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**The Demand for Products Linked to Public Goods:
Evidence from an Online Field Experiment**

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We conduct a field experiment at a nonprofit organization's online store to study how demand changes when consumers' purchases generate revenue for a charitable cause. Consumers respond strongly when their purchases generate small donations by an anonymous outside group, but responses are substantially weaker when the outside donations are relatively large. Responses are also strong when the outside donation requires a personal donation which consumers generally decline. Overall, increasing the salience of financial incentives appears to dampen consumers' responses to charitable messages. We also present evidence that the donation pledges reduce price sensitivity and have positive long-term effects on demand.

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1.   Introduction

An increasing number of firms and organizations are selling products linked to social causes.[1] For-profit firms do this through donation pledges (e.g. Target and Whole Foods) or commitments to green or fair-trade production (e.g. Starbucks). Non-profit organizations sell products to supplement revenue from direct donations (e.g. the Nature Conservancy offers apparel and a magazine). There may be many motivations for this activity. On the supply side, a for-profit firm may offer these products for strategic reasons, perhaps because consumers or employees value the charity attribute. Non-profits may view the products as a way to advertize their causes and expand their base of supporters. Consumers' motivations may be complex as well, with positive responses to these products coming from a desire to contribute to a public good, an inference that socially linked products are of relatively high quality, or a personal utility benefit from acting charitably. With a variety of potential motivations for their actions, consumers' observable responses to socially-linked products may be complex as well.

To improve our understanding of consumers' responses to socially-linked products, we analyze data from a field experiment conducted at the online store of a large anonymous nonprofit organization (NPO). We observe how consumers' purchasing decisions are affected by variation in the revenue their choices generate for the NPO's charitable mission. This allows us to study how three aspects of demand change when products are associated with greater social benefits. First, we test whether demand shifts outward. Second, we investigate whether demand becomes steeper and price sensitivity falls. Third, we ask whether an increase in today's demand leads consumers to substitute away from future purchases or direct charitable donations.

Our examination of actions within and beyond the experimental period is new to field studies in this area. Numerous surveys and classroom experiments have established that consumers will express a willingness to favor products sold by socially responsible firms. The controlled and low-cost nature of these studies permits inference on some fine distinctions about consumers' responses, for example what types of products are most amenable to social links (Strahilevitz and Myers, 1998), whether positive or negative news has a greater impact on demand (Sen and Bhattacharya, 2001), and how consumers interpret profit donation pledges (Olsen, Pracejus, and Brown, 2003). Field studies, by contrast, are more costly to conduct as experiments and more likely to contain identification challenges when they employ observational

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[1] For a description of recent trends, see Bonini, Mendonca, and Oppenheim (2006).

data. As a result, the existing literature utilizing field data has tended to focus on testing simpler hypotheses of whether social links, in general, affect demand. Elfenbein and McManus (2007) and Popkowski Leszczyc and Rothkopf (2006) study charity auction markets to establish that bidders will submit higher bids in a charity auction compared to a non-charity auction for the same product. Hiscox and Smyth (2005) use a field experiment to demonstrate the consumers will favor products with a "fair trade" label. In these field studies, it is difficult to infer what aspects of a charity announcement are most important: Is it the presence of any offer at all? The precise terms of the charity pledge? An additional challenge lies in uncovering the broader effects of a consumer's purchase of a charity-linked product, whether through the consumer's later demand for merchandise or his donations to the same cause.

Our study also complements the substantial literature on consumers' choices in making direct charitable donations. Recent research on donation choices, largely with field experiments, has demonstrated that consumers respond in interesting and sometimes surprising ways, especially with regard to information about others' actions. Eckel and Grossman (2003) find that financially equivalent inducements for donations can bring different results, with matching pledges from other donors out-performing rebates. The results in Eckel and Grossman are echoed in Karlan and List (2007), who find that donations stimulated by matching pledges are greater than donations made under a control, but substantially different matching terms generate similar results. Shang and Croson (2006) offer further evidence that one consumer's actions can stimulate another's giving; they study the effect of telling public radio donors that another individual recently made a large gift. While the immediate effects of information and matching pledges can be substantial, Meier (2007) finds that consumers who received a short-term matching stimulus reduced their later donations such that their overall contributions were no greater than those of control group that received no stimulus. In all, these studies suggest that financial incentives matter, but information and norms may swamp these simple extrinsic motivations. The data from our experiment suggests the same.

For our study, we observed the actions of over 100,000 consumers at the NPO's online store during March and April 2007. When each new consumer arrived at the store, a "cookie" was placed on his or her internet browser to record and preserve the random assignment of the consumer into an experimental treatment. The experiment varied the appearance of the store's front page. Consumers in a control group received the standard storefront. Others were told that

$1 or $5 would be donated by an anonymous outside group if the consumer purchased at least $10 in merchandise. Yet other consumers could trigger $1, $5, or $10 donations from the outside group by purchasing at the store and donating to the NPO. All consumers received either standard store prices or discounted prices. For 12 months following the experiment, the NPO tracked consumers who purchased from the store, and we observe their subsequent store purchases and donations to the NPO.

Consumers who received donation pledges generated 20% more revenue, on average, than consumers who received no pledge.[2] Although a positive demand response to the donations pledges was expected, there were several surprising aspects of the results. First, despite the structure of the incentives, the offers had little effect on the probability that consumers ultimately purchased from the store. This implies that the additional revenue came from larger orders. While consumers who purchased under the control message spent an average of $43, those who received a donation pledge spent $51. The structure of our pledge implies that this difference did nothing to increase the outside donation to the NPO. This happened even if the pledged donation was small ($1), and more strikingly if the pledged donation was not triggered at all because the consumer did not complete the required personal donation portion of an offer. Perhaps most surprising is that consumers who observed the richest offer – a $5 outside donation with a purchase but no consumer donation required – had the weakest response among experimental treatments. Consumers appeared to ignore these $5 pledges unless their orders risked being too small to trigger the pledged donation. During the year following the experimental period, consumers who initially purchased under a donation pledges were more likely to return to the store and order again. This suggests that the brief stimulation of the experiment did not merely shift consumer spending away from future time periods. We also found very little overlap between the store customer population and the NPO's direct donors, suggesting minimal substitution between intensified store activity and donations. Our evidence on consumers' responses to changing prices is mixed. The median consumer appears to be less price-sensitive when exposed messages about pledged donations, but the average effects show no significant difference between consumers who received the control and a donation pledge.

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[2] With this statistic and others referenced in the Introduction, we describe activity in the lower 95% of all store purchases. A small number of very large orders skew the comparisons among treatments. See Section 3 for discussion of this approach.

The rest of the paper proceeds as follows. We introduce the experimental setting and procedures in Section 2, and in Section 3 we describe the data. Section 4 contains our econometric analysis of the data. In Section 5 we offer a concluding discussion and offer suggestions for future work.

