been successfully used to replicate the superiority of matches over rebates. Gandullia and Lezzi (2018) and Gandullia (2019) use the same endowment level and subsidy rates as we do. Our task was posted five times on the MTurk task queue between July and October 2015, resulting in five online sessions. Interested workers were informed that they would earn $2 for answering a 20-minutes academic survey on several topics. The payment is rather high when compared to the average hourly wage of about $3.1 to $3.5 per worker on AMT (Hara et al., 2018). Each worker was only able to particpate once. Donations were mentioned as one of the topics, but the real-donation dictator game was not particularly salient compared to other survey elements. As a result, it is unlikely that subjects considered the donation task as the main subject of investigation. Interested workers followed a link which directed them to the survey containing the experiment on Qualtrics. Having followed the link to the survey platform, interested workers read and confirmed an informed consent page about the research study.

The experimental survey consisted of four parts: (1) the donation appeal, (2) a questionnaire on various topics, (3) a low-stake version of the Eckel-Grossman risk task (Eckel and Grossman, 2002, 2008a),[9] and (4) a 5-item manipulation

[8]AMT provides several benefits to researchers, among them fast and easy access to subjects, a diverse subject pool, and low costs (Paolacci et al., 2010; Mason and Suri, 2012). Several papers have examined the suitability of AMT for experimental research and have found encouraging results (Paolacci et al., 2010; Ross et al., 2010; Mason and Suri, 2012; Rand, 2012). Results in these papers highlight a high internal consistency of self-reported demographics, an incentive-compatibility of earnings, and a "spammer"-free workforce from the built-in reputation system. They also present and review results from successful replications of standard experimental games in AMT (e.g. Paolacci et al., 2010; Rand, 2012). In implementing our experiment, we followed the suggestions for researchers in that literature and the Guidelines for Academic Requesters on AMT (WeAreDynamo, 2014).

[9]We opt for the Eckel-Grossman Risk Task because of its simplicity and quickness. A

check questionnaire comparable to Eckel and Grossman (2003, 2006b) and Davis and Millner (2005). Parts (1) and (2) were presented in random order. Hence, a subject encountered the donation appeal either before or after the questionnaire. One of the treatment conditions was drawn at random and presented to the subject (between-subjects design).[10] The questionnaire of part (2) consisted of questions on sociodemographics, employment, and religious beliefs, as well as current ambient environmental conditions and the Ten Item Personality Inventory (TIPI), which is a standard one-minute version of more extensive multi-item instruments to assess the Big Five personality dimensions (Gosling et al., 2003; Ehrhart et al., 2009). After completion of all survey parts, a unique code was shown that the subject had to enter into the survey task window on AMT to receive payment.

In total, we have 613 observations of participants starting the survey and 599 completed records. Incomplete records were dropped from the analysis.[11] The obvious concern that some subjects may fraudulently use multiple accounts to participate more than once is generally seen as a minor problem in online experiments (Horton et al., 2011; Paolacci et al., 2010).[12] We nevertheless follow the common approach to exclude 40 subjects with duplicate Internet Protocol addresses from the analysis. Including them does not change the results. We also dropped one subject who indicated an age below 18 in the questionnaire, despite having confirmed an age above 18 when agreeing to the informed consent

sample of AMT workers is likely to exhibit larger heterogeneity in numeracy than a standard laboratory sample of students. The Eckel-Grossman task has been shown to produce better results with people with low mathematical skills (Dave et al., 2010). Stakes start out at $0.28 for the sure option and end up at $0.02 and $0.70 for the most risky gamble.

[10] A different sample of 113 subjects received the treatment conditions in a within-subjects (WS) design to investigate how the results differ if individuals are forced to directly compare different subsidy types. We provide details about the design and the results in Appendix D.

[11] Among the complete observations, three subjects had restarted the survey and hence created an incomplete duplicate record. We kept the complete observations of these three subjects after making sure that they had not encountered a treatment condition in their first attempt and gave the same answers in the survey.

[12] In the case of AMT, having multiple accounts is forbidden by Amazon's Terms of Service (Mason and Suri, 2012) and creating an account requires a unique credit card number (Paolacci et al., 2010).

statement. This leaves us with a sample of 558 subjects (see Table 1 for the allocation of subjects across treatments). Average payouts were \$1.79 (net of donations and including an average of \$0.30 additional payment for the risk task). Subjects took on average 8.38 minutes to complete the experiment.

4 Results

Variables elicited in the questionnaire suggest a diverse sample of subjects (see Table B2 in Appendix B): Slightly less than half of subjects are female, and slightly less than half graduated from college. About one-third of subjects are married, and about the same share has children under age 16 living in the household. Both age and income are well spread, with the median age in category 26–34 and the median yearly income in category US\$40,000–49,999.

Answers to the manipulation check questions indicate that on average, subjects clearly understood instructions and procedures, felt that their anonymity was preserved, trusted the experimenters and the charity, and found the recipients of the donations worth supporting (Table B2 in Appendix B). Comparing the subsamples across treatments using a multivariate analysis of variance (MANOVA) suggests that randomization into treatments was successful ($p = 0.46$ for Pillai's trace).[13]

In Table 3, we present descriptive results for donations observed in the experimental treatments. Panel A reports mean values and standard deviations. Column 1 shows the average number of nutritional packages that subjects selected to donate in their version of the donation appeal. Hence, column 1 is units purchased before any rebate or matching subsidy but accounts for subsidized nominal prices in the discount conditions. If multiplied by the nominal price, column 1 would correspond to out-of-pocket expenses that are frequently de-

[13] We exclude the manipulation check items from the list of dependent variables due to potential endogeneity. A separate MANOVA of the manipulation check questions does not indicate significant differences, and including them does not result in a lower p-value.

noted as "checkbook giving" in standard money donation experiments. Column 2 reports individual net donations in dollars that result from subjects' choices after all subsidies are accounted for. That is, column 2 is column 1 evaluated at the (discounted) nominal price minus any rebates. Column 3 refers to the mean number of nutritional packages the charity "receives", based on subjects' choices, that is, column 1 plus any matched packages. If we multiplied column 3 by \$0.50 for all treatments, we would obtain gross charity receipts in dollars, a common focus in money donation experiments. Because of perfect collinearity of both receipts measures, we will only use column 3 as charity receipts in the following analysis. Columns 4 and 5 show the intensive and the extensive margin of giving, respectively. Column 4 reports mean charity receipts conditional on being a donor while column 5 reports the fraction of donors. For each variable, panels B to D report p-values of pairwise comparison tests between treatments.

4.1 Rebates versus matches

Focusing on the comparison of rebates and matches first, three main results follow from columns 1 to 3 of Table 3.

Result 1 *(Charity receipts) Charity receipts do not significantly differ between rebate and matching subsidies.*

Column 3 shows that the charity received an average of about 1.7 (1.9) units per subject in the 33% (50%) rebate condition and about 1.5 (2.2) units per subject in the 1:2 (1:1) matching condition. At both effective prices, the levels of charity receipts do not significantly differ between the two subsidy types ($p = 0.52$ and $p = 0.41$).

Result 2 *(Net donations) There is no evidence for crowding-in or crowding-out of net donations by rebate or matching subsidies of any level.*

Table 3: Descriptive results

Treatments			Donation variable				
Condition	Nominal unit price ($)	Effective unit price ($)	Individual choice (units)	Net donation ($)	Charity receipt, uncond. (units)	Charity receipt, cond. (units)	Prob. of donation
			(1)	(2)	(3)	(4)	(5)
A. Mean values (S.D.)							
No subsidy	0.50	0.50	1.169	0.584	1.169	2.256	0.518
			(1.413)	(0.706)	(1.413)	(1.177)	(0.503)
33% rebate	0.50	0.33	1.690	0.558	1.690	2.400	0.704
			(1.545)	(0.510)	(1.545)	(1.294)	(0.460)
1:2 match	0.50	0.33	1.059	0.529	1.506	3.048	0.494
			(1.339)	(0.670)	(2.021)	(1.886)	(0.503)
33% discount	0.33	0.33	1.478	0.488	1.478	2.771	0.533
			(1.973)	(0.651)	(1.973)	1.927	(0.502)
50% rebate	0.50	0.25	1.931	0.483	1.931	2.732	0.707
			(1.705)	(0.426)	(1.705)	(1.379)	(0.459)
1:1 match	0.50	0.25	1.113	0.556	2.225	3.787	0.588
			(1.253)	(0.626)	(2.506)	(2.176)	(0.495)
50% discount	0.25	0.25	2.143	0.536	2.143	3.545	0.604
			(2.831)	(0.708)	(2.831)	(2.879)	(0.492)
B. Tests of subsidy types: p-values							
B1. At effective price of $0.33							
33% rebate vs. 1:2 match			0.01	0.76	0.52	0.06	0.01
33% rebate vs. 33% discount			0.44	0.44	0.44	0.27	0.03
1:2 match vs. 33% discount			0.10	0.68	0.93	0.49	0.60
B2. At effective price of $0.25							
50% rebate vs. 1:1 match			0.00	0.41	0.41	0.01	0.15
50% rebate vs. 50% discount			0.57	0.57	0.57	0.07	0.20
1:1 match vs. 50% discount			0.00	0.84	0.84	0.63	0.82
C. Tests of subsidized prices: p-values							
50% vs. 33% rebate			0.41	0.36	0.41	0.24	0.97
1:1 vs. 1:2 match			0.79	0.79	0.05	0.09	0.23
50% vs. 33% discount			0.07	0.64	0.07	0.11	0.34
D. Tests of subsidized vs. unsubsidized price: p-values							
33% rebate vs. no subsidy			0.03	0.79	0.03	0.58	0.02
1:2 match vs. no subsidy			0.61	0.61	0.21	0.02	0.76
33% discount vs. no subsidy			0.24	0.35	0.24	0.12	0.84

Panel A shows mean values of the donation variables for each treatment (standard deviations in parentheses). Column 1 reports the number of packages that subjects selected to give at the nominal price. Column 2 shows the net dollar contribution implied by subjects' choices, i.e., column 1 evaluated at the nominal price minus the rebate (if any). Column 3 reports the overall number of packages received by the charity, i.e., column 1 plus matched units (if any). Column 4 reports the same measure as column 3 but conditional on giving (intensive margin). Column 5 reports the share of subjects who donated at least one package (extensive margin). Panels B to D show pairwise tests between treatment conditions. Panel B compares subsidy types conditional on the effective price. Panel C compares the two subsidized prices, $0.25 and $0.33, conditional on subsidy type. Panel D compares the unsubsidized price with the subsidized price arising from the low subsidy rate for each subsidy type. Columns 1 to 4 in panels B to D report p-values of two-tailed t-tests with unequal variances. Column 5 report p-values of a Pearson χ^2 tests for binary data.

Column 2 indicates that net donations exhibit a roughly constant share of around one quarter of the endowment across all treatment conditions. Neither the introduction of a subsidy at any rate nor an increase in the subsidy rate results in significant changes.

