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TESTING FOR ALTRUISM AND SOCIAL PRESSURE IN CHARITABLE GIVING*

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Every year, 90% of Americans give money to charities. Is such generosity necessarily welfare enhancing for the giver? We present a theoretical framework that distinguishes two types of motivation: individuals like to give, for example, due to altruism or warm glow, and individuals would rather not give but dislike saying no, for example, due to social pressure. We design a door-to-door fund-raiser in which some households are informed about the exact time of solicitation with a flyer on their doorknobs. Thus, they can seek or avoid the fund-raiser. We find that the flyer reduces the share of households opening the door by 9% to 25% and, if the flyer allows checking a Do Not Disturb box, reduces giving by 28% to 42%. The latter decrease is concentrated among donations smaller than $10. These findings suggest that social pressure is an important determinant of door-to-door giving. Combining data from this and a complementary field experiment, we structurally estimate the model. The estimated social pressure cost of saying no to a solicitor is $3.80 for an in-state charity and $1.40 for an out-of-state charity. Our welfare calculations suggest that our door-to-door fund-raising campaigns on average lower the utility of the potential donors. *JEL* Codes: C93, D03, H41.

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I. Introduction

In the United States, approximately 90% ofindividuals donate money each year. There is at least one capital campaign to raise $25 million or more under way in virtually every major population center in North America. Smaller capital campaigns are even more numerous, with phoneathons, door-to-door drives, and mail solicitations increasing in popularity. Despite the ubiquity of fund-raising, we still have an imperfect understanding of the motivations for giving and the welfare implications for the giver (see, e.g., Andreoni 2006).

In this article, we consider two broad classes of motivations. First, individuals may enjoy giving. For example, they care about a specific worthy cause or like the warm glow of giving. Second, individuals may give, despite not liking to give to the charity, because the solicitor effectively placed them under social pressure to give. Such givers would rather avoid the personal interaction with the solicitor. The two motivations have very different welfare implications. The altruism (or warm glow) model (Becker 1974; Andreoni 1989, 1990) posits that giving is mostly supply-driven, and that it is utility-maximizing for the giver to give. Under this model, donations unambiguously enhance the giver's utility as well as societal welfare. The social pressure model (Akerlof and Kranton 2000) posits that giving is mostly demand-driven, and that giving may be utility-reducing for the giver.

We test for these two types of motivations in the context of in-person, unsolicited donation requests. Building on a theoretical model, we design a field experiment that allows us to test whether giving is welfare-enhancing or welfare-reducing for the giver. We complement the reduced-form experimental evidence with structural estimates of the model parameters. The structural estimation allows us to decompose the share of giving that is due to altruism versus social pressure and to quantitatively evaluate the welfare effects for the giver. In this way, the empirics and theory are intertwined in a manner that is rare in this literature. To our knowledge, this article is the first in the behavioral literature to provide structural estimates of welfare implications of a field experiment. Moreover, while the fund-raising set-up is specific, it showcases a general methodology and provides a first step toward better understanding the underpinnings for giving more generally.

Our field experiment revolves around a door-to-door fundraising drive for two charities, a local children's hospital, which has a reputation as a premier hospital for children, and an out-of-state charity, unfamiliar to most solicitees. Between April and October 2008, we approached 7,668 households in the towns surrounding Chicago. The crucial aspect of the experimental design is to allow individuals to sort, that is, to either seek or avoid the solicitor. In our first treatment, a flyer on the doorknob notifies households one day in advance about the one-hour time interval in which a solicitor will arrive at their homes the next day. In the second treatment, opt-out, the flyer also includes a box to be checked if the household does not want to be disturbed. We compare these two conditions to a baseline treatment, wherein solicitors approach households in the usual manner without a flyer. We estimate the treatment effects on both the share of households that open the door and the share that give.

This design allows for a simple test of (pure or impure) altruism versus social pressure in door-to-door giving. If altruism is the main driver of giving, the flyer should increase both the presence at home and giving. Because giving is utility-enhancing, givers should sort into staying at home, provided that alternative ways of donating to these charities require more effort. In addition, givers who would like to give in response to the flyer but who find it too costly to be at home should give to the charity via other means, such as mailing a check. Conversely, if social pressure is the main driver of giving, the flyer should lower both the frequency of opening the door and the frequency of giving. Since being asked to give is welfare-diminishing, potential givers should sort out of opening the door and should not give via Internet or check because these forms of donation are not subject to social pressure.

We report four main results, which are similar across the two charities. First, the flyer lowers the frequency of opening the door. Relative to a baseline rate of 41 percentage points, the share of households opening the door is 9% lower after receiving the flyer and 23% lower after receiving the flyer with an opt-out box (including the households that check the opt-out box). Second, the simple flyer does not reduce giving. However, the flyer with an opt-out checkbox decreases giving significantly, by 28% relative to a baseline of 7% for the local charity and 40% relative to a 5% baseline giving for the out-of-state charity. Third, the decrease in giving in the opt-out treatment is driven by small donations up to $10; donations above $10, instead, increase slightly (not

significantly). Fourth, there is no effect on donations via mail or Internet. In contrast to the substantial donation rates in person, only one household out of 7,668 gave through these other means.

Overall, the reduced-form estimates indicate that both altruism and social pressure are important determinants of giving in this setting, with stronger evidence for the role of social pressure. The lower frequency of households opening the door after receiving a flyer indicates that households are, on average, trying to avoid solicitors, consistent with social pressure. The lack of an effect of the baseline flyer on giving is consistent with opposing effects of altruism and social pressure approximately canceling each other out. The decrease in giving after a flyer with opt-out box supports the role of social pressure. When the cost of avoiding the solicitor is lowered (a simple check on a box suffices), giving due to social pressure decreases. This interpretation is consistent with the reduction occurring almost exclusively among small donations, which are more likely due to social pressure than large donations. The social pressure interpretation is also consistent with the lack of donations via mail or Internet.

We consider several alternative interpretations. First, flyers could be taken as a signal of lower quality of the charity. This interpretation can explain the reduction in answering the door and in giving with a flyer, but does not immediately explain why only small donations decrease, not large donations. Second, individuals might donate to send (costly) signals to themselves or to others that they are generous (Bodner and Prelec 2003; Benabou and Tirole 2006; Grossman 2010). This interpretation can explain our findings to the extent that avoiding a solicitor does not send the same negative signal as saying no to the solicitor. This explanation, however, is less consistent with the fact that 12% of households in the opt-out treatment check the opt-out box, which is a signal to the solicitor, as well as possibly to the neighbors. Third, people may dislike spending time with the solicitor, for example, because of the time involved, despite wanting to donate in principle. These potential donors, however, when alerted of a campaign by a flyer, should seek alternative ways to give that do not involve personal interaction; instead, we observe no such substitution.

To assess the welfare effects of giving, we structurally estimate the model parameters. We combine data from the treatments with complementary field experiments on the value of time, run in the same geographical areas in 2008 and 2009. These

experiments are designed to estimate a key parameter in the fund-raising treatments, the sensitivity of home presence to incentives, which is otherwise identified only parametrically. We ask 11,900 households to complete a survey and vary the payment ($0, $5, or $10), the duration (5 or 10 minutes), and whether the surveys are announced (with a flyer, with or without opt-out option). Higher payments and shorter duration increase the presence at home up to 16% and increase survey completion by 17–82%.

We use a minimum-distance estimator on the combined data from the charity and the survey experiments. The estimator minimizes the distance between the moments predicted by the model and the observed moments. The moments are the probabilities of opening the door, giving different amounts, completing a survey, and opting out. Key parameters are the share of altruists, the curvature of the altruism function, and the social pressure cost of saying no in person to a solicitor. We estimate that 75% of solicitees have no altruism toward the charities, but there is substantial heterogeneity. Among the altruists, the utility from giving due to altruism is steeply concave in the amount given, with almost no predicted donation above $50, consistent with warm-glow rather than pure altruism. The estimated social pressure cost of giving zero is $3.75 (and significantly different from $0) for the in-state charity and $1.44 (marginally significant) for the out-of-state charity. As a result of social pressure, a majority of donors give more than they would have liked to. Half of donors derive negative utility from the fund-raising interaction and would have preferred to sort out.

Given the large social pressure costs, our door-to-door campaigns lower the utility of the solicited households on average. In the benchmark specification, a visit is estimated to lower welfare by $1.10 per household contacted for the in-state charity and by $0.44 for the out-of-state charity. The more negative welfare impact for the in-state charity is counterintuitive because more people are willing to donate to this better-liked charity. At the same time, however, the social pressure cost of saying no is also significantly higher for the local charity, and the second force dominates.

If we take our fund-raising campaigns to be representative of door-to-door solicitations, unsolicited campaigns lead to utility losses for the givers in the order of hundreds of millions of dollars. The campaigns may still increase overall welfare, though only if the charities spend the money very effectively; in our campaign,

we raised net donations of only $0.24 per household contacted for the in-state charity, and no net donation for the out-of-state charity.

An important qualification is that our design identifies reasons for marginal, as opposed to infra-marginal, giving. Households that do not give to our fund-raiser, or give only due to social pressure, likely contributed to other charities. The motives for giving identified in this article may not generalize to infra-marginal giving, which is more likely motivated by altruism and desire for status. By the same token, however, it would be a mistake to ignore the high-pressure giving requests studied herein, or to assume that the motives for infra-marginal giving studied in the literature apply. Small capital campaigns, like the one studied in this article, are common and reveal a different facet of the motivations for giving.

Our findings can be used as an argument to introduce a do-not-solicit or do-not-call list for charities. However, they also suggest an alternative: providing households with the opportunity to sort or, even better, opt out. Introducing sorting opportunities in fund-raising limits or eliminates altogether, the welfare losses for the solicitees. Interestingly, introducing sorting can also increase charitable fund-raising, and be a win-win solution: even a limited amount of sorting in of altruistic givers, who give larger amounts, is likely to counterbalance the sorting out of givers motivated by social pressure, who give smaller amounts.

A methodological contribution of this article is the close tie between the behavioral model and the field experiment, allowing for structural estimation of the underlying parameters, which is surprisingly rare. Of all field experiments published in top five journals from 1985 to 2010, only two have this feature (Card, DellaVigna, and Malmendier 2011). A small literature in *structural behavioral economics* estimates behavioral models on observational data, including Laibson, Repetto, and Tobacman (2007) and Conlin, O'Donoghue, and Vogelsang (2007).

Our article adds to several other strands of literature. It provides field evidence about social preferences to complement the laboratory evidence (Fehr and Gächter 2000; Charness and Rabin 2002; and especially Dana, Cain, and Dawes 2006; Lazear, Malmendier, and Weber forthcoming). The study also relates to the empirical and theoretical literature on optimal fund-raising (e.g., List and Lucking-Reiley 2002; Andreoni 2006; Landry et al. 2006; Ariely, Bracha, and Meier 2009; Croson and Shang 2009;

Fong and Luttmer 2009). Finally, it adds to the literature on social pressure (Asch 1951; Milgram 1963; Garicano, Palacios-Huerta, and Prendergast 2005; Gerber, Green, and Larimer 2008; Mas and Moretti 2009).

The rest of the article proceeds as follows. In Section II we present a simple model of giving with altruism and social pressure. We introduce the experimental design in Section III and discuss the reduced-form results in Section IV. In Section V, we structurally estimate the parameters. In Section VI, we discuss alternative interpretations. Section VII concludes.

II. Model

We model the behavior of an individual whose home is visited by a fund-raiser. We distinguish between the standard case of an unanticipated visit and that of an anticipated visit. In the latter case, a flyer announces the visit and the individual can alter the probability of being at home and opening the door. We discuss here the setting and predictions. The technical details, including Lemmas are in the Appendix, and the proofs are in the Online Appendix.