2.   Experimental setting and structure

2.A.   The online store

At its online store the NPO offers a variety of apparel, books, and functional equipment consistent with its mission. The store also includes a donation opportunity with which consumers can "buy" donations in $10 increments. In addition to the central online store at which our experiment ran, some of the NPO's products can be purchased through local branches of the organization. In total, sales at the main store account for over 15% of NPO merchandise sold through all channels.

The NPO advertises the store on its home page and through emails to its past donors, customers, and volunteers. In addition, the NPO places ads for its store in periodicals and on internet search engines. Around the time of the experiment the store received approximately 60,000 visits per month yielding 1,200 orders. A typical store customer purchases two or three items during a visit, presumably for household use, but some customers represent firms or organizations that require a large quantity of items. During spring 2007 excluding the weeks of the experiment, the median order size was $28 and approximately 97% of orders included at least $10 of merchandise. During the same period, a limited number of consumers (about 1%) included donations with their orders.

Consumers who enter the store are shown a large graphic which displays a promotional message. The store's front page always includes a reminder that consumers' orders support the NPO's charitable mission. To the side of the front page's central graphic there is a list of product category links that take consumers to summary pages which display the pictures and prices of items within the product categories. From these summary pages, a consumer can click on an individual item to see a detailed picture, product description, and price, and the consumer can elect to place one or more units of the item in his shopping cart.

2.B. Experimental treatments

We conducted the experiment from March 6, 2007 until April 15, 2007.[3] During this period, each store visitor had a cookie placed in his or her internet browser to assign an experimental treatment and identification code. We use this code to track store visitors who return multiple times within the experimental period.[4] As long as the visitor's cookie was not deleted from his browser, each time he returned to the store he observed the same experimental treatment. Consumers who deleted cookies from their browser or visited the store from multiple computers (e.g., home and work) were assigned a new cookie and likely placed into a different experimental treatment. Unfortunately, we cannot measure the number of consumers who observed multiple experimental treatments due to this characteristic of cookies. In the discussion below we describe aspects of the study and data that indicate this is unlikely to be a major problem.

There are two components to each experimental treatment. First, each consumer received one of six messages regarding the charitable value of purchasing at the NPO's online store. Second, each consumer was assigned either the regular online store prices or a set of discounted prices. In total, there were 12 experimental treatments in the experiment (6 messages × 2 price levels). The 12 treatments were assigned with equal probability. During the experimental period the NPO suspended all other price promotions for its products.

2.B.i. Donation messages

Consumers' messages regarding charitable value were delivered through the central graphic of the store's front page. In the control case ("Null"), the central graphic displayed text indicating that store activity benefits the NPO's charitable mission. In Figure 1 we display the relevant portion of this central graphic, with identifying information about the NPO obscured. The extended section of obscured text is a description of the NPO's mission, and the partial image on the right of the Figure is a young girl wearing NPO apparel. The first two non-Null messages promised consumers that an additional donation would be made if they purchased at least $10 in merchandise at the online store.[5] The donation values were $1 and $5, which we identify here as

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[3] The experiment's starting date and duration were decided jointly with the NPO, and was limited in part by the NPO's desire to vary the store's promotional offers, which generally were suspended during the experiment.

[4] See Chan, Li, and MacKie-Mason (2006) on the variety of methods available for online field experiments.

[5] Together with the NPO, we decided that our donation pledges might not appear credible if they were larger than the least expensive items at the online store.

"P:1" and "P:5," respectively, and as "P:X" when referenced as a pair. The donations were pledged by the semi-anonymous "WU Support Fund" (WUSF) and were paid by the researchers. See Figure 2 for the relevant portion of the P:1 graphic. The P:5 graphic is identical except for the donation amount. In the final set of messages, consumers were promised that if they purchased $10 or more in merchandise <u>plus</u> donated $10 or more at the store, the WUSF would donate $1, $5, or $10. We identify these treatments as "P+D:1," "P+D:5," and "P+D:10," and as "P+D:X" when referenced as a group. In Figure 3 we display the central graphic for the P+D:1 message. The P+D:5 and P+D:10 graphics are different only in their donation amounts. Each non-Null treatment included a block of fine print that described the WUSF ("a group of private individuals committed to assisting the [NPO] in achieving its mission"), stated that the donation offer was limited to one per customer, and specified that there was no maximum total donation from the WUSF.

In addition to the WUSF donation pledges on the front page's central graphic, we placed condensed versions of each message near the top of the store's product-level pages. In Figures 4 and 5 we display these condensed messages for the P:1 and P+D:1 treatments. Consumers who were assigned the Null treatment received no message in this space. We included these reminders in case a consumer clicked past the store's front page without reading the text in the central graphic.

In order to handle potential consumer confusion about the donation messages, the NPO provided a phone number for customer service. The NPO's customer service employees were prepared to give callers additional information about the donation pledges, but the NPO reported that no consumers called to request this information.[6] The absence of phone calls provides some evidence that consumer exposure to multiple experimental treatments is not a serious concern.

The central goal of these messages is to allow investigation of how demand shifts with the charitable value of products. First consider the P:1 and P:5 messages. Due to the large proportion of store customers who purchase more than $10 of merchandise in the absence of the messages, we expected that these messages would shift behavior primarily at the extensive margin, i.e. by attracting more consumers to purchase from the store. Consumers who were willing to purchase even without a WUSF pledge typically do not trigger an additional WUSF

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[6] The customer service representatives were also instructed offer a consumer the discounted set of prices if the consumer saw both price levels and was confused by the difference. No consumers called with questions about the prices.

donation by increasing the size of their order. The rationale is similar for the P+D messages, with the additional feature that these messages were intended to stimulate donation decisions while consumers were in the store. The pledged WUSF donation effectively lowered a consumer's "price" ($10) of a $11, $15, or $20 donation. The P+D:X messages also may affect behavior by reminding potential store customers that the NPO is an organization that warrants their support.

To understand the benefits of using the lump-sum WUSF donations rather than another mechanism that affects consumers' beliefs about charitable value, consider a few alternatives. First, it is possible to simply tell consumers that a $30 item includes an implicit donation of either $3 or $6 to the NPO's mission. One potential problem is that only one (at most) of the two donation amounts can be true without outside funding. A second problem is that without describing the presence of outside funding, consumers may make different inferences about the underlying quality of the product being sold – in this example that the item's cost is either $27 or $24. Second, we might have used varying percentage donations from the WUSF, for example that the WUSF would donate 1%, 5%, or 10% of a customer's order value. While this scheme has the benefit of resembling some firms' actual pledges of donations in proportion to sales, there are two drawbacks for the present setting. The first problem is that a small number of store customers place very large orders (several thousand dollars), and paying pledged WUSF donations in these cases could be prohibitively costly. The second issue is that it would be tempting to ascribe changes in the size of consumers' purchases to variation in the marginal benefit of purchasing additional products. As we mentioned above, consumers are willing to increase their purchase sizes even in situations with no apparent marginal financial benefit from WUSF donations, but the result could be obscured with a proportional WUSF donation.