To achieve the same level of charity receipts and net donations, subjects need to select more units to donate under a rebate than under a match (since the match is paid on top of the units selected). This is exactly what we observe in column 1: The average number of units selected is at least 0.5 units larger ($p \leq 0.01$ at both effective prices).

Result 3 *(Law of demand) Charity receipts significantly decrease in the price.*

Column 3 shows that charity receipts significantly increase in the subsidy level, either from introducing the subsidy ($p = 0.03$ in case of the rebate) or from increasing the subsidy rate ($p = 0.05$ in case of the match). Given Result 2, this increase in charity receipts is entirely driven by the additional money that is provided as subsidy payment by the third party.

The indifference between rebates and matches regarding charity receipts contrasts with virtually all previous literature on money donations. The typical finding there is that charity receipts under matches exceed those under rebates while "checkbook giving", which corresponds to column (1) in our setup, would be roughly the same under both subsidy types. We therefore now examine whether this indifference remains after controlling for the available covariates.

Consider an individual, i, who decides how many units, g_i, of the charitable good to provide. Since the individual has a limited endowment and only complete units of the good can be provided, the individual faces a discrete and ordered choice set. For example, subjects who are assigned to the control condition can give 0, 1, 2, 3 or 4 packages. We estimate an Ordered Probit Model with the individual choice as dependent variable,[14] which is subsequently employed

[14]Whereas a common approach in the literature is to estimate a Tobit Model with the mon-

to analyze the effect of the different subsidies on the level of charity receipts. This is possible, since, given a subsidy scheme, the individual choice directly translates into a level of charity receipts. The advantage of this procedure will become clear after explaining the model in more detail.

The model is based on a latent variable

$$g_i^* = x_i'\beta + s_i'\gamma + \epsilon_i \tag{1}$$

where x_i is a vector of covariates, including a constant, s_i is a vector consisting of a dummy for each subsidy type as well as subsidy type specific dummies for whether the offered subsidy rate is high and therefore the effective price is low (\$0.25), β and γ are vectors of parameters to be estimated and ϵ_i is an i.i.d. standard normally distributed error term. In general, each of the possible choices an individual can make, $g_i \in \{g^1, ..., g^J\}$, is associated with a certain interval of the latent variable:

$$g_i = g^j \qquad \text{if } \alpha_{j-1} < g_i^* \leq \alpha_j \qquad \text{for } j = 1, ..., J \tag{2}$$

where α_0 and α_J are set to $-\infty$ and ∞, respectively, $\alpha_1 = 0$ and $\alpha_2, ..., \alpha_{J-1}$ are threshold parameters to be estimated.

Another specific feature of the experimental design, which we need to account for in the estimation, is that the choice sets differ across treatments. For subjects facing a match, rebate, or no subsidy, each selected unit requires an expenditure of \$0.5. Although in case of the rebate, part of this expenditure is refunded, this refund can not be donated (similar to most money donation experiments).

etary value which the individual has chosen to give, charity receipts, or their logarithmized value as dependent variable, the discrete nature of our donation decision makes it an unsuitable choice to model our data. This is supported by conditional moment tests significantly rejecting the assumption of normally distributed error terms for the Tobit Model with charity receipts or logarithmized charity receipts as dependent variable ($p < 0.01$). We nevertheless report the results of different Tobit specifications together with simple OLS results as robustness checks in Table E4 in Appendix E. Qualitative results do not substantially differ.

Since the endowment is \$2, the maximum number of packages that can be selected is four in those treatment conditions. In contrast, each unit selected in the discount treatments requires an expenditure of only \$0.33 or \$0.25 since the nominal price per unit is discounted upfront. Therefore, subjects can select up to six or eight packages, depending on whether the discount rate is low or high.[15]

We account for this by adding censoring to the model. Since we do not observe a choice of seven packages in our data, we cannot include this category in the model. Furthermore, only a single subject decides to provide five packages. In our main analysis we treat this subject as if the subject had donated six packages. Results are similar if we explicitly include the choice category of five packages or omit the observation (see columns 1 to 4 of Table E3 in Appendix E). Consequently, the choice sets in the following analysis are $g_i \in \{0, 1, 2, 3, 4, 6, 8\}$ for the 50% discount treatment, $g_i \in \{0, 1, 2, 3, 4, 6\}$ for the 33% discount treatment and $g_i \in \{0, 1, 2, 3, 4\}$ for all other treatments. Table B1 in Appendix B illustrates how the latent variable translates into a certain choice conditional on the treatment.

Let g_i^{max} be the maximum number of packages an individual i can give, which depends on the treatment the individual is assigned to. The probability to observe a choice g_i from the set $\{g^1, ..., g^7\} = \{0, 1, 2, 3, 4, 6, 8\}$ is then given by

$$\begin{aligned} Pr(g_i = g^j | x_i, s_i) = \mathbb{1}\{g^j < g_i^{max}\}\{&\Phi(\alpha_j - x_i'\beta - s_i'\gamma) \\ &- \Phi(\alpha_{j-1} - x_i'\beta - s_i'\gamma)\} \\ &+ \mathbb{1}\{g^j = g_i^{max}\}\{1 - \Phi(\alpha_{j-1} - x_i'\beta - s_i'\gamma)\} \\ &\text{for } j = 1, ..., 7 \end{aligned} \tag{3}$$

The parameters $\theta = (\beta, \gamma, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6)$ are estimated by maximum likelihood, without and with covariates. The covariates include indicator variables for

[15]See Table B3 in Appendix B for the detailed choice set of each treatment.

gender, marital status, whether the individual holds a college degree, whether children under the age of 16 live in the household, whether the individual is a registered voter, whether the individual frequently attends religious services, whether the individual works for a not-for-profit organization, and for task order. We also include categorical variables for age, income, residential environment, and religion as well as scores for the Big Five personality dimensions and risk preferences. Afterwards, we use the estimated coefficients to calculate the average marginal effect of each subsidy on charity receipts.[16]

In Panel A of Table 4, columns 1 and 2, we present the results in the form of the average marginal effects on charity receipts. For example, offering a 33% rebate is estimated to increase average charity receipts per individual by about 0.5 packages compared to not offering any subsidy (column 1, Rebate), whereas increasing the subsidy rate from 33% to 50% has no significant effect in the case of the rebate (column 1, Rebate × low price). Analogously to Table 3, the predicted levels of charity receipts are compared pairwise across subsidy types in Panel B, holding the effective price constant. The estimates confirm Result 1 and Result 3. We repeat the same exercise for predicted levels of net donations. In line with Result 2, we neither find significant differences in net donations between subsidy types at the same effective price nor any evidence for crowding-in or crowding-out at any conventional significance level when changing the price of giving due to a specific subsidy type.[17]

To check for misspecification of the model we use the Lagrange Multiplier test derived by Glewwe (1997). In both model specifications, the Null of normally distributed error terms cannot be rejected ($p > 0.35$ and $p > 0.95$, without and

[16]The formulas used to calculate these effects are derived in Appendix A and are based on the deterministic relationship between the individual choice and charity receipts. Using the individual choice as dependent variable simplifies the estimation procedure: If the choice sets of any two treatments differ, one is a subset of the other, and the smaller set is simply censored from above. Additionally, the selected number of packages represents subjects immediate choice and therefore is probably the most intuitive concept for modeling the decision process.

[17]Results are available from the authors upon request.

with covariates, respectively). We also find little evidence that the results are substantively affected by allowing for heteroscedasticity.[18]

Having observed that charity receipts do not differ between rebates and matches, we ask whether this indifference result masks heterogeneities in the "conversion rates" of the experimental donation call (the extensive margin of giving) and the conditional level of charity receipts demanded by donors (the intensive margin of giving). As discussed in Section 1, rebates decrease the minimum net expense required to become a donor, making them potentially more effective at the extensive margin than matches. Indeed, results in column 5 of Table 3 confirm that rebates attract a larger share of donors than matches. In particular, the differences amount to roughly 21 percentage points (70.4% vs. 49.4%) and 12 percentage points (70.7% vs. 58.8%) in the case of the high and the low effective price, respectively. The difference is significant at the high effective price ($p = 0.01$) but not at the low effective price ($p = 0.15$).[19] We take this as evidence that the indifference result for the level of charity receipts is partly driven by the fact that rebate subsidies are more effective at the extensive margin.

Result 4 *(Extensive margin) Rebates are more effective in attracting donors*

[18]We expand the model in column 2 of Table 4 by modeling the variance as $exp(z_i'\rho)$. We estimate this model with different sets of covariates included in z_i. Set 1 includes age, income, gender, whether the individual frequently attends religious services, and task order. Set 2 additionally contains the Big Five personality dimensions and risk preferences. Set 3 includes all covariates. Only if we use the whole set of covariates to explicitly model heteroscedasticity the model with homoscedasticity is rejected ($p < 0.01$). Still, rebates and matches do not significantly differ in the level of charity receipts at the low subsidy rate, but matches are now estimated to raise significantly more packages than rebates at the high subsidy rate. However, one should be careful with taking these results at face value since this model specification produces some odd results. For example, a 33% discount is estimated to have a significantly negative impact on charity receipt of almost 0.4 packages, which is in strong contrast to what we observe in the data. See Table E3 in Appendix E for detailed results.

[19]The fact that the difference in the extensive margin is more pronounced for the low subsidy rate is not surprising, since for the 1:2 match the first unit donated does not result in a matching payment. Consequently, the minimum expense required to become a donor is larger than for the equivalent rebate while the impact of the action is the same: a single nutritional package received by the charity. As a result, not only the costs but also the effective prices at the margin of becoming a donor differ, further decreasing the relative attractiveness of the match.

Table 4: Estimation results

	Charity Receipts, unconditional (units)		Probability of donation (binary)		Charity Receipts, conditional (units)	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Marginal effects						
Rebate	0.546**	0.558**	0.186**	0.229***	0.091	-0.025
	(0.237)	(0.256)	(0.077)	(0.081)	(0.256)	(0.271)
Match	0.324	0.241	-0.024	-0.008	0.799**	0.478
	(0.261)	(0.287)	(0.077)	(0.085)	(0.359)	(0.391)
Discount	0.306	0.203	0.015	0.012	0.537	0.278
	(0.247)	(0.271)	(0.076)	(0.084)	(0.332)	(0.366)
Rebate × low price	0.218	0.197	0.003	-0.031	0.326	0.343
	(0.277)	(0.301)	(0.081)	(0.088)	(0.266)	(0.279)
Match × low price	0.888**	1.072***	0.093	0.115	0.783*	0.828*
	(0.373)	(0.406)	(0.077)	(0.083)	(0.448)	(0.469)
Discount × low price	0.585*	0.667*	0.071	0.064	0.571	0.869*
	(0.326)	(0.365)	(0.073)	(0.084)	(0.448)	(0.509)
B. Tests of subsidy types: p-values						
B1. At effective price of $0.33						
33% rebate vs. 1:2 match	0.43	0.29	0.01	0.00	0.05	0.19
33% rebate vs. 33% discount	0.37	0.22	0.02	0.01	0.17	0.40
1:2 match vs. 33% discount	0.95	0.90	0.60	0.81	0.53	0.65
B2. At effective price of $0.25						
50% rebate vs. 1:1 match	0.23	0.17	0.14	0.30	0.00	0.01
50% rebate vs. 50% discount	0.71	0.76	0.19	0.17	0.09	0.08
1:1 match vs. 50% discount	0.43	0.32	0.82	0.70	0.33	0.76
Covariates[a]	No	Yes	No	Yes	No	Yes
Log likelihood	-801.28	-590.10	-372.07	-248.44	-427.37	-314.64
Observations	558	428	558	428	326	256

(1)–(2): Ordered Probit with the number of packages selected by the individual as dependent variable. (3)–(4): Probit for whether or not a donation was made. (5)–(6): Ordered Probit conditional on being a donor, with the number of packages selected by the individual as dependent variable. (1)–(2) and (5)–(6) treat a single observation with 5 selected packages as if it were 6 selected packages.