II.A. Setup

We consider a two-stage game between a potential giver and a solicitor. For convenience, we denote the potential giver, or solicitee, simply as giver. In the first stage, the giver may receive a flyer of the upcoming visit and, if so, notices the flyer with probability $r \in (0,1]$. In the second stage, the solicitor visits the home. The giver opens the door with probability h. If she did not notice the flyer (or did not receive one), h is equal to a baseline probability $h_0 \in (0,1)$. If she noticed the flyer, she can adjust the probability to $h \in [0,1]$ at a cost $c(h)$, with $c(h_0) = 0$, $c'(h_0) = 0$, and $c''(\cdot) > 0$. That is, the marginal cost of small adjustments is small, but larger adjustments have an increasingly large cost. We do not require symmetry around h_0 and we allow for corner solutions at $h = 0$ or $h = 1$.

If the giver is present, she donates an amount $g \geq 0$. If she is absent, there is no in-person donation ($g = 0$). The giver can donate through other channels, such as via mail or online, after learning about the charity from the solicitor or the flyer. The giver has utility

$$U(g, g_m) = u(W - g - g_m) + av(g + \theta g_m, G_{-i}) - s(g). \quad (1)$$

The utility of private consumption, u, is derived from the pregiving wealth W minus the donations given to the solicitor (g) and through other channels such as mail (g_m). Giving through other channels g_m involves additional costs, such as finding an envelope and stamp, equal to $(1-\theta)g_m$, with $0 \leq \theta < 1$. The charity therefore receives θg_m.[1] The private utility satisfies standard properties: $u'(\cdot) > 0$ and $u''(\cdot) \leq 0$. Notice that the utility of private consumption can include the utility from infra-marginal giving to other charities.[2]

The utility of giving to the charity, v, allows for pure and impure altruism (warm glow), or prestige (Harbaugh 1998). Since the experiment is not designed to separate pure altruism, impure altruism, or prestige but altruism from social pressure, we use a specification that is general enough to encompass both. We also allow for negative social preferences, or spite (Levine 1998), towards the charity.

In the case of pure altruism, the agent cares about the total contributions to the charity, $G_{-i} + g + \theta g_m$, where G_{-i} is the giving of others. In this case, we can think of $v(G_{-i} + g + \theta g_m)$ as the production function of the charity, which is increasing in the donation g but has decreasing returns: $v'_g(\cdot,\cdot) > 0$, $v''_{g,g}(\cdot,\cdot) < 0$, and $\lim_{g\to\infty} v'(g,\cdot) = 0$. The parameter $a \geq 0$ denotes the level of altruism,[3] and the overall utility from giving is $av(G_{-i} + g + \theta g_m)$.

In the case of impure altruism, the agent cares about the warm glow from giving g. Hence, $v(\cdot)$ does not necessarily depend on the giving of others, G_{-i}, and $a \geq 0$ captures the intensity of the warm glow. We make the same assumptions $v'_g > 0$, $v''_{g,g} < 0$, and $\lim_{g\to\infty} v'(g,\cdot) = 0$.[4]

Finally, in the case of spite towards the charity, the agent dislikes giving to the charity. The utility is $av(G_{-i} + g + \theta g_m)$, with $a < 0$ capturing the intensity of spite. It is natural to assume that the disutility of giving increases with the donation in a convex

1. The key results generalize to a fixed cost of giving by mail, but the algebra is more complex.

2. We allow for giving to exceed current wealth, that is, the case $g + g_m > W$. In practice, this case is unlikely to matter.

3. The parameter a can also capture the belief of the donor about the quality of the charity.

4. Under the warm-glow model, an alternative interpretation of θ is that the charity receives the full amount g_m (i.e., there are no costs of giving via mail), but the impersonal mean lowers warm glow by a factor θ.

manner: $v'_g > 0$ and $v''_{g,g} > 0$. Here, we are abusing notation since the function v differs for $a \geq 0$ (altruism) and $a < 0$ (spite); it is concave in the first case and convex in the second. When the distinction is important, we use v^+ to denote the function for $a \geq 0$, v^- to denote the function for $a < 0$, and v to denote the function that equals v^+ for $a \geq 0$ and v^- for $a < 0$. Notice that it is important to consider the case of spite because, unlike in a standard model of giving, even spiteful individuals may give to the charity if social pressure is high enough.

The third element in the utility function is social pressure. The giver pays a utility cost $s(g) = S \cdot (g^s - g) \cdot 1_{g<g^s} \geq 0$ for not giving or only a giving small amount g while the solicitor is present. The cost is highest for the case of no donation ($s(0) = Sg^s$), then decreases linearly in g, and is 0 for donations of g^s or higher. The giver does not incur a social pressure cost if she is away from home during the visit. The special case of $S = 0$ (no social pressure) and $a = 0$ (no altruism or warm glow) represents the standard model. We further assume that the giver is aware of her own preferences and rationally anticipates her response to social pressure.

Giving in Person. We solve the model working backward. In the second stage, conditional on being at home and answering the door, the giver chooses g to maximize (1). Notice that conditional on answering the door, the giver always prefers to donate in person because mail donations involve an additional cost $(1 - \theta)$ and do not eliminate the social pressure cost.

We characterize optimal giving g^* as a function of the parameters a and S in Lemma 1A in the Appendix. (The thresholds $\underline{\underline{a}}(S)$, $\underline{a}(S)$, and $\bar{a}$ are also defined in the Appendix.) Figure I illustrates the case of linear private utility u and $v^{+\prime}(0) = v^{-\prime}(0)$, which are the assumptions used for the structural estimation. Giving g^* increases in altruism. When altruism is sufficiently low ($a \leq \underline{\underline{a}}(S)$), the individual does not give. For a higher level of altruism ($\underline{\underline{a}}(S) < a < \underline{a}(S)$), the individual gives a positive amount, but less than g^s. For even higher altruism ($\underline{a}(S) \leq a \leq \bar{a}$), there is bunching at $g^* = g^s$, which is the lowest level of giving associated with zero social pressure cost. Finally, for large enough a ($a > \bar{a}$), the donor gives more than g^s. Any giving above g^s is due to altruism (hence the threshold $\bar{a} > 0$ does not depend on the social pressure cost S), while donations smaller than g^s may be due to altruism or social pressure. Giving can occur also with

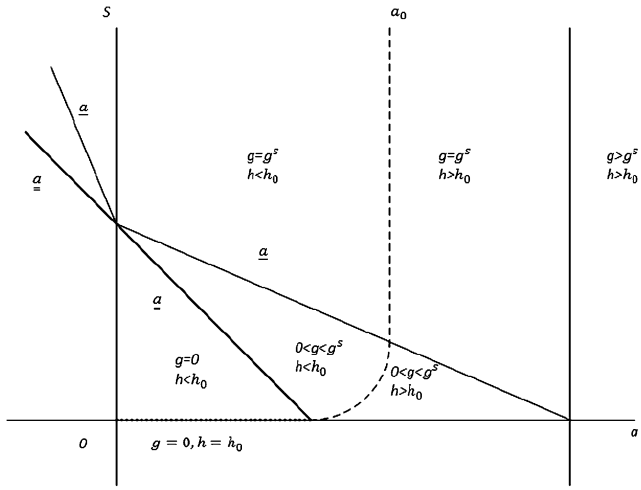

FIGURE I

Regions of Giving g and Probability of Home Presence h

Figure indicates the different regions for giving, no giving [$g = 0$], small giving [$0 < g < g^s$], giving equal to g^s, and large giving [$g > g^s$], and the different regions for the probability of being at home, avoiding the solicitor [$h < h_0$], and seeking the solicitor [$h > h_0$]. The regions are a function of the altruism parameter a and of the social pressure parameter S.

spiteful agents ($a < 0$) if the social pressure cost S is large enough ($S > u'(W)$ and hence $\underline{\underline{a}} < 0$).

Giving via Mail. Conditional on not being at home, a giver who was informed about the fund-raising via a flyer decides whether to give via mail g_m. Note that the only reason to give via mail is altruism. Giving via mail is increasing in altruism, provided $\theta > 0$. For given altruism a, the level of giving via mail received by the charity ($\theta g_m^*(a)$) is always smaller than the level of giving in person conditional on being at home ($g^*(a, S)$) (Lemma 1B).

Presence at Home. In the first stage, the giver opens the door with probability h_0 if the visit is unanticipated (no flyer or, with probability $1 - r$, despite a flyer). If the visit is anticipated (flyer), she optimizes h given her utility from being at home, $u(W - g^*) + av(g^*, G_{-i}) - s(g^*)$, and her utility from not being at home, $u(W - g_m^*) + av(\theta g_m^*, G_{-i})$:

$$\max_{h\in[0,1]} h\left[u\left(W-g^*\right)+av\left(g^*,G_{-i}\right)-s\left(g^*\right)\right]+\left(1-h\right)\left[u\left(W-g_m^*\right)+av\left(\theta g_m^*,G_{-i}\right)\right]-c\left(h\right).$$

We characterize the optimal probability of being at home, $h^*(a,S)$, in Lemma 2 (see Appendix). It is (weakly) increasing in altruism: the more the giver cares about the charity (or the warm glow), the more likely she is to be at home. The exact pattern depends on the degree of social pressure (Figure I). In the case of no social pressure ($S = 0$), sufficiently altruistic agents, $a > \underline{\underline{a}}(0)$, give if at home and actively seek to be at home ($h^* > \overline{h}_0$). The probability of being at home is increasing in the altruism up to the corner solution $h = 1$. Less altruistic agents, $a \leq \underline{\underline{a}}(0)$, instead, do not plan to give. They are indifferent as to being at home or not, and hence do not alter the baseline probability h_0.

In the case of social pressure ($S > 0$), agents with low altruism $a \leq \underline{\underline{a}}(S)$ do not give and avoid the fund-raiser in order not to pay the social pressure cost. More altruistic agents with $\underline{\underline{a}}(S) < a \leq a_0(S)$ give a small amount but prefer to avoid the fund-raiser. Their giving is either entirely or partly due to social pressure. Agents with sufficiently high altruism, $a > a_0(S)$, care enough about the charity that they seek the interaction with the fund-raiser, despite the fact that social pressure may distort their giving upward.

Opt-out. So far we have assumed that it is costly to reduce the probability of being at home. We now allow agents to costlessly reduce the probability of being at home to 0, for example, via a Do-Not-Disturb check box on the flyer. Formally, $c(0)=0$ and $c(h)$ as above for $h > 0$.[5]

Opting out does not affect giving $g^*(a)$ (conditional on being at home) or $g_m^*(a)$ (conditional on not being at home) but only the probability of being at home $h^*(a)$. As characterized in Lemma 3, $h^*(a)$ remains the same as without the opt-out option if there is no social pressure and, hence, no reason to opt out. In the presence of social pressure, however, the agent opts out for low altruism, $a < a_0(S)$, since the interaction with the fund-raiser lowers utility. For higher altruism levels, instead, the agent derives positive

5. This formalization allows a costless reduction of h to 0 but not to other levels. This is not a restriction because agents who prefer to lower h below h_0 (at a positive cost) will strictly prefer to lower h to 0 at no cost.

utility from giving. Hence, she does not opt out and the solution is the same as in Lemma 2.

Opting out also allows us to distinguish social pressure from self- or other-signaling. In our model, checking the opt-out box has no cost to the agent. Under self- and other-signalling, instead, opting out is costly since it signals avoidance of giving. If the cost is high, the agent will never opt out, and the opt-out treatment reduces to the simple flyer treatment.

Testable Predictions. To complete the model, we assume that the population of agents is heterogeneous in a with c.d.f. F. We emphasize two special cases: (i) *Altruism and No Social Pressure,* that is, the standard assumption $S = 0$, but a positive probability of altruistic individuals with $a > \underline{a}(0)$; (ii) *Social Pressure and Limited Altruism,* that is, allowing for social pressure $S > 0$, but requiring 0 probability of altruistic individuals with $a > a_0(S)$.[6]

The following propositions outline testable predictions regarding the key outcomes, home presence and giving. Our first prediction compares the probabilities of being at home in the treatments without flyer, $P(H)_{NF}$, with flyer, $P(H)_F$, and with opt-out flyer $P(H)_{OO}$.