2.B.ii. Price variation

To assess how price sensitivity changes with the strength of charity association, we randomly assigned consumers to either the regular (non-sale) store prices or discounted prices. Of the 45 items offered at the store, we received permission to adjust prices on 20 items, which represents about half of the store's sales. When the discount was applied, the prices of these 20 items were

reduced by 8-20% relative to the control.[7] Focusing on items that were potentially discounted during the experimental period, the (weighted) average regular price was $32.20 and the average discounted price was $28.54. The 25 items that were not subject to discounting had an average price of $15. Other than the price levels, the discounted prices had the same appearance as the regular prices. No additional messages about sale prices were displayed.

3.   Data

3.A.   Reports from the online store

After the experiment ended, the NPO provided data on activity at the online store. These data capture activity at two levels. First, we observe basic information about every visit ("session") to the online store. For each session, we observe the time and date it was initiated, the assignment into an experimental treatment, the visitor's Internet Protocol (IP) address, the visitor's approximate location based on their IP address, and the individual products viewed by the visitor. Through the cookie stored on a consumer's browser, we are able to track consumers' repeat visits to the store. The second level of data is for consumers' purchases. For each consumer who placed an order at the store, we observe all session-level details listed above, the items selected and prices paid, any donation activity within the store, and the consumer's billing zip code. We use consumers' email addresses (which are entered during check-out) as an additional way to link individual consumers' activity across multiple transactions at the store.

The personal information, browser cookies, and identification codes of online store visitors were not used by the NPO or the researchers for any purpose other than the academic study we describe in this paper.

3.B.   Consumer activity at the store

During the experimental period of there were about 6,200 sessions initiated for each of the twelve treatments. These initiated sessions represent approximately 5,800 consumers per treatment that we examine in this paper.[8] Some of the difference between the total sessions and

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[7] Variation in discounting percentages is generally due the goal of reducing prices in whole-dollar increments. The NPO's marketing group provided extensive input in selecting the discounted prices.

[8] We investigated sessions (and subsequent orders) that were initiated in rapid succession from the same IP address, with the store visitor apparently deleting their browser cookies between each session. This may be due to testing of the website by the NPO or ourselves, or it may be consumers who realize that the store appearance changes each time they delete cookies and begin a new session at the store. About 4% of store orders follow from a session

studied consumers is due to consumers making multiple visits to the store before purchasing. On average, consumers who did not order visited the site 1.07 times during the experimental period, while consumers who ordered visited 1.59 times. Other store visits are eliminated because of short-term disruptions in our treatment-assignment mechanism. Finally, for each consumer who purchased multiple times within the experimental period (and under a single treatment), we aggregate all orders into a single observation.

About 2% of store visitors placed orders, with an average order size of $87.70. This implies that each unique store visitor generated $1.76 in revenue for the NPO. These values and similar statistics in this paper include only merchandise and exclude shipping charges. Due to a small number of very large orders, the median order is $37, considerably below the mean.[9] When we drop the orders above the 95th percentile ($225) of all order values, the average order falls to $50 for a per-visitor average of $0.95. In the analysis below we often utilize similar truncations when comparing consumer activity across treatments. We do this to focus on transactions that are most likely to represent the choices of households rather than firms. The truncation of order values is always performed separately at the 95th percentile within each highlighted set of observations.[10] We choose this approach to the data because it allows us to continue to draw information from the large number of $0 sessions initiated at the store.

In the top panel of Table 1 we display the number of visitors and their order values for the six experimental messages, including the Null. Regular and discounted price treatments are combined within messages in this portion of the table. Consumers' purchase probabilities are marginally greater in most of the non-Null treatments, but none of the differences are large. The more striking difference is between the average order values in Null and non-Null messages. Revenue per store visitor is $0.65 greater when consumers receive a non-Null message. This is due to a difference of $31.50 per customer conditional on an order. The difference in order sizes between the Null and non-Null messages is $8.58 when we drop the largest 5% of orders from each subsample. With and without truncating, the median order value is $40 for orders placed

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associated with this sort of activity, and these store orders are distributed fairly evenly across experimental treatments (including price discounting). This suggests that few store customers were behaving opportunistically with regard to inserting themselves into experimental treatments with more favorable terms.

[9] About 1% of orders include over $1,000 of merchandise.

[10] By performing the truncation separately for each group of data, we minimize bias due to differences across experimental treatments in what share of observations within the treatment would be above a single truncation point.

under each WUSF message except P:5, while both the P:5 and Null messages have median values just under $30.

The average order values across messages generally follow the pattern in the median order values. Excluding the largest 5% of orders, the order value per visitor for the P:1 treatment exceeds the Null by 27%, while the same statistic for P:5 is 5% greater than the Null. Each P+D:X message has an average value per visit that is substantially larger than the Null, varying from 13% to 32% greater. Despite these increases in order value, consumers in the P+D:X treatments predominantly chose to omit donations from their store visits. As shown in Table 1, about 4% of consumers who ordered under a P+D:X treatment made a donation, with the greatest number donating within the P+D:10 message. It is important to emphasize that when consumers in P+D:X treatments did not make their own donation, then no WUSF donation was triggered.[11] This regularity, along with the stronger consumer reaction to P:1 than P:5, presents a significant puzzle within the data. Why did consumers respond most strongly to WUSF messages when their actions had the least value for the NPO?

In Panel 2 of Table 1 we display average order values within the price treatments. As expected, lower prices lead to both an increased purchase probability and an increased order size per store visitor. The displayed difference in order sizes, however, understates the magnitude of consumer response to the price reductions. The revenue figures in the Table are reduced by price discounts. To capture the consumer's response in quantity units, we also calculate the size of a consumer's order at the undiscounted prices (even when the consumer actually receives a discount). Computed this way, the average truncated order value is $53.43 when the consumer receives a discount (compare to $51.44 of actual revenue), and the average truncated order value per session is $1.082 (compare to $1.005). An additional factor that complicates interpretation of Panel 2 is that the figures include products that were never discounted. When we focus on only the products that are included in the discounting portion of the experiment, we find that the chance of a store visitor purchasing at least one of these products increases from 1.06% without a discount to 1.26% with the discount in place. This is a greater proportional difference in purchase probability than when all merchandise orders are included.

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[11] Consumers who received a P+D:X message and donated have a median merchandise order size that is $5 lower than the median for consumers with P+D:X messages who did not donate. In all, the WUSF offers generated a $1,636 donation to the NPO.