Panel A presents average marginal effects. Standard errors reported in parentheses, $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. For (1)–(2) and (5)–(6), *marginal effects* refer to the average change in expected charity receipts over all individuals or donors only, respectively. For each individual considered, the change is calculated by taking the difference in expected charity receipts between receiving a particular subsidy at the low rate (rebate, match, discount) and not receiving any subsidy or between receiving a particular subsidy at the high rate (rebate × low price, match × low price, discount × low price) and receiving the same subsidy at the low rate.

Panel B presents p-values for the pairwise comparison of treatment effects (subsidy treatment vs. no subsidy) between subsidy types, based on the average marginal effects.

[a] Covariates include gender, marital status, the Big Five personality dimensions, risk preferences, categorical variables for age, income, residential environment, and religion, and dummies for whether the individual holds a college degree, whether children under the age of 16 live in the household, whether the individual is a registered voter, whether the individual frequently attends religious services, whether the individual works for a not-for-profit organization and task order. Likelihood ratio tests reject that their coefficients in model (2), (4) and (6) are jointly zero ($p < 0.01$, $p < 0.01$ and $p < 0.05$, respectively).

than matches.

Turning to the intensive margin, column 4 of Table 3, shows that conditional charity receipts under both match conditions significantly exceed the corresponding values in the rebate conditions (3.0 vs. 2.4 units and 3.8 vs. 2.7 units, respectively; $p = 0.06$ and $p = 0.01$).

Result 5 *(Intensive margin) Charity receipts per donor are higher under matching than under rebate subsidies.*

Comparing matching and rebate treatments in column 4 and 5 of Table 3 to the control reinforces the view that the channel through which rebates raise unconditional charity receipts primarily is the extensive margin whereas matches unfold their impact through the intensive margin. For the rebate, introducing the low subsidy rate increases the share of donors in column 5 from 51.8% to 70.4% ($p = 0.02$) compared to the no subsidy condition, while the intensive margin is not significantly affected ($p = 0.58$). In contrast, for the match, introducing the low subsidy rate increases mean conditional charity receipts in column 4 from 2.3 to 3.0 units ($p = 0.02$) compared to the no subsidy condition, while the extensive margin is unaffected ($p = 0.76$).

Again, we supplement the descriptive results by estimating appropriate parametric models. Columns 3 and 4 of Table 4 refer to a Probit without and with covariates, respectively, while columns 5 and 6 capture the intensive margin by estimating an Ordered Probit Model for donors only. The latter is set up analogously to the Ordered Probit Model described above. If we assumed that after controlling for observable characteristics, the error terms between the decisions to donate and how much to donate are uncorrelated, we could interpret these two models jointly as a Two-Part model. The parametric estimation confirms results 4 and 5, but for the intensive margin, only the difference between matches and rebates at the high subsidy rate remains significant when covariates are included.

One concern regarding the comparison of rebate and matching subsidies in our experiment might be that differences in the budget constraints for charity receipts could drive some of the results. Under a rebate, the highest possible number of packages received by the charity is always four, since the donor must fully fund each selected unit at a nominal price of $0.5 before receiving the refund. In contrast, the matching subsidy applies on top of the selected packages: If under a 1:1 match a donor decides to spend her whole endowment of $2 to fund four packages, then the charity receives eight packages.[20] Similar differences apply to almost all laboratory experiments comparing rebates and matches in the money donation literature, as they also endow subjects with a limited amount of money. However, in the money donation literature, it is shown that the higher effectiveness of matches observed in laboratory studies also holds in field experiments where subjects use their own income (Eckel and Grossman, 2008b, 2017). If the budget constraint mattered in our design, the results could understate the effectiveness of rebates compared to matches for situations in which the budget constraint is more loose or non-binding. This implies that rebates might be even more effective than matches in such situations.

To provide a robustness check on this matter, we revisit Result 1 and Result 5 by recoding subjects' choices in order to equalize budget constraints. In our data, a total of 29.5% of subjects give the maximum amount under rebates, compared to 10.9% in the matching conditions. For each condition, we set all charity receipts above four packages to four packages (the maximum level of charity receipts under rebates). Detailed results are presented in Table B4 in Appendix B. Although rebates now provide the highest average number of packages received by the charity, the difference to matches is not significant at the high subsidy rate ($p = 0.65$) and only marginally significant at the low subsidy rate ($p = 0.09$). Hence, Result 1 survives the robustness check. In contrast, the

[20]See Table B3 in Appendix B for the detailed choice set of each treatment.

difference on the intensive margin (Result 5) vanishes after censoring charity receipt at four packages. A possible explanation is that matches create larger conditional donations only in settings where the budget constraint is binding for a sufficiently large share of individuals.

4.2 Discount subsidies

Subsidies that put a simple price reduction on nominal prices turn out to be as effective as rebate and matching subsidies that produce equivalent effective prices. Charity receipts in column 3 and net donations in column 2 of Table 3 do not significantly differ from those under the other two subsidy types ($p \geq 0.44$ for each comparison). Hence, the increased salience of the effective price under discounts does not seem to affect demand, and this alternative subsidy type does not lend itself to a more effective subsidy. Instead, the selected number of units in column 1 under a discount is statistically indistinguishable from that selected under a rebate ($p = 0.44$ and $p = 0.57$) but by an amount higher than under the corresponding match ($p = 0.10$ and $p < 0.005$) which approximately makes up for the additional units provided as matching payment. In line with the law of demand, charity receipts increase in the subsidy level, although only the increase from the price change from \$0.33 to \$0.25 is significant ($p = 0.07$). There is again no evidence for crowding-in or -out. Our Ordered Probit estimates in Table 4, columns 1–2, fully confirm these findings.

Result 6 *(Discounts) The discount subsidy produces the same level of charity receipts and net donations as rebates and matches. Increasing the subsidy rate increases charity receipts, without crowding-in or crowding-out net donations.*

Differentiating behavior into the extensive and the intensive margin shows that, at the low subsidy rate, the likelihood to give under the discount is significantly lower than under the rebate (column 5 of Table 3 and columns 3–4 of Table 4). Since we would expect the responses to rebates and discounts to be similar at the extensive margin, this difference may hint towards a behavioral bias in the response to an equivalent decrease in the cost of becoming a donor. At the intensive margin, there is some marginally significant difference between discounts and rebates at the high subsidy rate, shown in column 4 of Table 3 and columns 5–6 of Table 4. In comparison to the matching subsidies, there are neither significant difference at the extensive nor at the intensive margin.

Result 7 *(Discounts at the extensive and intensive margin) Discounts are equally effecitve as matches at both margins. They are significantly less effective in attracting donors than rebates (at the low subsidy rate) and create higher charity receipts per donor than rebates (at the high subsidy rate).*

5 Discussion

In our experiment, we find both equivalence between matches and rebates as subsidy-based incentives to donors and an equivalence with price discounts. This equivalence under a unit donation scheme contrasts with the existing literature that has examined subsidy types under a money donation scheme and has generally found matches outperforming rebates.[21] This includes papers which also use an online experimental methodology (Bekkers, 2015; Gandullia and Lezzi, 2018; Gandullia, 2019) of which two recruit from the same subject pool and use similar endowment levels as we do (Gandullia and Lezzi, 2018; Gandullia, 2019). A closer parallel exists with experimental evidence comparing product promotions in the marketing literature. For private goods, matches (bonus packs) and price discounts frequently, but not always, perform equally well (Chen et al.,

[21]We are aware of only one other paper that finds the same level of charity receipts between rebates and matches, but it does so under a choice architecture that does not resemble a typical donation decision: In Davis (2006), subjects do not decide how much to donate (checkbook giving) but how much the charity receives (charity receipts). This choice architecture, motivated by an investigation of the causal mechanism that underpins the standard result of non-equivalence, makes it difficult to compare their results with ours.

2012; Hardesty and Bearden, 2003; Sinha and Smith, 2000).[22] For charitable goods, however, our finding is unusual.

As discussed in Section 2.2, rebates and matches are no longer theoretically equivalent under a unit donation scheme. When donors face the choice architecture of a unit donation scheme, the minimum net expense required to become a donor is lower under rebates than under matches. This does not hold for a money donation scheme. As a result, the behavior on the extensive margin might be a crucial factor to explain why matches do not outperform rebates in our setting. In line with this reasoning, our results on the extensive margin differ from those obtained in the context of money donations schemes. We find that rebates attract more donors than matches. Bekkers (2015) finds the opposite by using similar subsidy rates in a standard money donation choice architecture. Furthermore, Gandullia and Lezzi (2018) use the same online population, subsidy rates, and endowment levels as we do but focus on a standard money donation scheme. In their experiment, both rebates and matches increase the fraction of donors compared to a no-subsidy condition and effect sizes between the different subsidy types are similar.

In our experiment, the minimum positive net donation under a match amounts to \$0.50. Under a 33% (50%) rebate, 25% (22%) of donors give less than \$0.50. Recoding those subjects as non-donors eliminates any significant difference on the extensive margin, which offers additional evidence that the lower cost of becoming a donor might drive the results. Matches now lead to higher charity receipts than rebates (1.506 vs. 1.437 units at the low subsidy rate and 2.225 vs. 1.707 units at the high subsidy rate), yet differences between the two subsidy types remain statistically insignificant ($p = 0.817$ and $p = 0.167$). The importance of the extensive margin to explain the different results in our setting is also in line with the finding that unit and money donation schemes produce

[22] Ex-post rebates tend to perform less well (Sinha and Smith, 2000).

different behavior on the extensive margin (Diederich et al., 2020).

An interesting question for future research is how the effectiveness of the different subsidy types under a unit donation scheme depends on the level of the unsubsidized unit price. At a given subsidy rate, a larger unsubsidized price increases the absolute difference in the minimum expense required to become a donor between rebates and matches. As a result, the differences on the extensive margin might become more pronounced, which in turn might be sufficient to make the rebate raise more money than the match. In contrast, reducing the unit size might move results closer to what has been found for money donation schemes. Future research is also needed to better understand the behavior under the discount subsidy. In our experiment, discounts are less effective in attracting donors than rebates despite implying the same costs of becoming a donor. One speculative reason is that a donor has the feeling of providing the whole unit herself under the rebate, while she gets the impression of only providing a fraction of the unit under the discount. In this case, the donor might derive lower warm glow utility when selecting one unit under the discount compared to the rebate.