PROPOSITION 1. With Altruism and No Social Pressure, the probability $P(H)$ is higher with flyer than without: $P(H)_F = P(H)_{OO} > P(H)_{NF}$. With Social Pressure and Limited Altruism, $P(H)$ is lower with flyer and lowest with opt-out: $P(H)_{NF} > P(H)_F \geq P(H)_{OO}$.

In the case of Altruism and No Social Pressure, the flyer increases home presence relative to the control group since some agents seek to meet the solicitor. The opt-out option has no differential effect since no one avoids the solicitor. Under Social Pressure and Limited Altruism, the opposite is true: the flyer lowers home presence as agents seek to avoid the solicitor. In this case, the costless opt-out possibility lowers the presence at home further.[7] In general, the probability of being at home is higher for the flyer group if the altruism force dominates the social pressure force, but the opt-out option always weakly lowers the presence at home.

6. In case (ii), we also require $F(a_0(S)) - F(\underline{a}(S)) > 0$ to eliminate a trivial case.

7. A sufficient (not necessary) condition for the inequality $P(H)_F \geq P(H)_{OO}$ to be strict is a positive mass of households with a in the left neighbourhood of a_0.

The next proposition illustrates the impact of the different treatments on the unconditional probability of in-person giving, $P(G)$.

PROPOSITION 2. With Altruism and No Social Pressure, the probability $P(G)$ is higher with flyer than without: $P(G)_F = P(G)_{OO} > P(G)_{NF}$. With Social Pressure and Limited Altruism, $P(G)$ is lower with flyer and lowest with opt-out: $P(G)_{NF} > P(G)_F \geq P(G)_{OO}$.

Under Altruism and No Social Pressure, the flyer and opt-out treatments lead to the same probability of giving, since there is no reason to opt out in the absence of social pressure. The probability of giving in these two flyer treatments is higher than without flyer because some agents seek to stay at home. Under Social Pressure and Limited Altruism, instead, the probability of giving is lower with flyer and lowest with an opt-out flyer. In general, the net effect of a flyer depends on whether the giving is more due to real altruism (which works to increase giving) or to social pressure (which has the opposite effect).

The third prediction regards the probability of giving conditional on being at home, $P(G|H)$.

PROPOSITION 3. The probability of giving conditional on being at home is higher with flyer than without: $\min(P(G|H)_F, P(G|H)_{OO}) \geq P(G|H)_{NF}$.

Altruism and social pressure both lead to increases in the conditional giving probability with flyer: altruistic people are more likely to be at home, and nongivers sort away from home. Hence, conditionally on reaching an agent at home, giving is higher with than without flyer.

The next proposition focuses on gift size. We distinguish between large donations, defined as $g > g^s$, and small donations, $g \leq g^s$.

PROPOSITION 4. (i) The unconditional probability of a large donation, $P(G^{HI})$, is higher with flyer than without: $P(G^{HI})_F = P(G^{HI})_{OO} \geq P(G^{HI})_{NF}$ (with strict inequality if $F(\bar{a}) < 1$). (ii) The unconditional probability of a small donation, $P(G^{LO})$, is identical under the simple flyer treatment and the flyer with opt out ($P(G^{LO})_F = P(G^{LO})_{OO}$) if $S = 0$, but higher under the simple flyer ($P(G^{LO})_F > P(G^{LO})_{OO}$) if $S > 0$ (and $F(a_0(S)) - F(\underline{\underline{a}}(S)) > 0$).

A flyer (with or without opt-out option) increases large donations given that altruistic donors increase their probability of being at home. The impact of a flyer on small donations is less obvious since small donations can reflect moderate altruism or social pressure. A flyer with opt-out unambiguously lowers the probability of small donations relative to a simple flyer, given that it simplifies the sorting out of donors motivated by social pressure.

The last proposition characterizes the probability of giving via mail.

PROPOSITION 5. The unconditional probability of a donation while not at home $P(G_m)$ satisfies $0 = P(G_m)_{NF} \leq P(G_m)_F \leq P(G_m)_{OO}$.

Without a flyer, giving via mail is zero because the giver is only informed about the fund-raiser if she is at home. A flyer informs the giver about the fund-raiser and, hence, she may give even if not at home, so long as she is sufficiently altruistic. Giving via mail is at least as high if the flyer offers opting out as with the simple flyer because some of the individuals who opt out because they would have given more than they wish in person give a smaller amount via mail.

III. EXPERIMENTAL DESIGN

Charities. The two charities in the fund-raising treatments are La Rabida Children's Hospital and the East Carolina Hazard Center (ECU). Although both charities are well-respected regional charities, we chose them so that most households in our sample would prefer one (La Rabida) to the other (ECU). To document these preferences, in our 2008 survey treatments we asked respondents to rank five charities from 1 (least liked) to 5 (most liked). The charity with the highest average rank is the La Rabida Children's Hospital (average rank 3.95) followed by Donate Life (rank 3.79), and the Seattle Children's Hospital (rank 3.47). At the bottom of the rank, below the Chicago Historical Society (rank 2.96), is the East Carolina Hazard Center (rank 2.54).[8] La Rabida appears to be highly liked both because it is an in-state charity well known to residents in the area around Chicago, and also

8. We obtain similar results when we ask the respondents to allocate $1 that *an anonymous sponsor has pledged to give* to one of the five charities. (We followed up and delivered the donations.) Out of 255 respondents, 147 pledge the donation to the La Rabida charity, and only 7 choose the ECU charity.

because it provides health benefits to children; neither condition applies to ECU.

Door-to-Door Fund-Raising. Our experiment uses a door-to-door campaign because it offers the easiest implementation of the design. While door-to-door campaigns are common and previously studied in economics (Landry et al. 2006), it is hard to quantify how much money they raise. To provide some evidence, our survey asked respondents to recall how many times in the past 12 months people have *come to your door to raise money for a charity*. We asked similarly phrased questions about giving via phone, via mail, and *through other channels, such as employer or friends*. Of 144 respondents who answered all of these questions, 76% stated that they had received at least one such visit, and 48% of respondents reported at least three such visits. This frequency is smaller than but comparable in magnitude to other solicitation forms: phone (86% received at least one call), mail (95% with at least one mailing), and other forms (83% with at least one contact).

We also asked how much the respondents gave to these solicitors in total over the last 12 months. Of the respondents, 40% reported donating to a door-to-door campaign, compared to 28% in response to phone solicitations, 53% in response to mail solicitations, and 76% in response to other solicitations. The average reported total door-to-door donation in the past 12 months (including nondonors) is \$26, compared to \$101 by phone, \$1,012 by mail, and \$2,063 by other means. However, this estimate is very sensitive to a small number of individuals reporting large sums given (in two cases \$50,000 and \$60,000) which could be due to measurement error or self-aggrandizing claims. If we cap the donations at \$1,000, the numbers are \$26 by door-to-door, \$66 by phone, \$115 by mail, and \$295 by other means. Hence, door-to-door solicitations are quite common, at least in the area where the survey took place, and they raise a smaller, but not negligible, amounts.

Logistics. We employed 92 solicitors and surveyors, mostly undergraduate students at the University of Chicago, who were paid \$9.50 per hour. All solicitors elicited contributions within at least two treatments, and most over multiple weekends, and similarly for surveyors. Each solicitor and surveyor's participation in the study typically followed four steps: (1) an invitation to work as a paid volunteer for the research center, (2)

an in-person interview, (3) a training session, and (4) participation as a solicitor and/or surveyor in the door-to-door campaign. Details about the recruitment process are in Online Appendix B.

The field experiment took place on Saturdays and Sundays between April 2008 and October 2008 (both charity and survey treatments) and then again between April 2009 and November 2009 (survey treatments only). The locations are wealthy towns around Chicago.[9] Each solicitor is assigned a list of typically 25 households per hour on a street, for a daily workload of either 4 hours (10 am–noon and 1–3 pm) or 6 hours (10 am–noon and 1–5 pm). Every hour, the solicitor moves to a different street in the neighborhood and typically enters a different treatment. Solicitors do not know whether a treatment involves a flyer, though they can presumably learn that information from observing flyers on doors. Solicitors are trained to either do charity treatments or survey treatments (with a small number trained to do both). A solicitor assigned to La Rabida on a given day will only do treatments for La Rabida, and similarly for ECU or survey.

Treatments. In the treatments without flyer, solicitors knock on the door or ring the bell and, if they reach a person, proceed through the script (see Online Appendix C). They inform the household about the charity (La Rabida or ECU), ask if they are willing to make a donation, and if they receive a gift leave a receipt. In the survey treatment, the solicitor inquires whether the household member is willing to respond to survey questions about charitable giving. The solicitor informs the household member about the duration of the survey (5 or 10 minutes) and about the payment for completing the survey, if any ($10, $5, or none).

In the flyer treatments, the solicitor's script is identical, but in addition a different solicitor leaves a flyer on the doorknob on the day before the solicitation. The professionally prepared flyer indicates the time of the upcoming fund-raising (or survey) visit within a one-hour time interval. Figure II provides examples of two flyers used for the fund-raising treatment and two flyers used for the 2008 survey treatments.[10] In the opt-out treatments, the

9. Burr Ridge, Countryside, Flossmoor, Kenilworth, Lemont, Libertyville, Oak Brook, Oak Forest, Oak Park, Orland Park, Park Ridge, Rolling Meadows, Roselle, Schaumburg, Skoke-Evanston, and Willowbrook.

10. For a small number of observations, the flyer does not indicate the exact time of the visit, only that there will be a visit in the next two weeks. Results for this subgroup are qualitatively similar to the results for the flyer with the one-hour

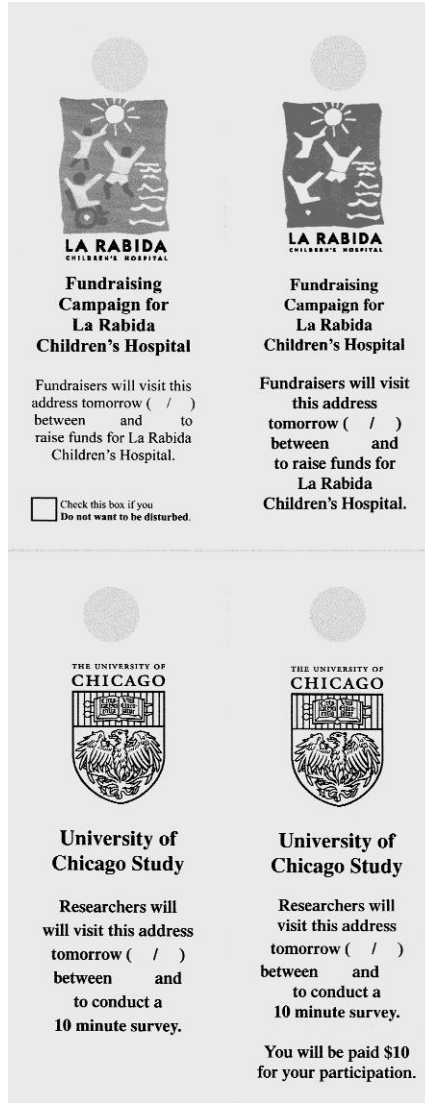

FIGURE II

Flyer Samples

Two examples of flyers for the 2008 fund-raising treatments (top row) and flyers for the 2008 survey treatments (bottom row). The top-left flyer is for the opt-out treatment, while the top-right flyer is for a flyer treatment. The bottom-row flyers are both for a 10-minute survey with flyer, the left one without payment, the right one for a $10 payment.