Our experimental structure included equal division of consumers into the Null and each non-Null message. For some of the analysis below it is useful to compare a larger group of Null-like consumers to those who received a non-Null message. To do this, we augment the experimental data with store data from March and April outside of the experimental period.[12] Consumers who purchased from the store during these portions of March and April saw store graphics and prices similar to those in the Null portion of the experiment. Store activity during the supplemental period was similar to activity under the Null. See Panel 3 of Table 1 for summary statistics on the supplemental period. Of 31,352 visitors during this period, 2.3% of consumers placed an order (2% for the Null), and the average order value in the lower 95% of orders was $42.61 ($42.91 for the Null). Differences in the percentage of visitors who purchase may be due to promotions running during the supplemental period or general consumer shopping patterns during these portions of March and April.

3.C.   Actions after the experiment

We supplement the data on consumers' choices in March and April 2007 with information on the same consumers' interaction with the NPO between May 2007 and March 2008. Due to the anonymity of consumers who visit the store and leave without purchasing, we are limited to consumers who purchased during the experiment and supplemental periods.[13] We study two aspects of these consumers' choices. First, we collect data on the consumers' transactions at the online store. Second, we received information on donation dates and amounts from the NPO database of online donors, which does not include donations made at the store. In all, we identified 93 consumers who were active with the NPO outside of the experimental period. Most of these consumers (75) were repeat customers of the store but not donors, and only 1 consumer appeared in both the follow-up store data and the donation data.

In examining a consumer's actions after the experimental and supplemental periods, we focus on transactions that occurred between 60 and 300 days after the consumer's last action

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[12] We exclude consumers who visit the store on April 16-17 to minimize the impact of consumers who first visited the store during the experimental period and were exposed to one of our WUSF messages. Due to data limitations, we also exclude consumers who entered the store on March 1 and after April 27.

[13] After the experimental period no new cookies were placed on consumers' web browsers, and the cookies that were placed during the experiment expired soon after its conclusion.

during March and April 2007. We do this so that there is no overlap between subjects in the experimental period and supplemental period.[14]

On Table 2 we provide summary statistics on these consumers' purchases outside of the experimental and supplemental periods. Consumers who ordered multiple times after the experiment have their orders summed.   Average order totals across consumers are influenced by a few large values, so we report both the average and median order on Table 2. Consumers who saw the Null message or were in the Supplemental group purchased at a rate of 2.7%, while 4.3% of consumers who received a WUSF message returned to purchase. In the analysis below we condition our analysis on consumers who were in the lower 95% of all orders within the experiment and comparison period. This removes a few consumers who contribute to the statistics on Table 2.

Considerably fewer store consumers appear in the NPO's roll of online donors. This donor database contains over 2 million names and accounts for a large share of the organization's donation revenue. Despite this, only 24 of the 2,116 customers from March and April 2007 were located in the donor database, with 18 consumers making donations after April 2007. There were 12 consumers (1% of 1169) who saw a WUSF message and donated later, and 6 consumers (.7% of 947) who donated after seeing the Null message or were a part of the supplemental group. While we forgo further empirical analysis of donation patterns because of the small number of observed consumers, the scarcity of these consumers may be considered a result in itself. This suggests that the NPO's collections of store customers and donors are largely distinct, and charity-oriented promotions at the online store are likely to have little impact on donation activity. The WUSF messages' sizable impact on order sizes has little opportunity to affect donation revenue.

3.D.   Consumer demographics

Although consumers' assignment into experimental treatments was random, we may improve our understanding of what drove differences in consumer choices by looking at the demographics of those who did place orders. We do this with data based on consumers' zip codes. All data are

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[14] For example, we do not want a consumer who purchases on March 10 and returns to the store on April 20 to be part of both the experimental and comparison groups. But if the March 10 consumer's actions are omitted from the analysis until 60 days after purchase, then a consumer who first arrives at the store on April 23 should be treated in the same way.

from the 2000 decennial census, which is the latest year for which this level of data is available. Note that this is a selected sample, as it includes only consumers who opted to purchase after entering the store. Our use of the demographic data, then, is to ask whether a particular WUSF message generated different sales activity because the message attracted a different set of consumers to purchase. While we would prefer to analyze demographic data for the full population of consumers who visited the store, unfortunately the location information available through IP addresses is unreliable. Instead of providing the location of the consumer's computer, the IP address provides the location of the consumer's Internet Service Provider (ISP). A consumer's ISP can be located in a different city or state that the consumer himself.

In Table 3 we compare means from a collection of economic and demographic variables, separated by experimental treatment. In comparing the characteristics of NPO customers to national averages, we see that store customers are from more populous areas with higher incomes, greater home values, and more educational attainment. Across types of experimental messages, consumers who purchased under a Null message are from geographic areas that are similar to those with non-Null customers. Some differences are apparent between the Null and P+D:X customers, which may explain some of the difference between order sizes from these groups. Within the experiment, the largest differences are between consumers who received different price treatments. Store customers who received discounted prices appear to be drawn from areas with lower incomes and educational achievement. This is reasonable considering the selection mechanism that drew consumers into the sample of active store customers. Potential customers from lower-income areas who observed undiscounted prices may be less likely to purchase, and therefore would not be represented in this sample.

4. Detailed analysis and testing

We now examine more closely the impact of the experiment on behavior. In evaluating the overall impact of the experiment, our central analysis is at the session level, which captures changes at both the extensive and intensive margins. We supplement this with detailed analysis of choices conditional on an order, as this provides an opportunity to deepen our understanding of consumers' responses. We also examine consumers' price sensitivity and whether exposure to WUSF messages affected behavior after the experiment.

4.A Impact of the experiment on order revenue

In this analysis our primary variable of interest is r, the total revenue from a visitor to the online store. Unless noted, we use Ordinary Least Squares (OLS) to estimate the effect of subsets of our experimental treatments on r. In most of the analysis below we focus on the transactions of consumers in the lower 95% of all store customers with $r > 0$.

We begin by presenting a set of session-level results in Table 4. For Specification 1 we regress r on a simple indicator of whether a store visitor saw a WUSF donation pledge. The model's constant recovers the average transaction value under the Null, 0.81, as we reported in the summary statistics of Table 1. Consumers who received any non-Null treatment spent an average of $0.16 more than consumers with the Null ($p = .08$). In Specification 2 we divide the WUSF treatments by whether a consumer's own donation was required (P+D:X) or not (P:X). We find that impact of the P+D:X treatments is significantly different from zero and larger in magnitude than the P:X treatments, which have a positive but insignificant impact on revenue per store visitor. In Specification 3 we further separate the treatment messages by their individual content, and we find that the two messages with $5 WUSF donations had the smallest impacts on store revenue; their coefficient estimates are positive but statistically insignificant. The estimates for the remaining messages range from $.22 to $.26 and each is significantly different from zero. In the remaining columns of the Table we display the impact of discounted prices on store revenue (Specification 4) and the results from a full division of treatments by WUSF message and price discount (Specification 5).