As mentioned earlier, the setting in Kesternich et al. (2016) has some similarities with a unit donation scheme. In the field experiment, clients of a long distance bus operator decide whether to offset the carbon emissions from their travel at a given price. Similar to our results, the authors find that rebates of up to 50% do not affect net donations and are more effective than matches at the extensive margin. However, in their study matches still outperform rebates with respect to charity receipts and net donations. Both the binary choice setting and the use of an impure public good might explain these differences to our results.

6 Conclusions

In this paper, we define a class of donations in which donors are asked to choose the number of discrete units of the charitable good to fund instead of the amount of money to give. We call the former a unit donation and the latter a money donation. We present empirical evidence from an online field experiment designed to analyze how different subsidy types affect unit donations. By doing so we focus on the two prevalent subsidy types, rebates and matches, as well as a subsidy type which is novel to public good contributions and framed as a simple price discount. The latter can be applied since for unit donations, each physical unit has a well-defined price that can be explicitly reduced.

The results remarkably differ from the well-established findings for money donations. Matching subsidies do not outperform rebates but are equally effective in raising funds. Yet matching and rebate subsidies create different responses at the extensive and intensive margin of giving. While rebates significantly increase the fraction of donors, matches produce larger donations. The significantly higher likelihood to give under rebates compared to matches is in contrast to the money donation literature and appears to be one reason why rebates catch up with matches in the unit donation setting of our experiment. Price discounts raise similar levels of funds as rebates and matches. None of the subsidy types significantly affects net donations.

Our results underline the relevance of the decision environment when soliciting donations and, thus, have important implications for practitioners. First, charities that employ unit donations in their fundraising efforts cannot rely on the insights from the existing literature on subsidizing money donations. Second, whether it is useful to apply a certain type of subsidy to unit donations depends on a charitys objectives. Previous research has shown that individuals that donated once are more likely to give in the future. If the charity desires to maximize the set of donors, our evidence suggests that a rebate is preferable over a match. If the charity instead seeks to maximize charity receipts, the choice of the subsidy type seems to be irrelevant, offering some additional degrees of freedom to charities in their campaign design. Third, in cases where funds are not tied to being used as a subsidy, subsidizing unit donations is not necessarily beneficial as on the aggregate it may not crowd in private giving.

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Appendix A (For online publication) Derivation of marginal effects

To explain the calculation of the average marginal effects we first explicitly write s_i in equation (1) as

$$s_i = \begin{pmatrix} rebate_i \\ match_i \\ discount_i \\ rebate_i \times low\ price_i \\ match_i \times low\ price_i \\ discount_i \times lowprice_i \end{pmatrix},$$

where $rebate_i$, $match_i$, and $discount_i$ are dummies for whether individual i faces a particular subsidy type, $rebate_i \times low\ price_i$, $match_i \times low\ price_i$, and $discount_i \times lowprice_i$ are subsidy type specific dummies indicating whether the subsidy rate is high and the effective price is low ($0.25).

We use the estimated parameters $\hat{\theta}$ and the deterministic relationship between the selected number of packages (individual choice), g_i, and charity receipts, cr_i, to calculate the expected level of charity receipts, $\hat{E}_i$, predicted by the model for each individual under each treatment condition. For example, to receive individual i's expected level of charity receipts under the 50% rebate we set $s_{i,r25} = (1,0,0,1,0,0)'$ – the subscript $r25$ indicates the subsidy type and the implied effective price in cents – and calculate the predicted value of the latent variable according to equation (1):

$$\hat{g}^*_{i,r25} = x_i'\hat{\beta} + s_{i,r25}'\hat{\gamma}$$

Afterwards we estimate the expected level of charity receipts by

$$\hat{E}_{i,r25} = \sum_{k=0}^{8} k\hat{P}(cr_i = k|x_i, s_i = s_{i,r25}) = \sum_{k=0}^{4} k\hat{P}(g_i = k|x_i, s_i = s_{i,r25})$$
$$= 4 - \Phi(\hat{a}_4 - \hat{g}^*_{i,r25}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,r25}) - \Phi(\hat{a}_2 - \hat{g}^*_{i,r25}) - \Phi(-\hat{g}^*_{i,r25})$$

where $\hat{P}(cr_i = k|x_i, s_i = s_{i,r25}) = 0$ for $k > 4$ since the maximum level of charity receipts under the rebate is four. The second equality then follows from the fact that for all treatment conditions except matches the individual choice (in physical units) is equal to the level of charity receipts (in physical units). The last equality follows from using equation (3) to calculate $\hat{P}(y_i = k|x_i, s_i = s_{i,r25})$. The expected levels of charity receipts for the other six conditions (no subsidy, 33% rebate, 1:2 match, 1:1 match, 33% discount, and 50% discount) are accordingly calculated as

$$\hat{E}_{i,n50} = 4 - \Phi(\hat{a}_4 - \hat{g}^*_{i,n50}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,n50}) - \Phi(\hat{a}_2 - \hat{g}^*_{i,n50}) - \Phi(-\hat{g}^*_{i,n50})$$
$$\hat{E}_{i,r33} = 4 - \Phi(\hat{a}_4 - \hat{g}^*_{i,r33}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,r33}) - \Phi(\hat{a}_2 - \hat{g}^*_{i,r33}) - \Phi(-\hat{g}^*_{i,r33})$$
$$\hat{E}_{i,m33} = 6 - 2\Phi(\hat{a}_4 - \hat{g}^*_{i,m33}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,m33}) - 2\Phi(\hat{a}_2 - \hat{g}^*_{i,m33}) - \Phi(-\hat{g}^*_{i,m33})$$
$$\hat{E}_{i,m25} = 8 - 2\Phi(\hat{a}_4 - \hat{g}^*_{i,m25}) - 2\Phi(\hat{a}_3 - \hat{g}^*_{i,m25}) - 2\Phi(\hat{a}_2 - \hat{g}^*_{i,m25}) - 2\Phi(-\hat{g}^*_{i,m25})$$
$$\hat{E}_{i,d33} = 6 - 2\Phi(\hat{a}_5 - \hat{g}^*_{i,d33}) - \Phi(\hat{a}_4 - \hat{g}^*_{i,d33}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,d33}) - \Phi(\hat{a}_2 - \hat{g}^*_{i,d33}) - \Phi(-\hat{g}^*_{i,d33})$$
$$\hat{E}_{i,d25} = 8 - 2\Phi(\hat{a}_6 - \hat{g}^*_{i,d25}) - 2\Phi(\hat{a}_5 - \hat{g}^*_{i,d25}) - \Phi(\hat{a}_4 - \hat{g}^*_{i,d25}) - \Phi(\hat{a}_3 - \hat{g}^*_{i,d25}) - \Phi(\hat{a}_2 - \hat{g}^*_{i,d25}) - \Phi(-\hat{g}^*_{i,d25})$$

We use the expected level of charity receipts to calculate average marginal effects (AMEs) for introducing a subsidy type at the low rate (rebate, match, discount) and for changing the subsidy rate for a specific subsidy type from low to high (rebate × low price, match × low price, discount × low price):

$$AME_{rebate} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,r33} - \hat{E}_{i,n50}$$

$$AME_{match} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,m33} - \hat{E}_{i,n50}$$

$$AME_{discount} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,d33} - \hat{E}_{i,n50}$$

$$AME_{rebate\ \times\ low\ price} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,r25} - \hat{E}_{i,r33}$$

$$AME_{match\ \times\ low\ price} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,m25} - \hat{E}_{i,m33}$$

$$AME_{discount\ \times\ low\ price} = \frac{1}{N}\sum_{i=1}^{N} \hat{E}_{i,d25} - \hat{E}_{i,d33}$$

These average marginal effects are presented in column 1 and 2 of Table 4. Standard errors are calculated using the delta method.

Appendix B (For online publication) Additional figures and tables

Table B1: Latent variable and individual choice

Latent variabel g_i^*	Individual choice (g_i) in ... no subsidy control, 33% rebate, 1:2 match, 50% rebate, 1:1 match	33% discount	50% discount
$(-\infty, 0]$	0	0	0
$(0, \alpha_2]$	1	1	1
$(\alpha_2, \alpha_3]$	2	2	2
$(\alpha_3, \alpha_4]$	3	3	3
$(\alpha_4, \alpha_5]$	4	4	4
$(\alpha_5, \alpha_6]$	4	6	6
(α_6, ∞)	4	6	8