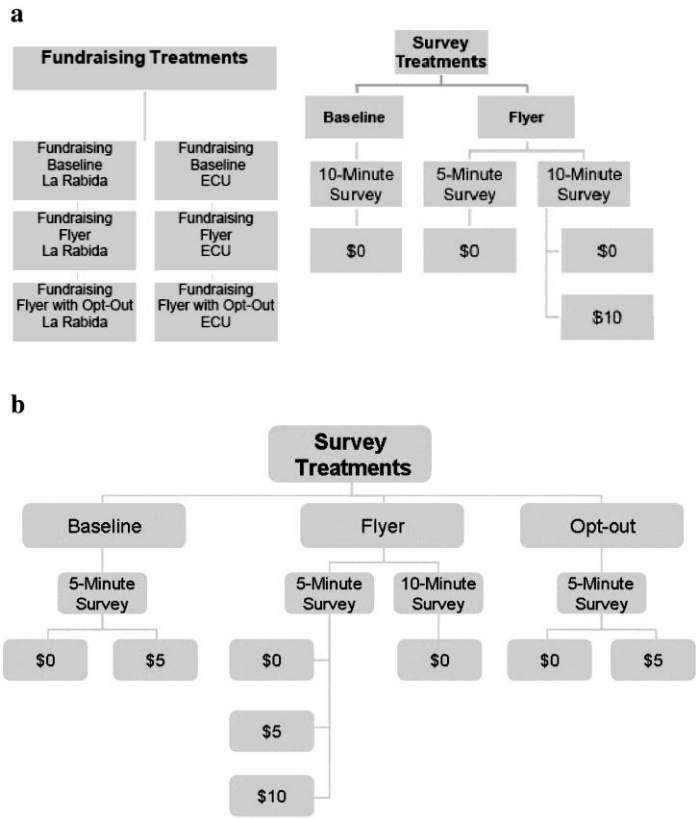

FIGURE III

Experimental Treatments (Top) 2008, (Bottom) 2009

Summary of the treatments run in the door-to-door field experiments in 2008 (charity and survey) and run in 2009. La Rabida and ECU are the names of the two charities for which the funds were raised.

flyer has a box "Check this box if you do not want to be disturbed." If the solicitors find the box checked, they do not knock on the door. The charity treatments are summarized in the top part of Figure III.

The survey treatments are aimed at estimating the elasticity of the presence at home and of the response rate to incentives. In Section V, we use these elasticities to estimate the social pressure

interval of visit. We therefore present the results combining these treatments. Excluding the observations with the two-week window does not change any of the results.

and altruism parameters. The survey questions are mostly about patterns of charitable giving in 2008 and about voter participation in 2009.[11] Figure III summarizes the survey treatments run in 2008 (top) and 2009 (bottom).

Sample and Randomization. We reached a total of 8,906 households in the charity treatments, 2,018 households in the 2008 survey treatments, and 10,594 households in the 2009 survey treatments. From this initial sample, we exclude 1,391 observations in which the households displayed a no-solicitor sign (in which case the solicitor did not contact the household) or the solicitor was not able to contact the household for other reasons (including, for example, a lack of access to the front door or a dog blocking the entrance). We also exclude 559 solicitor-day observations for 5 solicitors with substantial inconsistencies in the recorded data.[12] The final sample includes 7,668 households in the charity treatments, 1,865 households in the 2008 survey treatments, and 10,035 households in the 2009 survey treatments.

The charity field experiment took place in 2008 in three waves. In the first wave (April 27 to June 1), we solicited for both charities (with equal weights) and all three treatments (approximate weights of 40% for no-flyer, 35% flyer, 25% opt-out). In the second wave (July 13 to August 23), we solicited only for La Rabida and ran only no-flyer and flyer treatments (with equal weights). In the third wave (September 6 to October 18) we solicited for both charities (the ECU charity is over-sampled with weight 75%) and all treatments (approximate weights of 25% for no-flyer, 50% flyer, 25% opt-out). The script of the randomization and the flyer design is the same throughout. Within each of these waves, the randomization of the treatments takes place for each solicitor-hour and is at the street level within a town.

IV. Reduced-Form Estimates

We report the differences across the treatments in the share of households answering the door, the empirical counterpart of

11. In the 2009 survey treatments, about half of the flyers specify that the survey will be about voter participation. The results are similar for the two types of flyers and hence we pool them in the analysis.

12. These five solicitors indicate the presence of flyers on the door or on the floor also for households in the no-flyer treatment.

$P(H)$, and the share of households giving to the charity in person, corresponding to $P(G)$. We also present results on giving conditional on being at home, corresponding to $P(G|H)$, on the frequency of small and large donations, $P(G^{LO})$ and $P(G^{HI})$, and on giving via mail and Internet, $P(G_m)$.

Table I presents the summary statistics on the key treatment outcomes. The rate at which the respondents open the door varies between 41% and 42% in the baseline treatments for La Rabida, ECU, and in the 2008 survey treatment. Since households did not know the task at hand, these averages ought, indeed, to be close. The share answering the door is smaller for the flyer treatment and smaller yet for the opt-out treatment. The share of givers is substantially smaller for the ECU charity than for the La Rabida charity, consistent with our survey evidence that the La Rabida charity is more liked than the ECU charity. For ECU, the share of givers is substantially lower in the opt-out treatment than in the other treatments. For La Rabida, instead, giving is somewhat higher in the opt-out treatment. In the survey treatments, the share opening the door and the share completing the survey are generally larger for the treatments with higher pay and shorter duration both in 2008 and 2009.

While the summary statistics provide suggestive evidence on the impact of the treatments, the raw statistics are potentially confounded with randomization fixed effects. As discussed in Section III, treatments were randomized within a date-solicitor time block, but not all treatments were run in all time periods. Hence, estimates that do not control for the randomization fixed effects may be confounded, for example, by time effects—we ran more ECU treatments later in the sample when donation rates also happened to be lower. It turns out that all directional effects indicated in the summary statistics, except for the higher giving to La Rabida under opt-out, are confirmed once we add the randomization fixed effects.

The benchmark empirical specifications (Table II) control for solicitor i and day-town t fixed effects.[13] The identification comes from within-solicitor, within-day variation in treatment. The vector of control variables $X_{i,t,h}$ includes dummies for the hourly time blocks h (10 am, 11 am, 1 pm, 2 pm, 3 pm, and 4 pm), and dummies for a subjective rating by the solicitor of the quality

13. On almost all days, we visited only one town, so that the day-town fixed effects are essentially equivalent to day fixed effects.

TABLE I

SUMMARY STATISTICS

Panel A: Fund-raising treatments

Variable:	Share of households answering the door			Share of households giving In person			Number of households giving via mail or internet	
Sample:	Pooled (1)	ECU (2)	La Rabida (3)	Pooled (4)	ECU (5)	La Rabida (6)	ECU (7)	La Rabida (8)
Baseline (no-flyer) treatment	0.4090 (N = 3166)	0.4228 (N = 946)	0.4032 (N = 2220)	0.0629	0.0507	0.0680	Zero donations across all treatments	One ($25) donation across all treatments
Flyer treatment	0.3753 (N = 3432)	0.3993 (N = 1172)	0.3628 (N = 2260)	0.0585	0.0460	0.0650		
Flyer with opt-out treatment	0.3355 (N = 1070)	0.3503 (N = 588)	0.3174 (N = 482)	0.0514	0.0289	0.0788		
N	N = 7668	N = 2706	N = 4962	N = 7668	N = 2706	N = 4962	N = 2706	N = 4962

TABLE I
(CONTINUED)

Panel B: Survey treatments

Variable: *2008 survey treatments*	Share of households answering the door (1)	Share of households completing the survey (2)	*2009 survey treatments*	Share of hhs. answering the door (3)	Share of hhs. completing the survey (4)
Baseline ($0/10min) treatment	0.4135 (N = 607)	0.0972	Baseline ($0/5min)	0.3915 (N = 1420)	0.1472
Flyer ($0/10min) treatment	0.3681 (N = 489)	0.1186	Baseline ($5/5min)	0.3956 (N = 910)	0.1231
Flyer ($0/5min) treatment	0.392 (N = 449)	0.1714	Flyer ($0/10min)	0.3771 (N = 769)	0.1430
Flyer ($10/10min) treatment	0.4156 (N = 320)	0.1719	Flyer ($0/5min)	0.3852 (N = 1703)	0.1679
N	N = 1865	N = 1865	Flyer ($5/5min)	0.4057 (N = 1856)	0.2085
			Flyer ($10/5min)	0.4428 (N = 673)	0.2600
			Opt-out ($0/5min)	0.3420 (N = 1374)	0.1434
			Opt-out ($5/5min)	0.3639 (N = 1330)	0.1797
			N	N = 10035	N = 10035

Notes. Summary statistics for the variables of the experiment. "ECU" and "La Rabida" indicate the two charities in the experiment, "ECU" is an out-of-state research center on hurricanes, "La Rabida" is an in-state children's hospital.

TABLE II

RESULTS FOR FUND-RAISING TREATMENTS

Specification:	OLS regressions									
Dep. var.:	Indicator for answering the door		Indicator for giving		Indicator for giving: Small amount ($\leq$ \$10)		Indicator for giving: Large amount ($>$ \$10)		Amount given (including \$0)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Flyer treatment	−0.0387		−0.0011		−0.0033		0.0022		−0.1459	
	(0.0137)***		(0.0062)		(0.0052)		(0.0035)		(0.1357)	
Flyer with opt-out treatment	−0.0967		−0.0195		−0.0193		−0.0002		−0.3041	
	(0.0194)***		(0.0084)**		(0.0081)**		(0.0051)		(0.1653)*	
Indicator ECU charity	0.01	0.0041	−0.0249	−0.0263	−0.0127	−0.0107	−0.0123	−0.0155	−0.7611	−0.9767
	(0.0143)	(0.0234)	(0.0049)***	(0.0085)***	(0.0053)**	(0.0085)	(0.0032)***	(0.0052)***	(0.1368)***	(0.2014)***
Flyer treatment * ECU charity		−0.0365		0.0006		−0.0045		0.0051		0.1154
		(0.0313)		(0.0094)		(0.0076)		(0.0045)		(0.1240)
Flyer with opt-out * ECU charity		−0.089		−0.0183		−0.0222		0.0039		−0.0907
		(0.0271)***		(0.0100)*		(0.0098)**		(0.0058)		(0.1268)
Flyer treatment * La Rabida charity		−0.0396		−0.0019		−0.0028		0.0009		−0.2545
		(0.0144)***		(0.0078)		(0.0066)		(0.0046)		(0.1841)
Flyer with opt-out * La Rabida charity		−0.106		−0.0202		−0.0161		−0.0042		−0.4573
		(0.0319)***		(0.0132)		(0.0128)		(0.0087)		(0.2885)
Omitted treatment	No-flyer, La Rabida		No-flyer, La Rabida		No-flyer, La Rabida				No-flyer, La Rabida	
Mean of dep. var. for omitted treatment	0.413		0.0717		0.0414	0.0414	0.0215	0.0215	1.161	1.161
Fixed effects for solicitor, date-location, hour, and area rating	X	X	X	X	X	X	X	X	X	X
N	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668	N = 7668

Notes. Estimates for a linear probability model, with standard errors clustered by solicitor-date, in parentheses. The omitted treatment is the baseline no-flyer fund-raising treatment for the La Rabida charity. The regressions include fixed effects for the solicitor, for the date-town combination, for the hour of day, and for a subjective rating of home values in the block. * significant at 10%; ** significant at 5%; *** significant at 1%.

of the houses visited in that hour block on a 0–10 scale. The latter controls provide a rough measure of the wealth level of a street within a town. We run the OLS regression

$$y_{i,j,t,h} = \alpha + \Gamma T_{i,t,h} + \beta_{ECU} d_{ECU} + \eta_i + \lambda_t + BX_{i,t,h} + \varepsilon_{i,j,t,h}, \quad (2)$$

where the dependent variable $y_{i,j,t,h}$ is, alternatively, an indicator for whether individual j opened the door (y^H), gave a positive amount to the charity (y^G), gave a small amount ($y^{G_{LO}}$), or gave a large amount ($y^{G_{HI}}$). The vector $T_{i,t,h}$ contains indicators for the various fund-raising treatments, with the baseline no-flyer treatment for La Rabida as the omitted group. As such, the point estimates for Γ are to be interpreted as the effect of a treatment compared to the baseline.[14] We cluster the standard errors at the solicitor × date level.