The results on Table 4 are driven by increases in spending by consumers who purchase from the store. Additional analysis (not reported here) shows no significant impact of WUSF messages on the probability of a consumer purchasing from the store, regardless of the level of aggregation across WUSF messages. But why would consumers have a stronger positive response to the (untriggered) P+D:X messages and P:1 message than the relatively rich P:5 message?[15] We suspect that the P:1 message and all three P+D:X messages acted only to shift consumers' perceptions of the store as an effective way to support the NPO, and the specific details of the WUSF offer were either unnoticed or ignored.[16] The P:5 message, by contrast, was

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[15] We show below that the P+D:5 message is more naturally grouped with the other P+D:X messages than with P:5.

[16] This explanation, however, still does not explain why there was no apparent shift in activity at the extensive margin.

simple and large enough to attract the consumers' attention and encourage them to think about the specific terms of the WUSF offer. In the analysis below we provide evidence to support this view.

To explore these ideas further, we now turn to examining order revenue conditional on an order. This approach allows a greater focus on order sizes and requires minimal sacrifice in ignoring the extensive margin. Specifications 1-3 of Table 5 replicate the structure of Specifications 1-3 of Table 4, and the qualitative attributes of the results are very similar. Within specific WUSF messages, the P:1, P+D:1, and P+D:10 treatments have significant impacts on order size, and the magnitude of these effects are similar to each other (between $10.50 and $12.50). The impact of the P+D:5 message is positive ($7.05) but not significantly different from zero. The P:5 message stands out with an estimated coefficient that is nearly zero ($0.40).

We verify the robustness of these results in the remainder of Table 5, where we take alternative approaches to the data. In Specifications 4-6 we truncate the data at the 90th percentile rather than the 95th. The estimated coefficients all fall in magnitude, but the standard errors do too as we are eliminating a set of observations that had a substantial impact on the data's variance. The key result is the parameter on P+D:5 displayed in Specification 6. This coefficient takes a value ($5.54) that is statistically significant and now more similar to the P+D:1 and P+D:10 coefficients, which are $7.59 and $7.25, respectively. This pattern is repeated in Specifications 7-9, where we use the log of order value as the dependent variable. Each WUSF message other than P:5 has a positive and significant impact on the log of order size, with the magnitudes ranging from 21.6% to 23.5%. The impact of the P:5 message, by contrast, is estimated at 6.6% and insignificantly different from zero. The differences between Specifications 7-9 and the others on this table – in the narrower range of coefficient values and the sizes of standard errors – illustrates the impact of outlier transactions on the simple dollar value of orders.

With Table 5 we established that consumers' responses to the P:5 message are different from their responses to other WUSF messages, which in turn are similar to each other. We now consider more closely what is happening within the P:5 pledge. In the analysis so far, our results suggest that consumers' responses to the P:5 message may be no different than their responses to the Null. If consumers are simply ignoring the P:5 message, then we would expect them to have the same probability as Null recipients of falling below the $10 purchasing threshold necessary

to trigger the WUSF donation. Overall, a small fraction of store orders (about 3% in total and 6% under the Null) have values below $10. In Specifications 1-3 of Table 6 we present results on the probability that a consumer's order is below $10. The main result is in Specification 3, which shows that consumers assigned to P:5 were significantly less likely miss the $10 threshold than those who received the Null. This is consistent with consumers responding to the marginal incentives of the P:5 message only when doing so is relevant for NPO revenue.[17] Consumers who received other WUSF messages respond similarly, which may be explained by an overall demand shift following the receipt of a message, as would occur when consumers' general perception of the NPO store is improved.

In the remaining specifications on Table 6 we continue to investigate whether consumers who received the P:5 message behaved differently than those who received the Null. We divide consumers' orders by whether they included any merchandise item with a price below $10. Our conjecture is that a consumer who buys an item priced below $10 has a greater chance to fall below the P:5 message's $10 threshold, provided that the consumer buys one unit of that item and nothing else. Consumers who are interested only in items with prices above $10 have no chance to fall below the threshold. In additional analysis not reported here, we have found that consumers with WUSF pledges generally increased their order value by increasing the quantity of items purchased rather than choosing items with higher prices.

In this analysis we use the log of order revenue because of the effectiveness of this transformation in reducing outliers' impact, as in Table 5. In Specification 4 we find that a WUSF message added 54%, on average, to the order size of a person who selected a sub-$10 item, and Specifications 5 and 6 show that this impact was fairly similar across WUSF messages including P:5. In Specifications 7-9 we exclude orders in which no individual items were priced less than $10, and we find that the impact of the P:5 message lags the other WUSF messages. The average impact of all WUSF messages, shown in Specification 7, is smaller (12.2%) than in Specification 4. In Specification 9 we find that the messages other than P:5 have effects that range from 14.4% to 18.5% and are statistically significant, while the effect of the P:5 message is estimated to be -3.9% and insignificantly different from zero. Taken together, the results of Table 6 support the view that consumers who received the P:5 message noticed its content and

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[17] Recall from Table 1 that store visitors who received the P:5 message purchased with greater probability than recipients of the Null and most other WUSF messages. The decision to purchase or not is another area where a P:5 consumer's action can affect WUSF donations to the NPO.

responded in cases when doing so mattered for the WUSF donation, but consumers did not change their actions when there was no (outside) benefit to the NPO from doing so.

4.B   Price sensitivity

A goal of is experiment was to determine whether the presence of social messages influences price sensitivity. We analyze this issue by testing whether WUSF messages affected consumers' responses to discounted prices. In order to have our analysis reflect changes in quantities purchased while also accounting for the variety of items offered at the online store, we make an adjustment to the measurement of consumers' choices. Rather than continuing to look at the total (dollar) spending of each consumer, we examine the amount that a consumer *would have spent* if she faced the undiscounted prices for the choices she actually made. This allows us to evaluate whether a consumer buys "more" in dollar-denominated units when she sees lower prices, and thus permits calculation of demand elasticity.

On Table 7 we analyze the impact of the price variation. We present four sets of results. On the left side of the table we include transactions on all items in the store. On the right side of the table we include choices on only the items that were included in the experiment's pricing component. This includes about half of all product selections and transactions made during the experiment. Consumers who only purchased items that were excluded from the pricing experiment are treated in the same way as consumers who visited the store and purchased nothing. Similarly, for consumers who selected some never-discounted and some sometimes-discounted items, only the latter items are included.

In the top half of Table 7 we examine purchase probabilities at the session level. The analysis of all transactions, on the left, reveals few useful results. The standard errors are large relative to the parameter estimates, and none of the coefficients are significantly different from zero. Specification 1 shows a positive but insignificant increase in store visitors' probability of placing an order. Specifications 2 and 3 also yield similar results – various combinations of discounts and messages had no significant effect on purchase probability. The analysis of sometimes-discounted items, on the right, is more informative. In Specification 4 we report a positive and significant increase in the probability of an order when the consumer observes lower prices. The remaining Specifications in this panel show that the presence of WUSF messages did not significantly affect order probabilities. The coefficients on the interaction terms of

18

Specifications 4 and 5 are small in absolute value, suggesting little impact of WUSF messages on price sensitivity.