Table B2: Summary statistics

Variable	Full sample			Control			33% rebate			1:2 match			33% discount			50% rebate			1:1 match			50% discount		
	μ	σ	N	μ	σ	N	μ	σ	N	μ	σ	N	μ	σ	N	μ	σ	N	μ	σ	N	μ	σ	N
Female	0.48	0.50	558	0.45	0.50	83	0.49	0.50	71	0.48	0.50	85	0.44	0.50	90	0.55	0.50	58	0.44	0.50	80	0.53	0.50	91
Age (years):																								
18–25	0.25	0.44	558	0.22	0.41	83	0.28	0.45	71	0.26	0.44	85	0.27	0.44	90	0.36	0.48	58	0.28	0.45	80	0.16	0.37	91
26–34	0.37	0.48	558	0.39	0.49	83	0.38	0.49	71	0.34	0.48	85	0.37	0.48	90	0.31	0.47	58	0.40	0.49	80	0.41	0.49	91
35–54	0.29	0.46	558	0.29	0.46	83	0.30	0.46	71	0.34	0.48	85	0.29	0.46	90	0.24	0.43	58	0.23	0.42	80	0.35	0.48	91
55–64	0.06	0.25	558	0.08	0.28	83	0.04	0.20	71	0.05	0.21	85	0.04	0.21	90	0.07	0.26	58	0.10	0.30	80	0.07	0.25	91
>65	0.01	0.12	558	0.02	0.15	83	0.00	0.00	71	0.01	0.11	85	0.03	0.18	90	0.02	0.13	58	0.00	0.00	80	0.01	0.10	91
Married	0.34	0.47	554	0.35	0.48	82	0.30	0.46	71	0.30	0.46	84	0.38	0.49	90	0.31	0.47	58	0.28	0.45	79	0.41	0.49	90
Children[a]	0.30	0.46	558	0.34	0.48	83	0.25	0.44	71	0.29	0.46	85	0.24	0.43	90	0.31	0.47	58	0.28	0.45	80	0.40	0.49	91
College degree	0.47	0.50	558	0.49	0.50	83	0.46	0.50	71	0.49	0.50	85	0.43	0.50	90	0.47	0.50	58	0.44	0.50	80	0.48	0.50	91
Income[b] (US$):																								
<10,000	0.09	0.28	540	0.07	0.26	81	0.10	0.31	68	0.07	0.26	84	0.10	0.31	86	0.07	0.26	56	0.14	0.35	77	0.06	0.23	88
10,000–19,999	0.11	0.31	540	0.09	0.28	81	0.09	0.29	68	0.13	0.34	84	0.10	0.31	86	0.11	0.31	56	0.13	0.34	77	0.11	0.32	88
20,000–29,999	0.12	0.33	540	0.14	0.34	81	0.16	0.37	68	0.08	0.28	84	0.08	0.28	86	0.07	0.26	56	0.10	0.31	77	0.19	0.40	88
30,000–39,999	0.11	0.32	540	0.10	0.30	81	0.12	0.32	68	0.19	0.40	84	0.09	0.29	86	0.11	0.31	56	0.09	0.29	77	0.10	0.30	88
40,000–49,999	0.15	0.35	540	0.05	0.22	81	0.12	0.32	68	0.18	0.39	84	0.19	0.39	86	0.18	0.39	56	0.21	0.41	77	0.11	0.32	88
50,000–74,999	0.21	0.41	540	0.33	0.47	81	0.13	0.34	68	0.15	0.36	84	0.22	0.42	86	0.21	0.41	56	0.18	0.39	77	0.24	0.43	88
75,000–99,999	0.09	0.28	540	0.07	0.26	81	0.09	0.29	68	0.08	0.28	84	0.12	0.32	86	0.14	0.35	56	0.06	0.25	77	0.07	0.25	88
100,000–150,000	0.10	0.30	540	0.14	0.34	81	0.15	0.36	68	0.11	0.31	84	0.03	0.18	86	0.11	0.31	56	0.05	0.22	77	0.10	0.30	88
>150,000	0.02	0.15	540	0.01	0.11	81	0.04	0.21	68	0.00	0.00	84	0.06	0.24	86	0.00	0.00	56	0.03	0.16	77	0.01	0.11	88
Residential environment:																								
Rural	0.20	0.40	558	0.16	0.37	83	0.20	0.40	71	0.22	0.42	85	0.21	0.41	90	0.12	0.33	58	0.24	0.43	80	0.22	0.42	91
Suburban	0.51	0.50	558	0.60	0.49	83	0.56	0.50	71	0.41	0.50	85	0.50	0.50	90	0.53	0.50	58	0.45	0.50	80	0.53	0.50	91
Urban	0.29	0.45	558	0.24	0.43	83	0.24	0.43	71	0.36	0.48	85	0.29	0.46	90	0.34	0.48	58	0.31	0.47	80	0.25	0.44	91
Registered voter	0.86	0.34	552	0.83	0.38	82	0.91	0.28	70	0.85	0.36	84	0.82	0.39	89	0.86	0.35	58	0.89	0.32	79	0.89	0.32	90
Not-for-profit[c]	0.06	0.23	558	0.02	0.15	83	0.03	0.17	71	0.08	0.28	85	0.04	0.21	90	0.07	0.26	58	0.10	0.30	80	0.05	0.23	91
Religious[d]	0.13	0.34	548	0.07	0.26	82	0.10	0.30	71	0.17	0.38	82	0.15	0.36	86	0.10	0.31	58	0.14	0.35	80	0.16	0.37	89
Religion:																								
Atheist	0.38	0.49	533	0.37	0.49	81	0.40	0.49	65	0.42	0.50	83	0.46	0.50	85	0.32	0.47	57	0.33	0.47	75	0.32	0.47	87
Agostic	0.08	0.28	533	0.10	0.30	81	0.14	0.35	65	0.07	0.26	83	0.07	0.26	85	0.05	0.23	57	0.07	0.25	75	0.08	0.27	87
Roman-Catholic	0.12	0.32	533	0.10	0.30	81	0.12	0.33	65	0.06	0.24	83	0.07	0.26	85	0.14	0.35	57	0.16	0.37	75	0.17	0.38	87
Protestant	0.18	0.38	533	0.12	0.33	81	0.12	0.33	65	0.23	0.42	83	0.20	0.40	85	0.25	0.43	57	0.16	0.37	75	0.16	0.37	87
Other Christian	0.12	0.33	533	0.16	0.37	81	0.11	0.31	65	0.08	0.28	83	0.13	0.34	85	0.16	0.37	57	0.11	0.31	75	0.11	0.32	87
Other Religion	0.13	0.33	533	0.15	0.36	81	0.11	0.31	65	0.13	0.34	83	0.07	0.26	85	0.09	0.29	57	0.17	0.38	75	0.15	0.36	87
Big Five (scale 1–7):																								
Extraversion	3.18	1.60	520	3.14	1.55	77	3.00	1.41	67	3.42	1.69	77	3.07	1.66	85	3.41	1.69	54	3.14	1.57	74	3.16	1.60	86
Agreeableness	5.04	1.24	523	4.92	1.25	77	4.94	1.16	68	5.14	1.35	81	4.77	1.32	86	5.28	1.04	53	5.23	1.05	74	5.08	1.33	84
Conscientioussn.	5.13	1.30	525	5.04	1.38	78	5.01	1.40	68	5.05	1.33	81	5.15	1.24	85	5.46	1.04	56	5.13	1.32	75	5.16	1.33	82
Emotional stab.	4.62	1.53	531	4.57	1.38	79	4.62	1.44	68	4.63	1.65	80	4.42	1.64	86	4.73	1.58	56	4.78	1.55	76	4.66	1.46	86
Openness	4.67	1.29	532	4.71	1.15	80	4.67	1.22	69	4.77	1.21	77	4.86	1.21	87	4.73	1.20	56	4.76	1.50	76	4.25	1.40	87
Risk pref. (scl. 1–6)	4.06	1.78	554	3.96	1.82	83	4.25	1.80	71	4.05	1.77	84	4.18	1.73	89	3.83	1.74	58	4.20	1.75	80	3.94	1.87	89
Manipulationon check questions(scale 1-5):																								
Clarity[e]	4.58	0.67	551	4.56	0.69	82	4.54	0.70	70	4.60	0.60	84	4.57	0.75	89	4.60	0.60	55	4.64	0.53	80	4.55	0.79	91
Anonymity[f]	4.49	0.72	551	4.48	0.63	82	4.56	0.71	70	4.46	0.72	84	4.51	0.76	89	4.64	0.56	55	4.47	0.67	80	4.41	0.89	91
Trust exp.[g]	4.04	0.93	549	4.08	0.87	80	4.07	1.02	71	4.13	0.92	84	4.02	0.97	88	4.02	0.82	56	4.05	0.95	79	3.93	0.96	91
Trust charity[h]	4.13	0.90	550	4.17	0.78	80	4.17	0.93	71	4.24	0.89	84	4.01	1.02	89	4.09	0.86	56	4.18	0.87	79	4.08	0.93	91
Deserving recip.[i]	4.48	0.82	549	4.47	0.74	81	4.43	0.94	70	4.52	0.75	84	4.40	0.91	89	4.71	0.53	55	4.58	0.63	79	4.32	0.99	91
Task order[j]	0.52	0.50	558	0.43	0.50	83	0.52	0.50	71	0.45	0.50	85	0.58	0.50	90	0.59	0.50	58	0.59	0.50	80	0.53	0.50	91

[a] Has children under age 16 living in household. [b] Household income. [c] Works for a not-for-profit organization. [d] Frequently attends religious services. [e] "The instructions, questions, and tasks in this survey were clear and easy to understand". [f] "The procedures followed in this experiment preserved your anonymity". [g] "The money you donated to the charity will be given to the charity". [h] "The charity will use the money to provide the chosen number of nutrition packages". [i] "The recipients of the donations are deserving of support". [j] 1 if the subject encountered the donation task after the questionnaire, 0 if before.

Table B3: Choice set by treatment

Treatment	Individual choice [units]	Corresponding net donations [$]	Corresponding charity receipts [units]
No subsidy	0	0	0
	1	0.5	1
	2	1	2
	3	1.5	3
	4	2	4
33% rebate	0	0	0
	1	0.33	1
	2	0.66	2
	3	0.99	3
	4	1.32	4
1:2 match	0	0	0
	1	0.5	1
	2	1	3
	3	1.5	4
	4	2	6
33% discount	0	0	0
	1	0.33	1
	2	0.66	2
	3	0.99	3
	4	1.32	4
	5	1.65	5
	6	1.98	6
50% rebate	0	0	0
	1	0.25	1
	2	0.5	2
	3	0.75	3
	4	1	4
1:1 match	0	0	0
	1	0.5	2
	2	1	4
	3	1.5	6
	4	2	8
50% discount	0	0	0
	1	0.25	1
	2	0.5	2
	3	0.75	3
	4	1	4
	5	1.25	5
	6	1.5	6
	7	1.75	7
	8	2	8

Table B4: Robustness check for charity receipts censored at 4 packages

Treatment	Charity receipts unconditional (units)	Charity receipts conditional (units)
	(1)	(2)
A. Mean values (S.D.)		
No subsidy	1.169	2.256
	(1.413)	(1.177)
33% rebate	1.690	2.400
	(1.545)	(1.294)
1:2 match	1.271	2.571
	(1.538)	(1.192)
33% discount	1.233	2.313
	(1.446)	(1.188)
50% rebate	1.931	2.732
	(1.705)	(1.379)
1:1 match	1.800	3.064
	(1.702)	(1.009)
50% discount	1.495	2.473
	(1.615)	(1.372)
B. Tests of subsidy types: p-values		
B1. At effective price of $0.33		
33% rebate vs. 1:2 match	0.09	0.51
33% rebate vs. 33% discount	0.06	0.73
1:2 match vs. 33% discount	0.87	0.31
B2. At effective price of $0.25		
50% rebate vs. 1:1 match	0.65	0.21
50% rebate vs. 50% discount	0.12	0.36
1:1 match vs. 50% discount	0.23	0.01
C. Tests of subsidized prices: p-values		
50% vs. 33% rebate	0.41	0.24
1:1 vs. 1:2 match	0.04	0.04
50% vs. 33% discount	0.25	0.53
D. Tests of subsidized vs. unsubsidized price: p-values		
33% rebate vs. no subsidy	0.03	0.58
1:2 match vs. no subsidy	0.66	0.22
33% discount vs. no subsidy	0.77	0.82

Panel A shows mean values of the donation variables for each treatment (standard deviations in parentheses). Column 1 shows unconditional charity receipts with each number of packages above four recoded to four. Column 2 shows the corresponding numbers for charity receipts conditional on being a donor. Shown in panels B and C are p-values of two-tailed t-tests with unequal variances.

Appendix C (For online publication) Instructions

In this survey, each participant will have the opportunity to provide nutritional packages for malnourished children in the African country of South Sudan.

Decades of civil war have ravaged South Sudan, and many children are severely malnourished. The nutritional packages will be delivered by Sign of Hope, an accredited relief organization that operates two hospitals in South Sudan.

In 2010, Sign of Hope won the Transparency Award for German non-profit organizations. Eighty cents out of every dollar they receive go directly to relief efforts, while the remaining twenty cents cover their overhead costs. You can read more about the organization on http://www.hoffnungszeichen.de/sign-of-hope-africa.html.