We also estimate the impact of the fund-raising treatment separately for the two types of charities (ECU and La Rabida), using the following OLS regression model:

$$y_{i,j,t,h} = \alpha + \Gamma_{LaR} T_{i,t,h} d_{LaR} + \beta_{ECU} d_{ECU} + \Gamma_{ECU} T_{i,t,h} d_{ECU} + \eta_i + \lambda_t + BX_{i,t,h} + \varepsilon_{i,j,t,h}, \quad (3)$$

where d_{ch} is an indicator variable for charity $ch \in \{LaR, ECU\}$. The omitted treatment is the no-flyer treatment for La Rabida. In Figures IVA and IVB, we plot the estimated coefficients from this specification. The estimated impact for the baseline no-flyer treatment for La Rabida is $\hat{\alpha}$, from specification (3) with no fixed effects and controls. The estimated impact for the other treatments k are $\hat{\alpha} + \hat{\gamma}^k_{LaR}$ for La Rabida and $\hat{\alpha} + \hat{\beta} + \hat{\gamma}^k_{ECU}$ for ECU.

Answering the Door. For both charities, a flyer announcing the visit reduces the share of households opening the door by about 4 percentage points relative to the baseline treatment with no flyer (Figure IVA). As Table II shows, the difference is statistically significant at conventional levels. The share of households opening the door is further lowered, by an additional 5 to 6

14. The specification assumes that the impact of the fixed effects on the relevant outcomes is additive. We obtain essentially identical results using solicitor-time-date fixed effects, reported in the Online Appendix. These fixed effects, however, do not allow us to identify the difference in outcomes between La Rabida and ECU, because on any given date each solicitor raised money for only one charity.

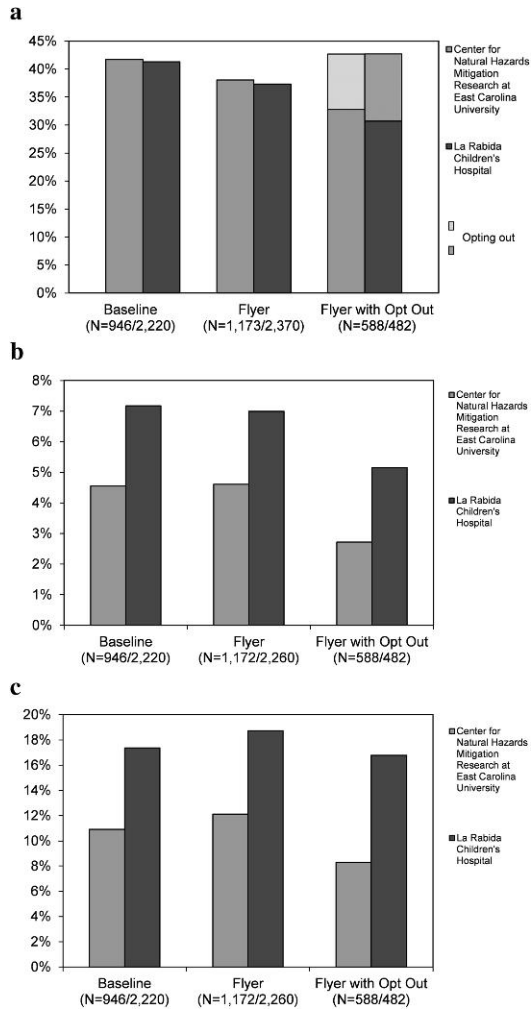

FIGURE IV

Frequency of (A) Answering the Door, (B) (Unconditional) Giving, and (C) Giving Conditional on Answering the Door

Panel A presents the percent of households that answer the door under different treatment. The third set of bars (opt-out treatment) also shows the percent opting out (shaded colors on top). Panel B displays the percent that give to the charity out of all the households in the treatment group (including those not answering the door). Panel C shows giving conditioned on answering the door, which equals the ratio of the estimated shares of unconditional giving (Figure IVB) and of households answering the door (Figure IVA). All estimates are obtained from regressions that control for randomization fixed effects.

percentage points, by the presence of an opt-out condition (*Check this box if you do not want to be disturbed*) on the flyer. Hence, the flyer and the opt-out conditions lower the probability of opening the door by, respectively, 10% and 25%, an economically large effect that is similar for both charities. We interpret this evidence as suggestive of social pressure: when informed of a visit by a solicitor, households attempt to avoid the interaction, especially when doing so has little cost, as in the opt-out treatment. Notice that the reduction in the probability of opening the door in the presence of a flyer can be due to two factors: a lower probability of being at home, or a lower probability of opening the door conditional on being at home. The variable we measure captures the sum of these two effects.

Opting Out. Figure IVA also presents evidence on the share of subjects in the opt-out treatment that check the opt-out box: 12% of all households for the La Rabida charity and 9.9% for the ECU charity. Households that, in the flyer treatment, are explicitly avoiding the solicitor by not answering the door, instead use the opt-out option when available. This result is consistent with the assumption that checking the opt-out box is a cheaper way to avoid a solicitor.

Unconditional Giving. Figure IVB presents the results on the unconditional giving probability, including households that do not answer the door. Not surprisingly, giving is higher for the preferred charity, La Rabida, than for ECU in each treatment. The pattern of effects across treatments is similar for the two charities. The baseline and the flyer treatments have essentially the same share of giving. The lack of a difference between these treatments is estimated quite precisely because we overweighted the baseline and flyer treatments. The opt-out treatment, instead, lowers giving by 2 percentage points for both charities. This difference is statistically and economically significant (see Table II): the effect amounts to a reduction in giving of about a third relative to the other treatments.

The first result—that the flyer per se does not affect giving—is consistent with both social pressure and altruism affecting charitable giving. The advance notice increases the presence at home of the altruistic givers and lowers the presence of those who give due to social pressure. To the extent that these two forces are of about the same size, we expect no overall impact. Note that

this result does not contradict our previous finding that the flyer significantly reduces the share of households opening the door. In the presence of social pressure costs, nongivers also avoid being at home when notified with a flyer. This avoidance does not impact the probability of giving, but it lowers home presence.

The second result—that the opt-out option significantly lowers giving—points to the importance of social pressure: in the opt-out treatment the cost of avoiding the fund-raiser is substantially lowered, and giving decreases proportionally. If giving was primarily due to altruism, the opt-out option should not affect giving rates or levels.

Conditional Giving. For both charities, the share of households that give among those who answer the door[15] is higher in the treatments with flyer than in the baseline treatment (Figure IVC). This increase is consistent with Proposition 3 since the flyer allows sorting in by donors who want to give and sorting out by those who do not want to give. In the opt-out treatment, however, conditional giving is lower. This effect is inconsistent with Proposition 3, though not statistically significant at conventional significance levels.

Amount of Giving. In our model, individuals who give due to social pressure give at most g^S, whereas individuals who give due to altruism may contribute higher amounts. Hence, relative to the control treatment, the flyer treatment may both decrease smaller donations (sorting out of social-pressure givers) and increase larger donations (sorting in of altruists). The opt-out treatment, which further facilitates sorting out but not sorting in, should lower the share of small donations but not the share of larger donations (Proposition 4).

To test these predictions, we split donations based on the median amount given, \$10, and label donations smaller than (or equal to) \$10 as small and donations larger than \$10 as large. Figure V presents the results. In the baseline treatment, 4% of households give small donations, and 2% give large donations. The percentage giving a small donation decreases slightly in the flyer treatment and decreases by 2.1 percentage points in the opt-out treatment. Hence, the opt-out option more than halves the

15. The conditional giving for each treatment is the estimated unconditional giving, Figure IVB, divided by the estimated share of households answering the door, Figure IVA.

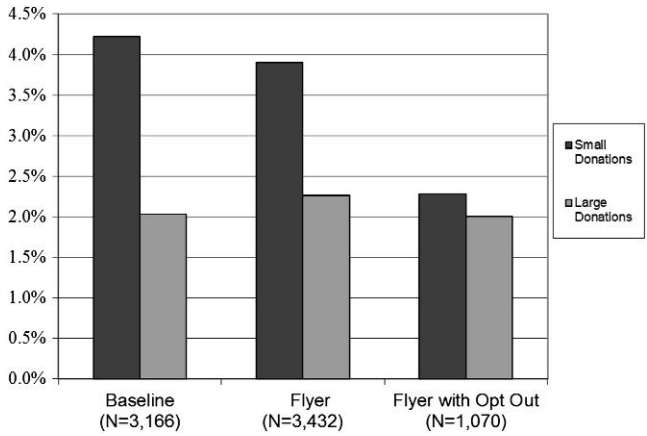

FIGURE V

Frequency of Giving: Small versus Large (*Pooled*)

Figure presents the results on (unconditional) giving of small ($\leq$\$10) and large ($>$\$10) donations across treatment. The estimates are obtained from regressions that control for randomization fixed effects.

likelihood of a small donation, a significant difference as shown in Table II. The pattern is very different for large donations. The flyer somewhat increases the incidence of larger donations, though not significantly, and the opt-out option has no effect. This pattern is consistent with Proposition 4.

Figure VI presents additional information on the distribution of the amount given across treatments. The opt-out treatment, compared to the baseline treatment, induces a decrease in the donations up to \$10, but no change in larger donations. The histogram also provides evidence of bunching at \$5 and \$10. In the structural model, we use this information and consider \$10 as the amount that eliminates all social pressure from not giving, g_s.

Finally, in columns (9) and (10) of Table II we consider the effect of the different treatments on the amount given. There is no significant effect of the flyer treatment, and a marginally significant reduction in giving with the opt-out treatment.

Robustness. We examine the robustness of specification (2) in Table II to: (i) omitting the dummy for the ECU charity; and (ii) introducing fixed effects for solicitor-day-location fixed effects,

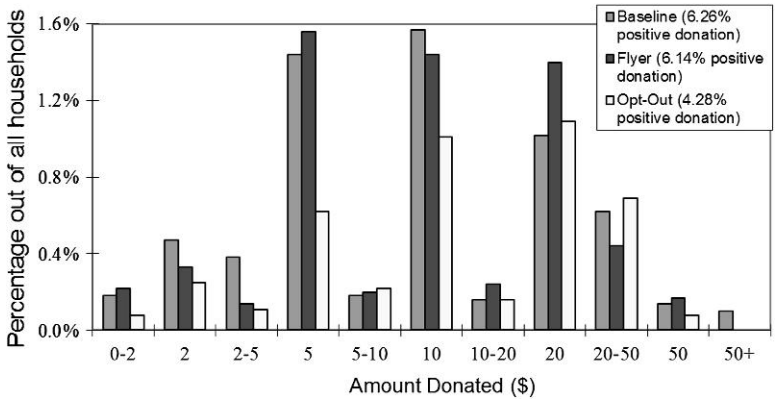

FIGURE VI

Distribution of Amounts Donated

Figure displays the distribution of donation amounts across different treatment groups. Each bar indicates the percentage giving the specified amount out of all households in the treatment. The figure does not display the share of households donating $0. The estimates are obtained from regressions that control for randomization fixed effects.

which allows for different solicitor fixed effects on different days or towns. Online Appendix Table 1 shows that the estimates are essentially identical.