In the lower half of Table 7 we examine the impact of discounts on total spending by session, using undiscounted prices to calculate price-weighted units selected by consumers. We find that when all sales are grouped together regardless of WUSF message (Specification 7), discounts have a significant and positive effect, increasing order size by about 22% per store visitor. The interaction coefficients in Specifications 8 and 9 indicate that the WUSF messages – especially those with P:X offers – generated a positive but statistically insignificant increases in the price sensitivity of online store customers. Our estimates in the lower right portion of the table are more precise, as expected, but fail to uncover significant variation in price sensitivity with exposure to WUSF messages. The overall measure of price sensitivity in Specification 10 is positive and significant at $p < 0.01$. This increase of 36.8% in quantity, when paired with an average discount size of 11.4%, implies a demand elasticity of -3.1 for items at the NPO store.

During discussions with the online store managers we discussed their costs of acquiring and processing items available at the store, and we learned that the estimated demand elasticity implies that current pricing practices approximately satisfy the inverse elasticity pricing rule for profit maximization. Prior to our conversations, the managers were unaware of the rule and had little familiarity with demand elasticity as a method to calculate price sensitivity. The "profit" maximizing pricing strategy is optimal if the store's objective it to maximize revenue that can be transferred from the store to the NPO's charitable efforts.

Although the average effects of price discounts, as measured in Table 7, did not uncover significant differences in demand elasticity with and without WUSF messages, these results may be driven by the price sensitivity of a few large customers.[18] We now turn to an informal analysis of how price variation affected the median consumer within an experimental treatment. We focus on choices over products that were included in the discounting portion of the experiment, and we consider pre-discounted order values rather than actual revenue.

There were 59 consumers who purchased potentially-discounted items after receiving the Null and observing undiscounted prices. The median order value was $30 for these consumers. Consumers who received discounted prices and the Null message were more numerous (67) and

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[18] In contrast to the donation pledges of the WUSF messages, the discounting portion of this experiment shifted financial incentives for both large and small purchases.

had a greater median order value ($39.95). If each consumer who purchased under the Null was to place an order equal to the median value from his or her respective group, then the total order value would increase by 51% with discounting.   For consumers who received a WUSF pledge, the median order value was $39.95 regardless of whether the consumer observed discounted prices.   There were 313 consumers who received a WUSF message and purchased without discounted prices, and 367 consumers who purchased with both a WUSF pledge and the reduced prices. If each consumer were to select the median order value, then total order value would be only 17% greater with discounted prices. In contrast to the results on Table 7, this suggests that charitable messages may reduce price sensitivity among households making relatively small purchases.

4.C   Long-term effects of the experiment

While the WUSF messages led to a substantial increase in store revenue during the experiment, a potential concern is that this increased activity comes at the expense of other support that consumers may offer the NPO. Consumers could substitute intertemporally and reduce future spending at the store after they purchase under a WUSF message, as occurred in Meier's (2007) study of stimulating direct donations. Consumers may also reduce direct donations to the NPO because they see those donations as a substitute for NPO merchandise.[19] We address this issue by examining consumers' behavior in the year that followed our experimental messages. While it would be ideal to analyze all consumers who viewed an experimental message while visiting the online store, we are limited to consumers who purchased from the store. Our examination of consumers who purchased is aided by the minimal impact of the WUSF messages on order probabilities, so each observed group contains roughly the same percentage of treated consumers (i.e. those who initiated sessions at the store).

Of the 1,328 consumers who purchased under the experiment and were in the lower 95% of orders (divided by type of message or Null), 50 returned to the store in the following year and placed another order.[20] Of these 50, only 4 received the Null message during the experiment. These 4 returning consumers come from a group of 216 who purchased under the Null and were

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[19] Duncan (1999) explores the closely related topic of consumer substitution between donations of time and money, and he uncovers some intrapersonal crowding-out between the two activities.

[20] The consumers listed in Table 2 include those who were in the upper 5% of orders during March and April 2007.

in the lower 95% of orders. Once we add the comparison group described in Section 3, we observe a total of 69 consumers who made follow-up purchases from the store, and a total of 2,011 consumers from March and April to consider as potentially-returning customers.

We test for differences between consumers who received WUSF messages and others in Table 8. We begin by examining the probability of a return to purchase. In Specification 1 we separate consumers who are in the Null and comparison groups, and we group together all consumers who placed an order after receiving a WUSF message. We find that the comparison group returns at a slightly higher rate than the Null group, but this difference is not significantly different from zero. By contrast, the consumers who purchased with a WUSF message are more than twice as likely to return to the store and purchase at least once. In Specification 2 we combine the Null and comparison groups and again find that the consumers who saw a WUSF message are more likely to return to the store and purchase again. Our results in Specification 3 show that this effect is comes primarily from the P:X group.

In the remainder of Table 8 we examine the revenue from consumers who returned to the store. The dependent variable is the sum of an individual's spending during all return visits to the store, and we include the $0 outcomes of consumers who chose not to return. In Specifications 4 and 5 we report that consumers who received a WUSF message spent significantly more than those who purchased under the Null or in the comparison period. In Specification 6, where we separate the WUSF message by type, we find that both P:X and P+D:X messages induced consumers to return and spend significantly more than consumers who received no WUSF message. The difference between Specifications 3 and 6 is that the consumers who did return under P+D:X spent considerably more than those in the Null and comparison group, even though similar share of consumers returned to the store. In all, Specifications 1-6 of Table 8 indicate that the WUSF pledges created no compensatory downward shift in demand following the experiment. Instead, the evidence supports our interpretation of how most WUSF messages affected store orders during the experiment – the messages caused consumers to update their perception of the NPO's quality or the value of its charitable cause.

We conclude this section with a final observation about the P:5 message, which appeared distinct from all other WUSF pledges in our earlier analysis. Recipients of the P:5 pledge returned to the store at a rate of 2.14%, which is slightly lower than the rate of the combined Null

and comparison group. The average return spending per consumer, however, was substantially greater under P:5 ($3.31) than under the Null and comparison ($1.27). While there are few observations from which to draw inferences, there is no evidence here that consumers will reduce their later demand when their attention is drawn to the details of an offer, as in the case of the P:5 message.

5.   Conclusions

In our field experiment, we find that consumers respond strongly and positively to products that generate revenue for social causes or public goods. Consumers' responses to these products, however, depend on the details of how this revenue is generated. We find that consumers' demand responses are strongest when the explicit financial benefit to the NPO is small or requires extra actions that the consumers do not take. When the NPO's additional financial benefit was relatively large and simple to trigger, the demand response was nearly zero. The difference in responses appears to be due to consumers examining the details of a revenue-generating opportunity only when doing so is justified by the opportunity's stakes and consumers' likely actions.