One nutritional package, which feeds one malnourished child for one day, can be provided by the charity for a donation of $0.50. The package consists of a specially designed paste and high-energy cookies to help the children gain weight.

In this survey, you will be able to provide these nutritional packages for **$0.25** apiece (a third party will fund the remaining $0.25). You may use all, part, or none of your reward of $2.00 for this HIT to provide packages. Thus, you may choose any number between 0 and 8 packages. $0.25 per package will be subtracted from your reward.

Please indicate your choice below:

Figure C1: Example donation appeal, 50% discount treatment. The final paragraph differed between treatments.

Appendix D (For online publication) Within-subjects design

If the results of the within-subjects (WS) design mirrored the results of the between-subjects (BS) design, the WS variation could be used to learn more about how those results come about. However, as we will show, the results of the WS design substantially differ. Although under these circumstances we rank the external validity of the BS design higher, the WS data can provide insights into subjects' decision process when they are forced to compare different conditions.

In the experiment, 146 subjects were randomly assigned to the WS treatment in which all seven treatment conditions were jointly displayed on the donation call page in random order (Figure D1). Instructions informed subjects that one of the conditions would be randomly selected through a lottery and implemented. Subjects then entered, for each condition, an integer number indicating their desired number of units. 113 subjects completed this treatment. 27 of 33 incomplete observations had missing entries only in one or several of the donation conditions but were complete otherwise. Taking a conservative approach, we also drop these in the following analysis. Interpreting them as zeros and including them does not change the main results.

Table D1 shows summary statistics of the sample in the WS design. Using a multivariate analysis of variance (MANOVA) to compare this sample to the one that was assigned to the BS design suggests that randomization into designs was successful ($p = 0.44$).

Table D2 presents the main results analogously to Table 3. Beginning with the unconditional level of charity receipts in column 3, we observe that under a WS design, matches and discounts are more effective in providing the charitable good than rebates. This finding is most pronounced for the low price of \$0.25.

In this survey, each participant will have the opportunity to provide nutritional packages for malnourished children in the African country of South Sudan.

Decades of civil war have ravaged South Sudan, and many children are severely malnourished. The nutritional packages will be delivered by Sign of Hope, an accredited relief organization that operates two hospitals in South Sudan.

In 2010, Sign of Hope won the Transparency Award for German non-profit organizations. Eighty cents out of every dollar they receive go directly to relief efforts, while the remaining twenty cents cover their overhead costs. You can read more about the organization on http://www.hoffnungszeichen.de/sign-of-hope-africa.html.

One nutritional package, which feeds one malnourished child for one day, can be provided by the charity for a donation of $0.50. The package consists of a specially designed paste and high-energy cookies to help the children gain weight.

In this survey, you may use all, part, or none of your reward of $2.00 for this HIT to provide these nutrition packages.

Below, you find seven different price conditions. For each condition, please indicate the number of packages you choose to provide under this condition.

One of the seven price conditions will be implemented in real. This condition will be randomly selected through a lottery after this survey. So, since each case may become real with equal probability, you will want to answer each condition as if it is the condition that will be implemented .

Your choice:

Condition C:
In this condition, you will be able to provide these nutritional packages for **$0.50 apiece**. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward.

Condition E:
In this condition, you will be able to provide these nutritional packages for **$0.33** apiece (a third party will fund the remaining $0.17). Thus, you may choose any number between 0 and 6 packages. $0.33 per package will be subtracted from your reward.

Condition D:
In this condition, you will be able to provide these nutritional packages for **$0.25** apiece (a third party will fund the remaining $0.25). Thus, you may choose any number between 0 and 8 packages. $0.25 per package will be subtracted from your reward.

Condition R:
In this condition, you will be able to provide these nutritional packages for $0.50 apiece. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward. A third party has agreed to fund a **33% rebate** for each package you provide. Upon completion of the survey, the rebate ($0.17 per package provided) will be added to your reward.

Condition S:
In this condition, you will be able to provide these nutritional packages for $0.50 apiece. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward. A third party has agreed to fund a **50% rebate** for each package you provide. Upon completion of the survey, the rebate ($0.25 per package provided) will be added to your reward.

Condition M:
In this condition, you will be able to provide these nutritional packages for $0.50 apiece. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward. A third party has agreed to **match every two packages you provide**, at no additional cost to you. So, for example, if you choose to provide 2 packages, Sign of Hope will receive 3.

Condition N:
In this condition, you will be able to provide these nutritional packages for $0.50 apiece. Thus, you may choose any number between 0 and 4 packages. $0.50 per package will be subtracted from your reward. A third party has agreed to **match each package you provide**, at no additional cost to you. So, for example, if you choose to provide 2 packages, Sign of Hope will receive 4.

Figure D1: Donation appeal in the WS design

Table D1: Summary statistics for BS sample, WS sample, and combined sample

Variable	Combined sample			BS sample			WS sample		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Female	0.48	0.50	671	0.48	0.50	558	0.46	0.50	113
Age (years):									
18–25	0.25	0.43	671	0.25	0.44	558	0.21	0.41	113
26–34	0.38	0.49	671	0.37	0.48	558	0.43	0.50	113
35–54	0.29	0.45	671	0.29	0.46	558	0.27	0.45	113
55–64	0.07	0.25	671	0.06	0.25	558	0.07	0.26	113
>65	0.01	0.12	671	0.01	0.12	558	0.01	0.09	113
Married	0.33	0.47	667	0.34	0.47	554	0.27	0.45	113
Children[a]	0.30	0.46	671	0.30	0.46	558	0.26	0.44	113
College degree	0.48	0.50	670	0.47	0.50	558	0.54	0.50	112
Income[b] (US$):									
<10,000	0.09	0.28	649	0.09	0.28	540	0.07	0.26	109
10,000–19,999	0.11	0.31	649	0.11	0.31	540	0.11	0.31	109
20,000–29,999	0.12	0.33	649	0.12	0.33	540	0.14	0.35	109
30,000–39,999	0.13	0.34	649	0.11	0.32	540	0.20	0.40	109
40,000–49,999	0.15	0.35	649	0.15	0.35	540	0.15	0.36	109
50,000–74,999	0.20	0.40	649	0.21	0.41	540	0.12	0.33	109
75,000–99,999	0.09	0.29	649	0.09	0.28	540	0.09	0.29	109
100,000–150,000	0.10	0.30	649	0.10	0.30	540	0.10	0.30	109
>150,000	0.02	0.15	649	0.02	0.15	540	0.02	0.13	109
Residential environment:									
Rural	0.20	0.40	671	0.20	0.40	558	0.19	0.39	113
Suburban	0.52	0.50	671	0.51	0.50	558	0.54	0.50	113
Urban	0.29	0.45	671	0.29	0.45	558	0.27	0.45	113
Registered voter	0.87	0.34	663	0.86	0.34	552	0.88	0.32	111
Not-for-profit[c]	0.05	0.22	671	0.06	0.23	558	0.03	0.16	113
Religious[d]	0.13	0.34	659	0.13	0.34	548	0.14	0.34	111
Religion:									
Atheist	0.37	0.48	643	0.38	0.49	533	0.36	0.48	110
Agostic	0.09	0.28	643	0.08	0.28	533	0.10	0.30	110
Roman-Catholic	0.12	0.32	643	0.12	0.32	533	0.14	0.34	110
Protestant	0.18	0.38	643	0.18	0.38	533	0.17	0.38	110
Other Christian	0.12	0.33	643	0.12	0.33	533	0.12	0.32	110
Other Religion	0.12	0.33	643	0.13	0.33	533	0.11	0.31	110
Task order[e]	0.51	0.50	671	0.52	0.50	558	0.46	0.50	113
Big Five (scale 1–7):									
Extraversion	3.21	1.62	626	3.18	1.60	520	3.32	1.73	106
Agreeableness	5.02	1.23	628	5.04	1.24	523	4.91	1.20	105
Conscientiousness	5.11	1.29	630	5.13	1.30	525	4.97	1.24	105
Emotional stability	4.65	1.52	638	4.62	1.53	531	4.79	1.49	107
Openness	4.70	1.29	640	4.67	1.29	532	4.83	1.32	108
Risk pref. (scale 1–6)	4.00	1.79	667	4.06	1.78	554	3.65	1.79	113
Manipulation check questions (scale 1-5):									
Clarity[f]	4.56	0.68	663	4.58	0.67	551	4.46	0.70	112
Anonymity[g]	4.48	0.73	663	4.49	0.72	551	4.43	0.78	112
Trust experiment[h]	4.04	0.93	660	4.04	0.93	549	4.01	0.93	111
Trust charity[i]	4.13	0.90	662	4.13	0.90	550	4.13	0.92	112
Deserving recipients[j]	4.47	0.81	661	4.48	0.82	549	4.42	0.79	112

[a]Has children under age 16 living in household. [b]Household income. [c]Works for a not-for-profit organization. [d]Frequently attends religious services. [e]1 if the subject encountered the donation task after the questionnaire, 0 if before. [f] "The instructions, questions, and tasks in this survey were clear and easy to understand". [g] "The procedures followed in this experiment preserved your anonymity". [h] "The money you donated to the charity will be given to the charity". [i] "The charity will use the money to provide the chosen number of nutrition packages". [j] "The recipients of the donations are deserving of support".

Potentially, the discontinuities in the match—the first and third unit funded not resulting in an additional matched unit—discourage giving at the effective price of $0.33. For net donations, we observe in column 2 that introducing matches and discounts significantly crowds in net donations while an increase in the rebate rate induces crowding-out.

At first glance the discrepancy in results compared to the BS sample might come as a surprise, but a closer look at the extensive and intensive margins in columns 4 and 5 offers a simple explanation for most differences. Unlike in the BS design, we find that for a given effective price, subsidies are equally successful in attracting donors at the extensive margin (see also Figure E2). We speculate that under a WS design, subjects may not decide whether to donate for each subsidy separately, but rather make a single participation choice across all subsidies with a similar rate and then respond to the subsidy type mostly at the intensive margin. In contrast, the introduction of a subsidy and the height of its rate seems to be highly relevant for the participation decision, regardless of its type. This response behavior is very different from the one observed in the BS design and likely to be affected by demand effects from "nudging" subjects to compare options in the WS design (Charness et al., 2012). We therefore follow the literature and ascribe higher external validity to the results in the between-subjects design.