In Online Appendix Table II, we estimate separately the results for the three experimental waves in 2008: April to June (wave 1), July and August (wave 2), September and October (wave 3). The results in the first and second waves for the flyer treatment are consistent (in wave 2 we did not run an opt-out treatment): in both waves the share answering the door significantly decreases in response to a flyer, and there is no effect on the share giving. In the third wave, we obtain similar effects as in the previous waves for the share answering the door, but somewhat different effects on giving. In this time period, which coincides with the peak of the financial crisis, the level of giving is substantially lower. Given this lower level, a flyer (marginally) increases giving, mostly in the form of larger donations; a flyer with opt-out option still lowers giving, though less so than in previous waves. These results are consistent with the crisis reducing giving due to lower social pressure cost of turning away a solicitor ("sorry, times are tough"), but the sample size in this period is too small to draw firm conclusions.

Giving via Mail or Internet. We also obtained data on mail and Internet donations from the households in our sample over the time period of the fund-raising campaign. The results are reported in columns (7) and (8) of Table I. There was not a single donation to ECU, and only one donation to La Rabida—a striking difference compared to the 3–7% of households donating in person for the same charities. The near absence of donations provides further evidence on the motivations of giving. If giving was due to pure altruism, individuals who see the flyer but cannot be at home during the fund-raiser would donate via mail or Internet. The cost of this form of giving (captured by θ in our model) attenuates giving, but not likely to be zero. A model of warm glow can better fit the data if we assume that the warm glow arises only from in-person donations (i.e., θ is close to 0). The lack of mail or Internet donations is also consistent with social pressure: giving arises only under high social pressure.

Survey. For the survey treatments, we estimate a specification parallel to equation (2), separately for the 2008 and the 2009 field experiments. In the 2008 experiments (Figure VII (top) and column (1) of Table III), a flyer announcing a \$0 10-minute survey reduces the share opening the door by 15% (though not significantly), compared to the same survey without flyer. In addition, flyers for more attractive surveys with either shorter duration (5 minutes) or higher payment (\$10) lead to a 10–15% increase in the share of households opening the door, indicating that households sort into shorter and better-paid surveys, though the difference is again not significant.

The share completing the survey is comparable (about 10%) for the \$0 10-minute conditions with and without flyer (Figure VII (top) and column (2) of Table III). Interestingly, the willingness to complete an unpaid 10-minute survey is higher than the willingness to give money even to an in-state charity. Also, compared to the \$0 10-minute survey with flyer, surveys with shorter duration or payment have a higher completion rate of 17–18%, a 70–80% increase. The increase is very similar for the two groups, indicating a high value of time for survey completion, consonant with the sample population characteristics.

Figure VII (bottom) and columns (3) and (4) of Table III report the results for the 2009 survey. Within the treatments with flyer, the share answering the door is increasing in the amount paid (from \$0 to \$5 to \$10). In addition, the share answering is

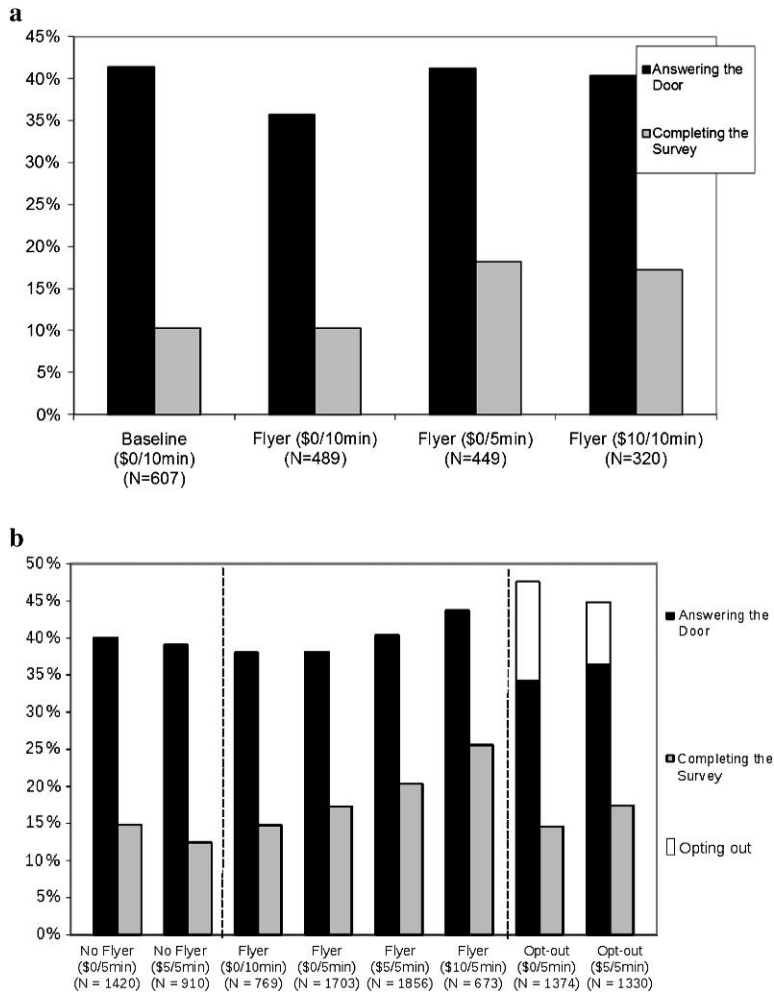

FIGURE VII

Surveys: (Top) 2008 Experiment, (Bottom) 2009 Experiment

Figures present the percent of households answering the door and the percent completing the survey (out of all households) in the survey treatment run in 2008 (top) and 2009 (bottom). The estimates are obtained from regressions that control for randomization fixed effects.

significantly lower for the treatments with opt-out, especially the treatment with no payment. These findings are consistent with the findings for 2008 and confirm a sizable responsiveness of the presence at home to the attractiveness of the task.

TABLE III
RESULTS FOR SURVEY TREATMENTS

Specification:	OLS regressions			
Sample:	2008 Survey		2009 Survey	
Dependent variable:	Indicator for answering the door (1)	Indicator for completing survey (2)	Indicator for answering the door (3)	Indicator for completing survey (4)
Flyer ($0/10min) treatment	−0.0563	0.0000		
	(0.0377)	(0.0260)		
Flyer ($0/5min) treatment	−0.0021	0.0794		
	(0.0334)	(0.0233)***		
Flyer ($10/10min) treatment	−0.0105	0.0695		
	(0.0448)	(0.0265)**		
Baseline ($5/5min) treatment			−0.0096	−0.0240
			(0.0217)	(0.0176)
Flyer ($0/10min) treatment			−0.0198	−0.0008
			(0.0247)	(0.0180)
Flyer ($0/5min) treatment			−0.0193	0.0243
			(0.0189)	(0.0132)*
Flyer ($5/5min) treatment			0.0028	0.0549
			(0.0205)	(0.0164)***
Flyer ($10/5min) treatment			0.0368	0.1072
			(0.0243)	(0.0187)***

TABLE III
(CONTINUED)

Specification:	OLS regressions			
Sample:	2008 Survey		2009 Survey	
Dependent variable:	Indicator for answering the door (1)	Indicator for completing survey (2)	Indicator for answering the door (3)	Indicator for completing survey (4)
Opt-out ($0/5min) treatment			−0.0583	−0.0026
			(0.0227)**	(0.0160)
Opt-out ($5/5min) treatment			−0.0373	0.0259
			(0.0192)*	(0.0162)
Omitted treatment	Baseline ($0/10min)		Baseline ($0/5min)	
Mean of dep. var. for omitted treatment	0.4138	0.1025	0.3915	0.1498
Fixed effects for solicitor, date-location, hour, and area rating	X	X	X	X
N	N = 1865	N = 1865	N = 10035	N = 10035

Notes. Estimates for a linear probability model with standard errors, clustered by solicitor-date, in parentheses. The omitted treatment is the baseline no-flyer $0–10 minutes survey for columns (1) and (2) and the baseline no-flyer $0–5 minutes survey for columns (3) and (4). The regressions include fixed effects for the solicitor, for the date-town combination, for the hour of day, and for a subjective rating of home values in the block. * significant at 10%; ** significant at 5%; *** significant at 1%

The 2009 treatments also indicate a strong response of survey completion with respect to duration and payment. The survey completion rate in treatments with flyer increases monotonically from 14.8% for a \$0 10-minute survey to 25.5% for a \$10 5-minute survey. The latter completion rate is remarkably high: over 50% of the people opening the door took the survey. There is a similar increase in survey completion with respect to payment in the opt-out treatments, though not in the treatments without flyer.

V. Structural Estimates

The reduced-form estimates provide qualitative evidence on the importance of both altruism and social pressure, but they do not allow for a quantitative estimate of the underlying social preferences. We now estimate the model parameters structurally, combining the results of the fund-raising and the survey experiments.

Set-up. We estimate the model of Section II, imposing seven additional assumptions, several of which are relaxed below. First, the private utility of consumption is linear, $u(W-g)=W-g$. This assumption is not unduly restrictive since utility should be locally linear in a standard expected utility framework. Second, the altruism parameter a comes from a normal distribution with mean μ and variance σ^2 censored below at 0, with the remaining probability mass assigned to $a=0$. Third, the altruism function is $v(g_i)=\log(\Gamma+g_i)$; the parameter Γ governs the concavity of the altruism function for $a>0$: a large Γ implies that the marginal utility of giving, given by $\frac{a}{(\Gamma+g_i)}$, declines only slowly in the individual giving g_i, consistent with pure altruism—the individual cares about the overall donation and her individual giving is only a small part. A small Γ instead indicates that the marginal utility diminishes steeply with the individual giving, more consistent with warm glow. Fourth, the social pressure cost S is homogeneous. Fifth, the level of giving g^S from which on there is no social pressure cost is \$10, the median donation. Sixth, the cost of leaving home $c(h)$ is symmetric around h_0 and quadratic: $c(h)=\frac{(h-h_0)^2}{2\eta}$. Seventh, to capture the lack of giving by mail, we set $\theta=0$.

To model behavior in the survey treatments, we assume a baseline utility s of completing a 10-minute survey for no monetary payment, with $s\sim F^s$, a normal distribution with parameters μ^s and σ^s. Hence, we allow s to be negative for households

that dislike doing surveys without compensation. In addition, individuals receive utility from a payment m for completing the survey, and receive disutility from the time cost t of the survey, both of which are deterministic. Given the assumption above of (locally) linear utility, we add these terms to obtain the overall utility from completing a survey: $s + m - t$. The time cost t equals τv_s, where τ is the duration of the survey in fraction of hours, and v_s is the value of one hour of time (see below). We denote by S^s the social pressure cost of saying no to a survey request.

The agent undertakes the survey if $s + m - t$ is larger than $-S^s$. The threshold $\bar{s}^{m,t} = -S^s - (m - t)$ is the lowest level of s such that individuals will agree to complete the survey if asked. An increase in the social pressure S^s or in the pay m, or a decrease in the cost of time t will lower the threshold and hence increase the probability of survey completion. The decision problem of staying at home conditional on receiving a notice is

$$\max_{h\in[0,1]} h \max(s + m - t, -S^s) - \frac{(h - h_0)^2}{2\eta}.$$

Taking into account corner solutions for h^*, this leads to a solution for the probability of being at home: $h^* = \max[\min[h_0 + \eta \max(s + m - t, -S^s), 1], 0]$.

The vector of parameters ξ that we estimate are: (i) h_0^{2008} and h_0^{2009}—the probabilities of opening the door in the 2008 and 2009 no-flyer treatments; (ii) r—the probability of observing (and remembering) the flyer; (iii) η—the responsiveness of the probability of opening the door to the desirability of being at home; (iv) μ^s and σ^s—the mean and standard deviation of the distribution F^s of the utility of completing a 10-minute survey; (v) v^s—the value of one hour of time spent completing a survey; (vi) S^s—the social pressure associated with saying no to the survey request; (vii) μ_a^{ch} and σ_a^{ch} (where $ch = LaR, Ecu$)—the mean and standard deviation of the censored normal distribution F from which the altruism parameter a is drawn; (viii) Γ—the curvature of the altruism function, which is assumed to be the same for the two charities; (ix) S^{ch} ($ch = LaR, Ecu$)—the social pressure cost associated with a donation request; the tables display the social pressure cost associated with giving zero, $Sg^S = 10S$.