The weakness of consumers' responses when explicit incentives are most salient is similar to the results of Frey and Oberholzer-Gee (1997), who study the circumstances under which Swiss citizens are willing to accept a nuclear waste facility near their homes. Frey and Oberholzer-Gee find that the surveyed citizens responded more strongly to an appeal to national duty and the public good (i.e. intrinsic reward) than to financial compensation (i.e. extrinsic reward). In the present experiment, we interpret consumers' responses to the WUSF messages other than P:5 as motivated by warm but vague sentiment, but this can be replaced by a weaker motivation once financial incentives attract consumers' attention.

Our results are also related to recent findings on direct donation decisions, in which the choices of one individual may be sensitive to the nature and extent of other consumers' actions in supporting the same public good. The results in Eckel and Grossman (2003), Karlan and List (2007), and Sen and Croson (2006), described above, are consistent with consumers being aware that they hold imperfect information about a charitable organization's or cause's quality, and positive information on others' support leads consumers to update their quality inferences. The WUSF pledges in our study may have the same effect. The presence of a P+D:1 pledge, for

example, may be relevant to consumers only in that it indicates that some other individuals thought it was worthwhile to create such an offer.

For firms considering associations with social causes, our results are clear but perhaps dispiriting for the beneficiary charities. A small donation pledge can stimulate demand more than a large one, and a vague promise of good deeds can be more effective than a specific pledge. These prescriptions, however, depend on how consumers interpret messages about charitable actions. This is an important area for future research. In addition, studies of longer duration and of greater scope would provide useful data on whether the demand stimulation reported here can be replicated as part of a long-term strategy for a firm or nonprofit. While we found only positive or neutral long-run effects from our experimental treatments, our results came from the activity of a relatively small number of consumers who were exposed to a brief demand stimulus.

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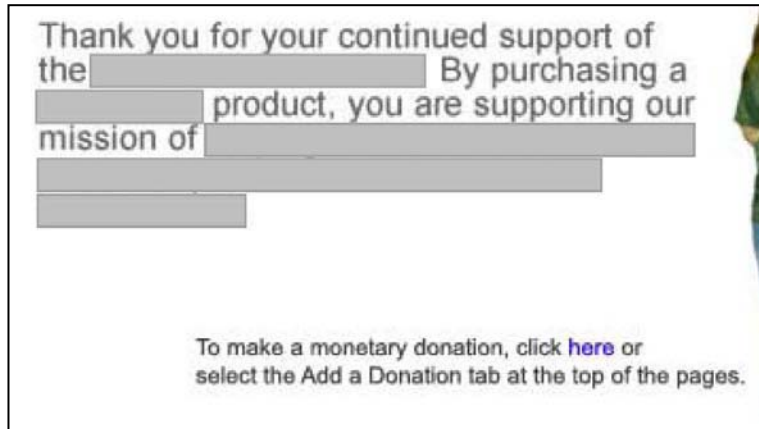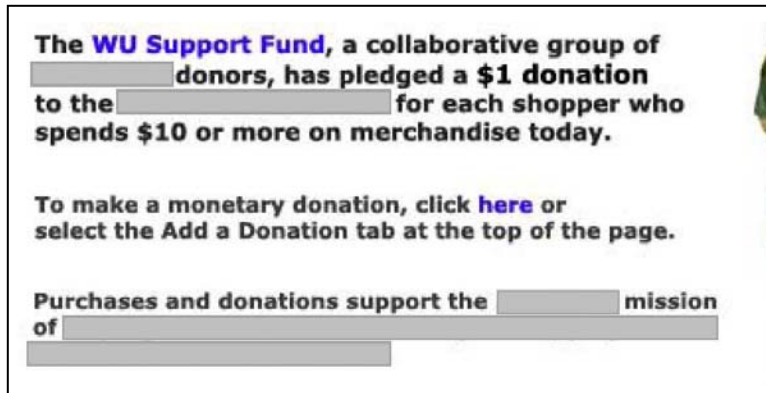
Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Table 1
Summary statistics

	Number of Visitors	Number of Orders	Purchase Probability	Average Order per Visit	Avg. Order per Visit, Large Orders Excluded	Average Order Size	Median Order Size	Avg. Order, Large Orders Excluded	Number of Donations
				Panel 1: Activity by message					
Message Type									
Null	11,397	226	1.98%	$1.216	$0.810	$61.31	$28.00	$42.91	2
P:1	11,887	232	1.95%	$1.701	$1.030	$87.14	$39.95	$55.36	2
P:5	11,752	243	2.07%	$1.647	$0.852	$79.63	$29.90	$43.32	3
P+D:1	11,457	233	2.03%	$2.529	$1.074	$124.90	$40.00	$55.64	7
P+D:5	11,489	221	1.92%	$1.435	$0.914	$74.62	$40.00	$49.97	7
P+D:10	11,488	240	2.09%	$2.034	$1.062	$97.35	$39.95	$53.46	16
				Panel 2: Activity by pricing treatment					
Discount?									
No	35,111	688	1.96%	$1.671	$0.886	$85.25	$37.90	$47.54	18
Yes	34,359	706	2.05 %	$1.851	$1.005	$90.09	$37.00	$51.44	20
				Panel 3: Supplemental data					
	31,352	720	2.30%	$1.469	$0.925	$63.96	$28.00	$42.61	9

Notes: "Large Orders Excluded" statistics are calculated after eliminating orders above the 95th percentile of non-zero orders within the subsample utilized in each row. The supplemental data are from visits to the store in March and April that occurred outside of the experimental period.

Table 2
Post-experiment purchases

	Consumers with orders	Share of subjects	Average total orders	Median total orders
Messages				
Null	5	.022	$54.54	$48.50
P:1/5	15	.032	$165.12	$56.00
P+D:1/5/10	35	.050	$109.85	$42.50
Supplemental data	21	.029	$56.82	$40.00
Null + Supplement	26	.027	$56.39	$44.25

Table 3
Demographic characteristics by zip code

	N	Mean Population	Per Capita Income	Median Home Value	Upper Quartile Home Value	Median Age	High School Grad %	College Grad %
All zip codes		9,015	19,157	104,709	143,613	37.8	78.7	18.0
Messages								
Null	216	27,426	27,348	205,595	275,265	36.5	85.4	33.1
P:1/5	459	27,775	27,402	205,319	268,940	35.8	85.9	34.1
P+D:1/5/10	679	27,162	28,327	217,678	289,633	36.4	85.6	34.6
Discount?								
No	670	27,290	28,698	219,248	292,182	36.3	86.2	35.5
Yes	684	27,532	27,034	204,031	268,713	36.1	85.2	33.0
Supplemental data	783	26,890	28,391	208,863	280,927	36.6	86.0	34.1

Notes: The first row of statistics is an unweighted average across all zip codes in the US. In the remaining rows, N is the number of consumers who placed orders under the circumstances described in the left column. Within each row we average the zip code-level demographic data for each consumer in N. The home value variables are top-coded at $1m, which distorts some comparisons across treatments.