Table D2: Descriptive results, within-subject design

Treatments			Donation variable				
Condition	Nominal unit price ($)	Effective unit price ($)	Individual choice (units)	Net donation ($)	Charity receipt, uncond. (units)	Charity receipt, cond. (units)	Prob. of donation
			(1)	(2)	(3)	(4)	(5)
A. Mean values (S.D.)							
No subsidy	0.50	0.50	0.558	0.279	0.558	1.750	0.319
			(1.026)	(0.513)	(1.026)	(1.105)	(0.468)
33% rebate	0.50	0.33	0.867	0.286	0.867	2.130	0.407
			(1.278)	(0.422)	(1.278)	(1.147)	(0.493)
1:2 match	0.50	0.33	0.699	0.350	0.965	2.535	0.381
			(1.085)	(0.542)	(1.614)	(1.695)	(0.488)
33% discount	0.33	0.33	0.982	0.324	0.982	2.362	0.416
			(1.547)	(0.510)	(1.547)	(1.580)	(0.495)
50% rebate	0.50	0.25	0.991	0.248	0.991	2.196	0.451
			(1.373)	(0.343)	(1.373)	(1.233)	(0.500)
1:1 match	0.50	0.25	0.805	0.403	1.611	3.434	0.469
			(1.109)	(0.554)	(2.218)	(2.052)	(0.501)
50% discount	0.25	0.25	1.363	0.341	1.363	2.906	0.469
			(1.996)	(0.499)	(1.996)	(2.003)	(0.501)
B. Tests of subsidy types: p-values							
B1. At effective price of $0.33							
33% rebate vs. 1:2 match			0.01	0.03	0.27	0.19	0.32
33% rebate vs. 33% discount			0.08	0.08	0.08	0.42	0.56
1:2 match vs. 33% discount			0.00	0.25	0.80	0.62	0.16
B2. At effective price of $0.25							
50% rebate vs. 1:1 match			0.04	0.00	0.00	0.00	0.56
50% rebate vs. 50% discount			0.00	0.00	0.00	0.03	0.59
1:1 match vs. 50% discount			0.00	0.05	0.05	0.18	1.00
C. Tests of subsidized prices: p-values							
50% vs. 33% rebate			0.06	0.05	0.06	0.79	0.10
1:1 vs. 1:2 match			0.13	0.13	0.00	0.02	0.01
50% vs. 33% discount			0.00	0.24	0.00	0.13	0.06
D. Tests of subsidized vs. unsubsidized price: p-values							
33% rebate vs. no subsidy			0.00	0.78	0.00	0.13	0.00
1:2 match vs. no subsidy			0.01	0.01	0.00	0.02	0.02
33% discount vs. no subsidy			0.00	0.02	0.00	0.04	0.00

Panel A shows mean values of the donation variables for each treatment (standard deviations in parentheses). Column 1 reports the number of packages that subjects selected to give at the nominal price. Column 2 shows the net dollar contribution implied by subjects' choices, i.e., column 1 evaluated at the nominal price minus the rebate (if any). Column 3 reports the overall number of packages received by the charity, i.e., column 1 plus matched units (if any). Column 4 reports the same measure as column 3 but conditional on giving (intensive margin). Column 5 reports the share of subjects who donated at least one package (extensive margin). Panels B to D show pairwise tests between treatment conditions. Panel B compares subsidy types conditional on the effective price. Panel C compares the two subsidized prices, $0.25 and $0.33, conditional on subsidy type. Panel D compares the unsubsidized price with the subsidized price arising from the low subsidy rate for each subsidy type. In panels B to D, columns 1 to 3 report p-values of two-tailed paired t-tests, column 4 reports p-values of two-tailed unpaired t-tests with unequal variances, and column 5 reports p-values of McNemar's χ^2 tests for paired binary data.

Appendix E (Not for publication) Additional figures and tables

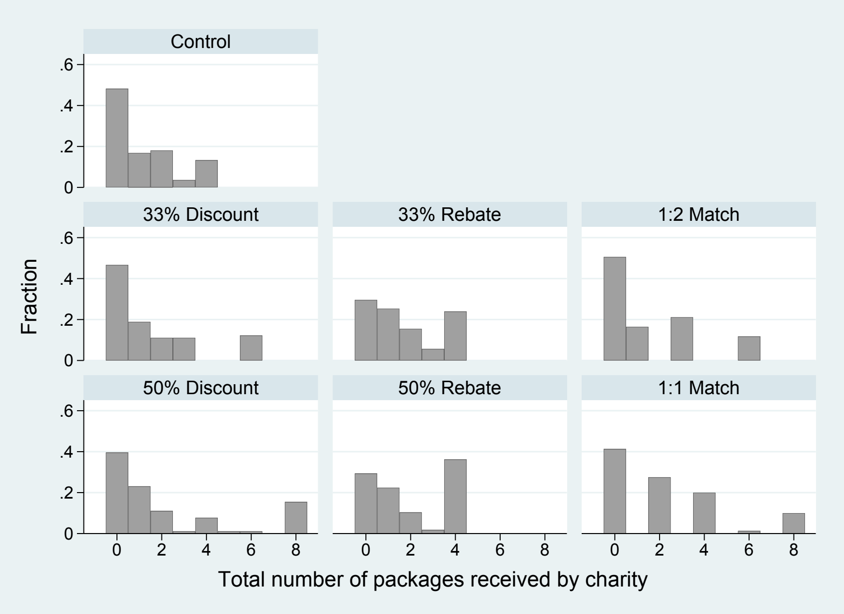

Figure E1: Distribution of charity receipts (between-subjects design)

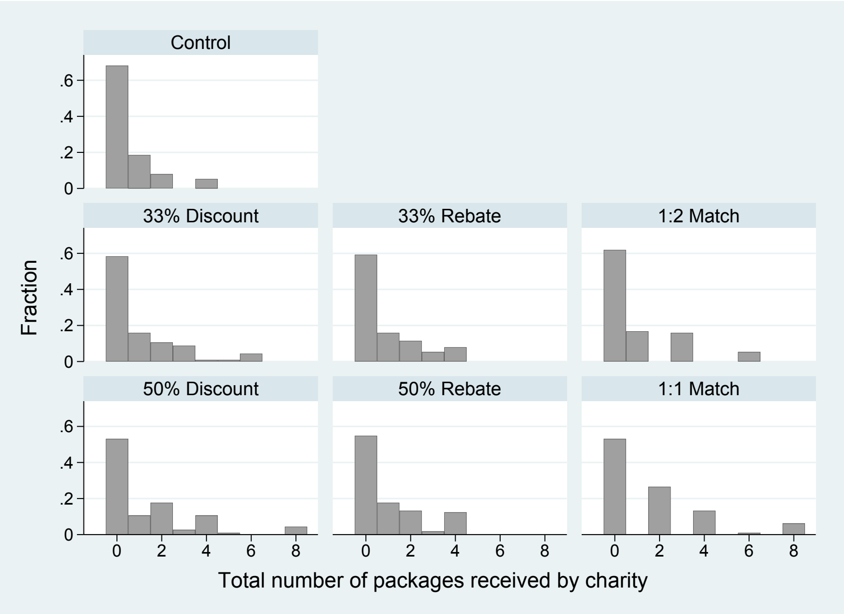

Figure E2: Distribution of charity receipts (within-subjects design)

Table E1: Nonparametric test results

Comparison	Donation variable				
	Individual choice (units)	Net donation ($)	Charity receipt, uncond. (units)	Charity receipt, cond. (units)	Prob. of donation
	(1)	(2)	(3)	(4)	(5)
B. Tests of subsidy types: p-values					
B1. At effective price of $0.33					
33% rebate vs. 1:2 match	0.01	0.21	0.06	0.28	0.01
	[0.01]	[0.24]	[0.08]	[0.32]	[0.02]
33% rebate vs. 33% discount	0.08	0.08	0.08	0.72	0.03
	[0.09]	[0.09]	[0.09]	[0.74]	[0.06]
1:2 match vs. 33% discount	0.38	0.47	0.90	0.34	0.61
	[0.42]	[0.51]	[0.91]	[0.38]	[0.66]
B2. At effective price of $0.25					
50% rebate vs. 1:1 match	0.01	0.89	0.89	0.03	0.15
	[0.01]	[0.89]	[0.89]	[0.04]	[0.24]
50% rebate vs. 50% discount	0.39	0.39	0.39	0.65	0.20
	[0.41]	[0.41]	[0.41]	[0.68]	[0.30]
1:1 match vs. 50% discount	0.20	0.50	0.50	0.06	0.82
	[0.22]	[0.53]	[0.53]	[0.08]	[0.85]
C. Tests of subsidized prices: p-values					
50% vs. 33% rebate	0.49	0.36	0.49	0.25	0.97
	[0.51]	[0.39]	[0.51]	[0.29]	[0.98]
1:1 vs. 1:2 match	0.53	0.53	0.07	0.08	0.23
	[0.56]	[0.56]	[0.09]	[0.12]	[0.30]
50% vs. 33% discount	0.22	0.61	0.22	0.41	0.34
	[0.24]	[0.63]	[0.24]	[0.43]	[0.41]
D. Tests of subsidized vs. unsubsidized price: p-values					
33% rebate vs. no subsidy	0.02	0.51	0.02	0.70	0.02
	[0.03]	[0.54]	[0.03]	[0.72]	[0.05]
1:2 match vs. no subsidy	0.66	0.66	0.76	0.11	0.76
	[0.69]	[0.69]	[0.78]	[0.15]	[0.79]
33% discount vs. no subsidy	0.66	0.27	0.66	0.51	0.84
	[0.68]	[0.31]	[0.68]	[0.53]	[0.86]

Panels B to D show *p*-values of two-tailed Mann-Whitney *U* tests analogously to Table 3. *p*-values of two-tailed robust rank order tests are reported in square brackets. Panel B compares subsidy types conditional on the effective price. Panel C compares the two subsidized prices, $0.25 and $0.33, conditional on subsidy type. Panel D compares the unsubsidized price with the subsidized price arising from the low subsidy rate for each subsidy type. Column 1 reports the number of packages that subjects selected to give at the nominal price. Column 2 shows the net dollar contribution implied by subjects' choices, i.e., column 1 evaluated at the nominal price minus the rebate (if any). Column 3 reports the overall number of packages received by the charity, i.e., column 1 plus matched units (if any). Column 4 reports the same measure as column 3 but conditional on giving (intensive margin). Column 5 reports the share of subjects who donated at least one package (extensive margin).