To estimate the model, we use a minimum-distance estimator. Denote by $m(\xi)$ the vector of moments predicted by the theory as a function of the parameters ξ, and by $\hat{m}$ the vector of observed

moments. The minimum-distance estimator chooses the parameters $\hat{\xi}$ that minimize the distance $(m(\xi) - \hat{m})' W (m(\xi) - \hat{m})$, where W is a weighting matrix. As a weighting matrix, we use the diagonal of the inverse of the variance-covariance matrix. Hence, the estimator minimizes the sum of squared distances, weighted by the inverse variance of each moment.[16] As a robustness check, we also use the identity matrix as weight. To calculate the theoretical moments, we use a numerical integration algorithm based on adaptive Simpson quadrature, implemented in Matlab as the *quad* routine.

As moments $m(\xi)$ we use the following probabilities (where $j = F, NF, OO$ and $ch = LaR, Ecu$): (i) the probability of opening the door in the various charity treatments ($P(H)_j^{ch}$); (ii) the probability of checking the opt-out box in the opt-out treatment ($P(OO)_{OO}^{ch}$); (iii) the unconditional probability of giving in the various charity treatments ($P(G)_j^{ch}$); (iv) the probability of giving an amount of money in different ranges ($P(0 < G < 10)_j^{ch}$, $P(G = g^s = 10)_j^{ch}$, $P(10 < G \leq 20)_j^{ch}$, $P(20 < G \leq 50)_j^{ch}$, and $P(G > 50)_j^{ch}$); (v) the probability of opening the door in the various survey treatments k (with varying dollar amounts, minutes, and flyer conditional), $P(H)_k^s$, run in 2008 and in 2009; (vi) the unconditional probability of completing the survey in the various survey treatments, $P(SV)_k^s$, run in 2008 and in 2009; and (vii) the probability of checking the opt-out box in the survey opt-out treatments ($P(OO)_k^s$). The corresponding empirical moments $\hat{m}$ are estimated in a first-stage model using the same controls as in the main regressions, and are listed in the Appendix.

To calculate the method of simulated moments estimate, we employ a common sequential quadratic programming algorithm (Powell 1983) implemented in Matlab as the *fmincon* routine. We impose the following constraints: $S^{ch}, S^s \geq 0$ (social pressure nonnegative), $\sigma^{ch}, \sigma^s > 0$ (positive standard deviation of altruism), $h_0^{2008}, h_0^{2009}, r \in [0,1]$ (probabilities between 0 and 1), and $\eta \in [0, 9999]$ (finite elasticity of home presence). We begin each run of the optimization routine by randomly choosing a starting point, drawn from a uniform distribution over the permitted parameter space. The algorithm determines successive search directions by solving a quadratic programming subproblem based on an

16. Given the large number of moments, weighting the estimates by the inverse of the full variance-covariance matrix is problematic computationally.

approximation of the Lagrangian of the optimization problem. To avoid selecting local minima, we choose the run with the minimum squared distance of 500 runs.[17]

Under standard conditions, the minimum-distance estimator using weighting matrix W achieves asymptotic normality, with estimated variance $\frac{(\hat{G}'W\hat{G})^{-1}(\hat{G}'W\hat{\Lambda}W\hat{G})(\hat{G}'W\hat{G})^{-1}}{N}$, where $\hat{G} \equiv N^{-1}\sum_{i=1}^{N}\nabla_{\xi}m_i(\hat{\xi})$ and $\hat{\Lambda} \equiv Var[m(\hat{\xi})]$ (Wooldridge 2002). We calculate $\nabla_{\xi}m(\hat{\xi})$ numerically in Matlab using an adaptive finite difference algorithm.

Identification. Though the parameters are estimated jointly, it is possible to address the main sources of identification of individual parameters. The baseline probabilities of answering the door, h_0^{2008} and h_0^{2009}, are identified by the observed probabilities of opening the door in treatments without flyer. The probability of observing and remembering the flyer, r, is identified by two moments in the opt-out treatment: the fraction of households checking the opt-out box (10–12%), which equals $rh_0F(a_0)$, and the fraction opening the door. The elasticity of opening the door η with respect to incentives is identified by the fraction opening the door in the survey treatments for different payments and survey durations. In addition, η is identified by the amounts given in the different charity treatments.

The survey parameters are identified using the survey moments. The survey completion rates for varying amounts of compensation identify the heterogeneity in the willingness to complete the survey, and hence σ^s. For example, the completion rate of a 10-minute survey increases by 7 percentage point with a \$10 increase in pay (Figure VII, top). This indicates that $\frac{7}{h_0} = 17\%$ of the population assigns negative value to doing a survey for no payment, but assigns positive value to completing a survey when receiving \$10. The survey completion rate also identifies the mean willingness to complete a 10-minute survey, μ^s. The value of time v^s is identified from the comparison between pay increases for the survey (from \$0 to \$5 to \$10) and duration decreases (from 10 to 5 minutes). Finally, the social pressure S^s is identified by the share of people answering the door in the survey treatments. To see this, consider a respondent who dislikes answering a survey and hence will say no and incur the social pressure cost S^s. In the flyer

17. For the results presented here, the best estimate is achieved in about 40% of all runs.

treatment, she will choose to be at home with probability $h_0 - \eta r S^s$ (barring corner solutions for h). Hence, knowing h_0, η, and r, it is possible to identify S^s.

Turning to the charity parameters, the information on the amounts given identify the standard deviation of altruism σ_a^{ch}, mean altruism μ_a^{ch}, and the curvature parameter Γ. This is clearest for donations of $g > g^S$, where social pressure plays no role. Without social pressure, an individual with altruism a will give exactly g dollars if the marginal utility of giving, $av'(g) = \frac{a}{(\Gamma+g)}$, equals the private marginal utility of consumption, 1, and hence $a = \Gamma + g$. Thus, in this example without social pressure, the mass of households with altruism higher than $\Gamma + g$, that is, $1 - F(g + \Gamma)$, has to equal the observed share of households that give at least g. This pins down the empirical distribution of a for a given Γ. Figure VIIIA illustrates the identification mechanism for the estimated value of $\hat{\Gamma} = 10.61$ and giving levels g of \$0 and of \$10. The identification of Γ depends on two sets of moments: the sorting in of givers of larger amounts, and the giving of smaller amount. The more concave the altruism function is (that is, smaller Γ), the more altruistic individuals sort in because of higher infra-marginal utility of giving, and the more frequent are small donations. Finally, the social pressure S^{ch} is identified from two main sources of variation: home presence in the flyer treatment (which, to a first approximation, equals $h_0 - \eta r S$) and the distribution of small giving (the higher the social pressure, the more likely is small giving and in particular bunching at g^S).

Estimates. Column (1) in Table IV reports the benchmark estimates of the parameters along with standard errors. The probability of being at home h_0 is precisely estimated to be 41.4% in 2008 and in 2009. The share r of households that have read (and remember) the flyer is precisely estimated at 34.1%. Although this estimate may appear low, many households may have just disregarded the flyer, or a household member may have seen it, but not informed the person opening the door. The elasticity of home presence η is estimated to be 0.040 (s.e. 0.011), implying that the cost of increasing the probability of being at home and answering the door by 10 percentage points is $\frac{0.1^2}{2\eta} = \$0.13$.

The average utility for survey completion is estimated to equal −\$26.89, implying that, on average, households dislike completing 10-minute surveys for no pay. There is, however, significant heterogeneity ($\hat{\sigma}^s = \$29.59$), implying that a sizable

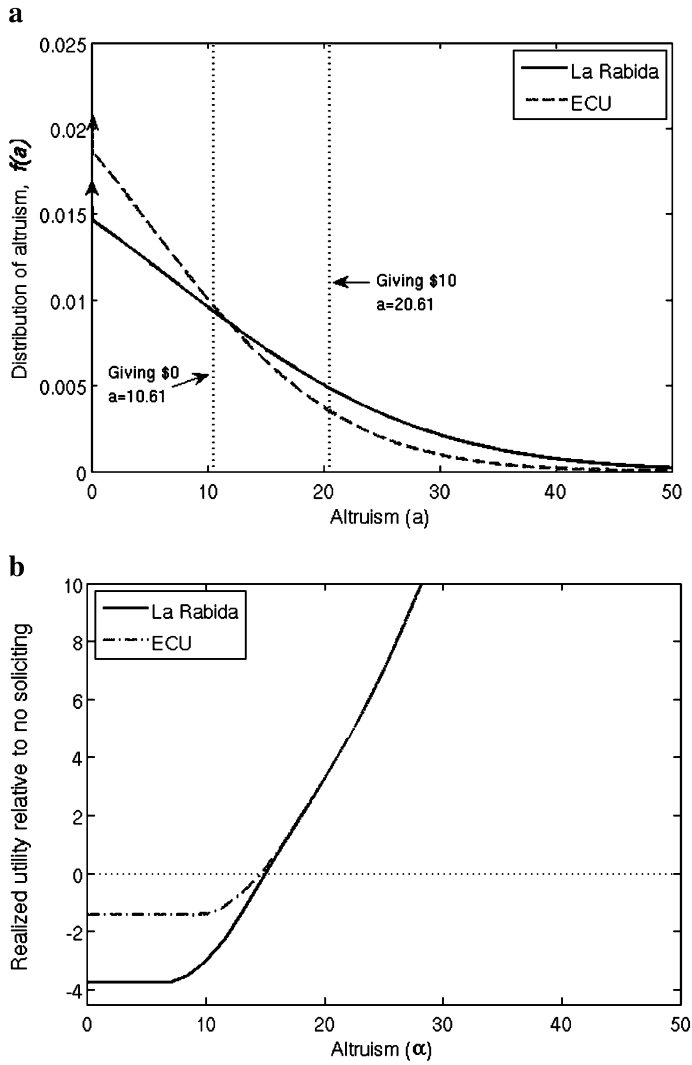

FIGURE VIII
(A) Distribution of Altruism and Cut-offs for Giving; (B) Overall Utility of Fund-Raiser as Function of Altrusim

Figure VIIIA plots the estimated distribution of the altruism parameter $a > 0$. The figure displays the threshold for giving \$0 and for giving \$10 in the absence of social pressure, given by $a\ v'(\Gamma + g) - 1 \succ 0$ or $\alpha \succ \Gamma + g$. Figure VIIIB plots the implied utility in equilibrium of a standard door-to-door fund-raiser, as a function of the altruism parameter a. The parameter values are from the benchmark minimum distance estimates (Table IV).