Table 4
Impact of treatments on order size ($) by session

Specification	1	2	3	4	5
Constant	.810*** (.085)	.810*** (.085)	.810*** (.085)	.886*** (.048)	.826*** (.122)
Any Message	.163* (.093)				
Any P:X Message		.123 (.103)			
Any P+D:X Message		.198** (.098)			
P:1			.220* (.122)		.083 (.170)
P:5			.041 (.122)		-.019 (.172)
P+D:1			.264** (.123)		.092 (.173)
P+D:5			.104 (.123)		.243 (.173)
P+D:10			.252** (.123)		.212 (.173)
Discount				.119* (.068)	-.032 (.174)
Discount × P:1					.251 (.170)
Discount × P:5					.092 (.171)
Discount × P+D:1					.312 * (.173)
Discount × P+D:5					-.314* (.173)
Discount × P+D:10					.050 (.173)

Notes: Omitted category is Null message and No Discount, as appropriate. Total number of observations is 69,401.
*** Indicates 1% significance. ** Indicates 5% significance. * Indicates 10% significance.

Table 5
Impact of treatments on order size ($) conditional on order

Dependent Variable	Order Value ($)			Order Value ($)			Log(Order Value)		
Conditions	Lower 95% of Orders			Lower 90% of Orders			Lower 95% of Orders		
Specification	1	2	3	4	5	6	7	8	9
Constant	42.92*** (2.95)	42.92*** (2.96)	42.92*** (3.06)	38.10*** (2.16)	38.10*** (2.20)	38.10*** (2.22)	3.427*** (.054)	3.427*** (.054)	3.427*** (.054)
Any Message	7.94** (3.22)			5.31** (2.36)			.190*** (.059)		
Any P:X Message		5.86 (3.60)			4.20 (2.67)			.146** (.065)	
Any P+D:X Message		9.64*** (3.41)			6.65*** (2.53)			.224*** (.062)	
P:1			12.44*** (4.30)			7.83** (3.12)			.234*** (.076)
P:5			0.40 (4.25)			0.17 (3.09)			.066 (.075)
P+D:1			12.47*** (4.30)			7.59** (3.12)			.216*** (.076)
P+D:5			7.05 (4.36)			5.54* (3.16)			.225*** (.077)
P+D:10			10.54** (4.27)			7.25** (3.10)			.235*** (.075)
N	1,327	1,327	1,327	1,258	1,258	1,258	1,325	1,325	1,325

Notes: Omitted category is Null message. *** Indicates 1% significance. ** Indicates 5% significance. * Indicates 10% significance

Table 6
Further details on order size ($) conditional on order

Dependent Variable	Order has Value < $10			Log(Order Value)			Log(Order Value)		
Conditions/Method	Probit Marginal probabilities			Order in lower 95%, includes items below $10			Order in lower 95%, no items below $10		
Specification	1	2	3	4	5	6	7	8	9
Constant				3.000*** (.154)	3.000*** (.154)	3.000*** (.154)	3.510*** (.057)	3.510*** (.057)	3.510*** (.057)
Any Message	-.036*** (.017)			.540*** (.168)			.122** (.062)		
Any P:X Message		-.021** (.010)			.571*** (.179)			.064 (.069)	
Any P+D:X Message		-.031*** (.012)			.571*** (.185)			.165** (.065)	
P:1			-.015 (.009)			.498** (.216)			.185** (.080)
P:5			-.021** (.008)			.601*** (.213)			-.039 (.079)
P+D:1			-.015 (.009)			.453** (.217)			.171** (.080)
P+D:5			-.033*** (.007)			.642*** (.225)			.144* (.080)
P+D:10			-.021* (.008)			.526** (.225)			.174** (.079)
N	1,395	1,395	1,395	215	215	215	1,112	1,112	1,112

Notes: Omitted category is Null message. *** Indicates 1% significance. ** Indicates 5% significance. * Indicates 10% significance

Table 7
Price sensitivity and donation pledges

Specification	Probability of purchase: Any item			Probability of purchase: Discounted item		
	1	2	3	4	5	6
Predicted Probability	.020	.020	.020	.012	.012	.012
Any Message		-.0012 (.0021)			.0004 (.0016)	
Any P:X Message			-.0016 (.0022)			.0003 (.0018)
Any P+D:X Message			-.0009 (.0021)			.0004 (.0017)
Discount	.00095 (.00106)	-.0016 (.0026)	-.0016 (.0026)	.0020** (.0008)	.0016 (.0020)	.0016 (.0020)
Discount × Any Msg		.0030 (.0030)			.0005 (.0022)	
Discount × Any P:X Msg			.0039 (.0036)			.0002 (.0024)
Discount × Any P+D:X Msg			.0026 (.0032)			.0007 (.0024)

Specification	Undiscounted Order Value, Lower 95%			Undiscounted Order Value of Discounted Items, Lower 95%		
	7	8	9	10	11	12
Constant	.886*** (.050)	.826*** (.127)	.826*** (.127)	.513*** (.042)	.432*** (.115)	.432*** (.115)
Any Message		.127 (.139)			.149 (.126)	
Any P:X Message			.033 (.155)			.173 (.140)
Any P+D:X Message			.194 (.147)			.132 (.133)
Discount	.197*** (.072)	.028 (.181)	.028 (.181)	.189*** (.060)	.097 (.016)	.097 (.016)
Discount × Any Msg.		.114 (.197)			.083 (.179)	
Discount × Any P:X Msg.			.213 (.220)			.055 (.199)
Discount × Any P+D:X Msg.			.046 (.208)			.103 (.189)

Notes: Omitted category is Null message and No Discount, as appropriate. Total number of observations is 69,470 for probabilities and 69,401 for order values. Probit estimates are marginal probabilities.
*** Indicates 1% significance. ** Indicates 5% significance. * Indicates 10% significance.

Table 8
Post-experiment activity

	Probability of Later Order			Average Value of Later Order		
Constant				.687 (1.885)	1.270 (.923)	1.270 (.923)
Predicted Probability	.033	.035	.035			
Any Message	.0255* (.0151)	.0158* (.0079)		3.812* (2.060)	3.228*** (1.242)	
Comparison Period	.0134 (.0185)			.768 (2.162)		
Any P:X Message			.0237** (.0107)			3.610** (1.149)
Any P+D:X Message			.0065 (.0117)			2.660* (1.597)
Null combined with comparison period?	N	Y	Y	N	Y	Y

Notes: Omitted category is Null message or Null+Comparison, as appropriate. Total number of observations is 2,011.   *** Indicates 1% significance. ** Indicates 5% significance. * Indicates 10% significance.