Table E2: Complete estimation results

	Individual choice (units)		Probability of donation (binary)		Individual choice (units)	
	(1)	(2)	(3)	(4)	(5)	(6)
Rebate	0.408*	0.455*	0.491*	0.710**	0.083	-0.025
	(0.178)	(0.210)	(0.209)	(0.263)	(0.231)	(0.276)
Match	-0.075	-0.147	-0.060	-0.023	-0.071	-0.335
	(0.173)	(0.211)	(0.193)	(0.247)	(0.239)	(0.299)
Discount	0.053	-0.015	0.038	0.035	0.040	-0.158
	(0.170)	(0.206)	(0.191)	(0.243)	(0.231)	(0.291)
Rebate × low price	0.152	0.151	0.008	-0.106	0.292	0.350
	(0.194)	(0.231)	(0.234)	(0.302)	(0.240)	(0.287)
Match × low price	0.097	0.193	0.236	0.338	-0.265	-0.265
	(0.173)	(0.207)	(0.196)	(0.246)	(0.237)	(0.293)
Discount × low price	0.175	0.254	0.181	0.188	0.060	0.255
	(0.164)	(0.205)	(0.188)	(0.246)	(0.218)	(0.282)
Female		0.377**		0.350*		0.362*
		(0.123)		(0.147)		(0.167)
Age:						
26–34		0.128		0.105		0.259
		(0.159)		(0.190)		(0.223)
35–54		0.245		0.186		0.373
		(0.170)		(0.205)		(0.238)
55–64		0.350		0.358		0.449
		(0.250)		(0.307)		(0.333)
≥ 65		1.211**		1.565*		0.843
		(0.422)		(0.651)		(0.489)
Married		-0.109		-0.179		0.059
		(0.147)		(0.178)		(0.198)
Children		0.051		0.206		-0.257
		(0.135)		(0.163)		(0.189)
College degree		0.062		0.198		-0.183
		(0.123)		(0.150)		(0.162)
Income ($):						
10,000–19,999		-0.110		0.166		-0.563
		(0.271)		(0.317)		(0.382)
20,000–29,999		-0.295		-0.136		-0.326
		(0.256)		(0.299)		(0.361)
30,000–39,999		-0.160		0.065		-0.418
		(0.261)		(0.309)		(0.352)
40,000–49,999		0.318		0.655*		-0.232
		(0.245)		(0.300)		(0.315)
50,000–74,999		0.057		0.178		-0.071
		(0.239)		(0.281)		(0.324)
75,000–99,999		0.310		0.763*		-0.262
		(0.281)		(0.347)		(0.370)
100,000–150,00		0.385		0.506		0.066
		(0.273)		(0.331)		(0.356)
$> 150,000$		-0.048		-0.034		-0.051
		(0.419)		(0.478)		(0.592)
Residential environment:						
Suburban		-0.036		-0.041		0.014
		(0.156)		(0.192)		(0.204)
Urban		-0.068		-0.101		-0.017
		(0.174)		(0.212)		(0.230)
Registered voter		-0.342*		-0.594**		0.098
		(0.169)		(0.221)		(0.214)
Not-for-profit		0.404		0.116		0.955**
		(0.228)		(0.275)		(0.311)
Religious		0.157		0.223		0.020
		(0.195)		(0.241)		(0.257)
Religion:						
Agostic		0.247		0.368		-0.258
		(0.217)		(0.273)		(0.288)

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Roman-Catholic		0.245		0.546*		-0.228
		(0.191)		(0.244)		(0.242)
Protestant		0.478*		0.455		0.429
		(0.203)		(0.247)		(0.268)
Other Christian		0.103		-0.017		0.240
		(0.193)		(0.230)		(0.273)
Other Religion		0.068		0.083		0.060
		(0.201)		(0.238)		(0.287)
Task order		-0.234*		-0.222		-0.149
		(0.115)		(0.138)		(0.159)
Risk pref.		0.018		-0.020		0.078
		(0.033)		(0.039)		(0.047)
Big Five:						
Extraversion		-0.054		-0.057		-0.088
		(0.039)		(0.048)		(0.055)
Agreeableness		-0.017		0.029		-0.121
		(0.051)		(0.061)		(0.073)
Conscientiousness		-0.039		0.028		-0.157*
		(0.050)		(0.060)		(0.073)
Emotional stability		-0.033		-0.131*		0.184**
		(0.045)		(0.055)		(0.062)
Openness		0.100*		0.102		0.149*
		(0.050)		(0.061)		(0.071)
Constant	0.070	0.075	0.045	-0.007	0.331	0.143
	(0.125)	(0.486)	(0.138)	(0.580)	(0.172)	(0.679)
α_1	0.550***	0.607***				
	(0.046)	(0.057)				
α_2	1.012***	1.129***			0.686***	0.790***
	(0.061)	(0.076)			(0.066)	(0.084)
α_3	1.146***	1.299***			0.859***	1.017***
	(0.065)	(0.082)			(0.073)	(0.094)
α_4	1.298***	1.466***			1.055***	1.256***
	(0.083)	(0.106)			(0.099)	(0.135)
α_5	1.384***	1.594***			1.160***	1.428***
	(0.100)	(0.135)			(0.120)	(0.174)
Log likelihood	-801.28	-590.10	-372.07	-248.44	-427.37	-314.64
Observations	558	428	558	428	326	256

This table presents the complete estimation resutlts which are used to calculate the average marginal effects presented in Table 4.
(1)–(2): Ordered Probit with the number of packages selected by the individual as dependent variable. (3)–(4): Probit for whether or not a donation was made. (5)–(6): Ordered Probit conditional on being a donor, with the number of packages selected by the individual as dependent variable. (1)–(2) and (5)–(6) treat a single observation with 5 selected packages as if it were 6 selected packages.
Standard errors reported in parentheses, *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table E3: Robustness checks – Ordered Probit

	Omit		Include		Heteroscedasticity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Marginal effects							
Rebate	0.546**	0.558**	0.546**	0.561**	0.605**	0.616**	0.343*
	(0.237)	(0.254)	(0.237)	(0.255)	(0.254)	(0.244)	(0.209)
Match	0.323	0.242	0.324	0.242	0.28	0.286	0.154
	(0.261)	(0.285)	(0.261)	(0.285)	(0.303)	(0.316)	(0.212)
Discount	0.304	0.191	0.306	0.199	0.248	0.178	-0.39**
	(0.247)	(0.269)	(0.247)	(0.27)	(0.313)	(0.3)	(0.184)
Rebate × low price	0.218	0.174	0.218	0.183	0.003	0.046	-0.117
	(0.277)	(0.298)	(0.277)	(0.298)	(0.312)	(0.293)	(0.236)
Match × low price	0.887**	1.062***	0.888**	1.067***	0.983**	0.849**	0.709**
	(0.372)	(0.404)	(0.373)	(0.405)	(0.41)	(0.404)	(0.3)
Discount × low price	0.556*	0.619*	0.581*	0.667*	0.55	0.443	0.883***
	(0.326)	(0.363)	(0.326)	(0.364)	(0.393)	(0.377)	(0.229)
B. Tests of subsidy types: p-values							
B1. At effective price of $0.33							
33% rebate vs. 1:2 match	0.43	0.29	0.43	0.29	0.28	0.29	0.40
33% rebate vs. 33% discount	0.37	0.20	0.37	0.21	0.27	0.14	0.00
1:2 match vs. 33% discount	0.95	0.87	0.95	0.89	0.92	0.74	0.00
B2. At effective price of $0.25							
50% rebate vs. 1:1 match	0.23	0.15	0.23	0.16	0.11	0.21	0.02
50% rebate vs. 50% discount	0.78	0.83	0.72	0.74	0.65	0.92	0.30
1:1 match vs. 50% discount	0.38	0.26	0.42	0.32	0.30	0.22	0.17
Covariates[a]	No	Yes	No	Yes	Yes	Yes	Yes
Heteroscedasticity	No	No	No	No	Yes	Yes	Yes
Log likelihood	-797.07	-585.76	-803.24	-592.06	-584.09	-575.30	-554.95
Observations	557	427	558	428	428	428	428

Each column refers to the estimation of an Ordered Probit Model with the number of packages selected by the individual as dependent variable. (1)–(2) omit the observation with 5 selected packages. (3)–(4) explicitly include the possibility to give 5 packages in the model. (5)–(7) expand the main model by heteroscedasticty. The variance is modeled as $exp(z_i'\rho)$ where z_i does not include a constant. In (5) z_i includes age, income, gender, whether the individual frequently attends religious services, and task order, in (6) it includes all covariates but the Big Five and risk preferences, and in (7) it includes all covariates. Using a likelihood ratio test the main model with homoscedasticity is not rejected when compared to (5) or (6), but is rejected when compared to (7), $p < 0.01$.

Panel A presents average marginal effects. Standard errors reported in parentheses, *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. For (1)–(2) and (5)–(6) *marginal effects* refer to the average change in expected charity receipts over all individuals or donors only, respectively. For each individual considered, the change is calculated by taking the difference in expected charity receipts between receiving a particular subsidy at the low rate (rebate, match, discount) and not receiving any subsidy or between receiving a particular subsidy at the high rate (rebate × low price, match × low price, discount × low price) and receiving the same subsidy at the low rate.

Panel B presents p-values for the pairwise comparison of treatment effects (subsidy treatment vs. no subsidy) between subsidy types, based on the average marginal effects.

[a] Covariates include gender, marital status, the Big Five personality dimensions, risk preferences, categorical variables for age, income, residential environment, and religion, and dummies for whether the individual holds a college degree, whether children under the age of 16 live in the household, whether the individual is a registered voter, whether the individual frequently attends religious services, whether the individual works for a not-for-profit organization and task order. Likelihood ratio tests reject that their coefficients in model (2), (4) and (6) are jointly zero ($p < 0.01$, $p < 0.01$ and $p < 0.05$, respectively).

Table E4: Robustness Checks – OLS and Tobit

	OLS		Tobit			
	(1)	(2)	(3)	(4)	(5)	(6)
Rebate	0.513*	0.64**	0.568**	0.61**	0.585**	0.648**
	(0.29)	(0.267)	(0.259)	(0.277)	(0.241)	(0.257)
Match	0.207	0.001	0.322	0.252	0.038	0.006
	(0.332)	(0.286)	(0.276)	(0.3)	(0.234)	(0.257)
Discount	0.151	0.033	0.382	0.273	0.126	0.053
	(0.317)	(0.28)	(0.273)	(0.297)	(0.232)	(0.254)
Rebate × low price	0.219	0.021	0.25	0.206	0.184	0.117
	(0.33)	(0.29)	(0.298)	(0.32)	(0.269)	(0.288)
Match × low price	0.916**	0.6**	0.695*	0.868**	0.391	0.512*
	(0.391)	(0.3)	(0.36)	(0.389)	(0.257)	(0.278)
Discount × low price	0.846**	0.35	0.68**	0.787**	0.322	0.37
	(0.42)	(0.294)	(0.346)	(0.385)	(0.247)	(0.277)
Covariates[a]	Yes	Yes	No	Yes	No	Yes
Observations	428	428	558	428	558	428

Standard errors are reported in parentheses, $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. For (1) and (2), robust standard errors are reported. The no subsidy control treatment is used as baseline. (1),(3) and (4) use charity receipts as dependent variable. All other models use the logarithm of charity receipts and charity receipts of zero are recoded as $log(0.1)$. For (3)–(6) values refer to the average marginal effects, which are based on the average change in the dependent variable over all individuals. For each individual the change is calculated by taking the difference in the dependent variable between receiving a particular subsidy at the low rate (rebate, match, discount) and not receiving any subsidy or between receiving a particular subsidy at the high rate (rebate × low price, match × low price, discount × low price) and receiving the same subsidy at the low rate.

[a] Covariates include gender, marital status, the Big Five personality dimensions, risk preferences, categorical variables for age, income, residential environment, and religion, and dummies for whether the individual holds a college degree, whether children under the age of 16 live in the household, whether the individual is a registered voter, whether the individual frequently attends religious services, whether the individual works for a not-for-profit organization and task order.