TABLE IV
MINIMUM-DISTANCE ESTIMATES: BENCHMARK RESULTS

Common parameters	Benchmark estimates (1)		No social pressure (2)	
Prob. of home presence (h) year 2008	0.414 (0.004)		0.383 (0.003)	
Prob. of home presence (h) year 2009	0.414 (0.007)		0.392 (0.008)	
Prob. of observing flyer (r)	0.341 (0.012)		0.426 (0.017)	
Elasticity of home presence (eta)	0.040 (0.011)		0.008 (0.003)	
Implied cost of altering prob. home by 10 pp.	0.126		0.656	
Survey parameters				
Mean utility (in $) of doing 10-minute survey	−26.863 (4.204)		−17.203 (3.466)	
Std. dev. of utility of doing survey	29.591 (5.129)		28.347 (5.374)	
Value of time of one-hour survey	80.656 (22.762)		83.039 (24.898)	
Social pressure cost if saying no to survey	6.197 (1.492)		0.000 (—)	
Charity parameters	La Rabida	ECU	La Rabida	ECU
Share with zero altruism a	0.753 (0.048)	0.763 (0.071)	0.723 (0.01)	0.747 (0.024)
Mean altruism a, conditional on $a>0$	12.786 (1.444)	9.659 (1.485)	14.167 (0.452)	10.272 (0.876)
Std. dev. of altruism a, conditional on $a>0$	10.545 (1.038)	7.994 (1.103)	11.569 (0.389)	8.455 (0.773)
Curvature of altruism function	10.606 (4.466)		10.606 (—)	
Social pressure cost of giving 0 in person	3.751 (0.581)	1.438 (0.784)	0 (—)	0 (—)
SSE	86.618		366.620	

Notes. Estimates from minimum-distance estimator with moments listed in the Appendix and weights given by inverse of diagonal of variance-covariance matrix. The estimation assumes a normal distribution censored below at 0, with the censored mass assigned to zero altruism (a=0). Notice that the share with zero altruism is not a separate parameter, but it is the share implied by the censoring of a at a=0. In column (2) we estimate the model fixing the social pressure parameters to 0; in addition, since the curvature of the altruism function is very poorly identifed, we fix it at the same value as in column (1). Standard errors are in parentheses. SSE reports the weighted sum of squared errors.

share of respondents like doing surveys even for no pay. The value of time for one hour of survey completion is estimated to be $80.66, which corresponds approximately to the value of time

for the households in the wealthy neighborhoods we reached.[18] Finally, the social pressure cost of turning down a survey request, S^s, is estimated to be \$6.20, a sizable magnitude.

Turning to the charity parameters, we estimate that about 75% of households have no altruism for either charity and that, conditional on a positive altruism, the mean altruism is higher for the La Rabida charity (12.79) than for the ECU charity (9.66). Figure VIIIA plots the implied distribution of the altruism parameter a for $a > 0$ for La Rabida and ECU. The estimated $\hat{\Gamma}$ is small, implying a highly concave altruism function, consistent with warm-glow rather than with pure altruism.

The social pressure parameters are quite precisely estimated, and the data reject the null hypothesis of no social pressure cost. Turning down a door-to-door giving request is associated with a social pressure cost of \$3.75 (s.e. \$0.58) for La Rabida and \$1.44 (s.e. \$0.78) for ECU. That is, it is psychologically more costly to say no to a well-liked local nonprofit than to a lesser-known out-of-state charity. The sizable social pressure cost suggests that the welfare implications of door-to-door campaigns can be large, as we explore below.

While the model with social pressure does a nice job of fitting the observed moments (Appendix), the same cannot be said of a model with no social pressure. In column (2) of Table IV we estimate the parameters forcing $S = 0$ (and setting Γ, which is essentially unidentified, to the value in column (1)). The fit is extremely poor, with the mean squared error 4.5 times larger. Missing social pressure, the model cannot explain opting out nor the decrease in the share answering the door in the flyer treatment.

In Table V we explore the robustness of the estimates to alternative model specifications with respect to the distribution of altruism, the cost function, and the heterogeneity of social pressure. We report the weighted sum of squared errors to allow for comparisons among the models. Allowing for negative values of altruism (spite) toward the charity with an untruncated normal distribution (column (2)) yields nearly identical estimates to the benchmark ones (column (1)).[19] Given that social pressure is estimated to be substantially lower than \$10, any level

18. At an average income of about \$100,000 per year, the implied hourly wage is \$50.

19. For $a < 0$, we assume $v(a) = \frac{e^{g_i}}{G}$.

TABLE V

MINIMUM DISTANCE ESTIMATES: ROBUSTNESS

Common parameters	Benchmark estimate (1)	Normal distr. of altruism, no mass at 0 (2)	Exponential distr. altruism, allows of mass at 0 (3)	Lognormal distr. of altruism, allows mass at 0 (4)	Benchmark asymmetric altruism, sorting cost (5)	Benchmark altr., allows for no social pref. (6)
Prob. observing flyer (r)	0.341	0.342	0.340	0.345	0.340	0.412
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.079)
Elasticity of home presence (eta)	0.040	0.040	0.034	0.047	0.340 down 0.055 up	0.033
	(0.011)	(0.011)	(0.008)	(0.013)	(0.011) (0.051)	(0.009)
Probability of type with no social preferences (p)						0.142
						(0.13)
Survey parameters						
Mean utility (in $) of doing 10-minute survey	−26.863	−26.924	−27.771	−26.163	−26.947	−23.049
	(4.204)	(4.227)	(4.332)	(4.072)	(4.152)	(5.072)
Std. dev. of utility of doing 10-minute survey	29.591	29.662	30.166	29.361	28.947	27.103
	(5.129)	(5.155)	(5.296)	(5.039)	(4.927)	(5.169)
Social pressure cost of saying no to survey	6.197	6.205	6.990	5.344	6.550	7.836
	(1.492)	(1.495)	(1.416)	(1.333)	(1.725)	(2.123)

TABLE V

(CONTINUED)

	Benchmark estimates (1)		Normal distr. of altruism, no mass at 0 (2)		Exponential distr. altruism, allows of mass at 0 (3)		Lognormal distr. of altruism, allows mass at 0 (4)		Benchmark altruism, asymmetric sorting cost (5)		Benchmark altr., allows for no social pref. (6)	
Charity parameters	La Rabida	ECU	La Rabida	ECU	La Rabida	ECU	La Rabida	ECU	La Rabida	ECU	La Rabida	ECU
Share with zero altruism	0.753	0.763	–	–	0.807	0.846	0.812	0.880	0.745	0.747	0.743	0.744
	(0.048)	(0.071)			(0.026)	(0.035)	(0.01)	(0.012)	(0.06)	(0.104)	(0.052)	(0.08)
Mean altruism a,	12.786	9.659	12.931	9.789	9.838	7.103	26.482	26.601	13.056	9.868	13.118	10.065
conditional on a>0	(1.444)	(1.485)	(1.503)	(1.551)	(0.541)	(0.929)	(1.314)	(1.11)	(1.935)	(1.777)	(1.689)	(1.718)
Std. dev. of altruism a,	10.545	7.994	10.647	8.080	9.838	7.103	10.710	6.913	10.741	8.122	10.631	8.163
conditional on a>0	(1.038)	(1.103)	(1.076)	(1.141)	0.541	0.929	(0.698)	(1.183)	(1.394)	(1.251)	(1.139)	(1.177)
Curvature of altruism	10.606		11.066		4.033		20.976		11.612		11.667	
function	(4.466)		(4.675)		(2.116)		(0.869)		(6.043)		(4.956)	
Social pressure cost	3.751	1.438	3.704	1.413	4.996	2.358	2.420	0.748	3.688	1.376	3.667	1.326
of giving 0 in person	(0.581)	(0.784)	(0.596)	(0.772)	(0.453)	(1.032)	(0.19)	(0.391)	(0.678)	(0.803)	(0.597)	(0.762)
SSE	86.618		86.623		90.715		86.653		86.520		86.233	
Welfare and decomposition of giving												
Average welfare per house.	−1.102	−0.442	−1.093	−0.435	−1.330	−0.708	−0.700	−0.213	−1.101	−0.426	−0.874	−0.323
of fund-raiser (in $)	(0.145)	(0.301)	(0.15)	(0.297)	(0.128)	(0.411)	(0.082)	(0.155)	(0.164)	(0.3)	(0.255)	(0.262)
Share of givers who seek	0.518	0.528	0.514	0.526	0.543	0.528	0.524	0.628	0.507	0.520	0.507	0.529
the fund-raiser	(0.041)	(0.095)	(0.041)	(0.095)	(0.056)	(0.097)	(0.053)	(0.105)	(0.05)	(0.098)	(0.04)	(0.096)

Notes. Estimates from minimum-distance estimator with moments listed in the Appendix and weights given by inverse of diagonal of variance-covariance matrix. Benchmark estimates in column (1) are from Table IV. Estimates in column (2) assume a (nontruncated) normal distribution for altruism a with no mass at a=0. Estimates in column (3) and (4) assume, respectively, an exponential distribution and a log-normal distribution for altruism a as well as a mass at a=0. Estimates in column (5) allow for a different elasticity *eta* of the cost function for increases and decreases in home presence. Estimates in column (6) allow for a share p of the population that have no altruism, nor social pressure. These agents do not give to charity and do not complete the survey. In column (6), the share with zero altruism includes the share with no social preferences. Standard errors are in parentheses. SSE reports the Weighted Sum of Squared Errors.

of altruism that is sufficiently small, or negative, is associated with identical behavior—turning down the charity and avoidance. Hence, the shape of the left tail of the altruism distribution is not identified and, importantly, does not affect the estimates of the other parameters. Next, we reestimate the model with alternative assumptions for the distributions of altruism: in column (3) we assume a negative exponential distribution of a (with mean $\frac{1}{\lambda}$) with additional probability mass z at 0; the results are very similar to the ones in the benchmark model. In column (4) we assume a log-normal distribution (with parameters μ and σ) and an added probability mass z at 0. The results are qualitatively similar, but with some quantitative differences, such as lower social pressure estimates.[20]

In column (5) we remove the assumption of a symmetric cost function and allow for the cost of avoidance to differ from the cost of sorting in:

$$c(h) = \begin{cases} \frac{(h-h_0)^2}{2\eta_+} & \text{for} \quad h \geq h_0 \\ \frac{(h-h_0)^2}{2\eta_-} & \text{for} \quad h < h_0. \end{cases}$$

The estimates of η_+ and η_- are close, even though η_+ is imprecisely estimated given that only the most favorable surveys ($10 payment for 5 minutes) increase on average the presence at home. As a result, the estimates of the other parameters hardly change.

In column (6) we remove the assumption of homogeneous social pressure and allow for a simple form of heterogeneity. We assume that a proportion p of households has no social preferences, that is, does not exhibit altruism ($a = 0$) and does not respond to social pressure ($S = 0$), and hence neither gives to charity nor completes surveys.[21] The remaining portion $1 - p$ is described by the benchmark model. The data provide some support for this type of heterogeneity, estimating a share $\hat{p}$ of 0.142 (s.e. 0.13). In turn, this raises somewhat the estimated share of households that observed the flyer $\hat{r}$ up to 0.41 and lowers the elasticity of the response $\hat{\eta}$. Despite these changes, the

20. The convergence properties for the lognormal distribution are not as good, presumably because of one additional parameter to be estimated in the distribution of altruism (μ, σ, and z), relative to the censored normal (μ and σ) and the exponential (λ and z) distribution.

21. We assume a deterministic value for doing the survey equal to the μ^S of the social-preference types. Given the estimated values, these types will not complete a 5-minute survey even for pay of $10.

social pressure parameters for the charity hardly move, while the estimated social pressure for survey completion increases. The added degree of freedom improves to a limited extent the fit of the model, in particular regarding the giving moments in the opt-out treatments.

We present further robustness checks for the benchmark distribution of altruism (censored normal, Online Appendix Table 3) and for the exponential distribution (Online Appendix Table 4). Using more detailed information on the quantity given (that is, the moments for giving $(0,3]$, $(3,7]$, $(7,10]$, $(10,20]$, $(20,50]$, 50+, column (2)) has a limited impact on the results. Using a rougher set of giving moments, that does not account for bunching at \$10, ($(0,10]$, $(10,20]$, $(20,50]$, 50+, column (3)) also produces similar point estimates, but larger standard errors, including on the social pressure parameters. Not surprisingly, the information contained in the exact amount given, and especially the bunching at \$10, helps provide identification. In columns (4) and (5) we use, respectively, only the charity moments and only the survey moments. The survey moments suffice to identify both the survey parameters and the common parameters. The charity moments identify the charity parameters, with estimates similar to the benchmark ones in column (1). This indicates that the survey moments are useful, but not necessary to identify η.[22] Importantly, the two sets of estimates—using the charity moments and using the survey moments—yield very similar values for the common parameters such as η and r, an important validation of the model. Finally, in column (6) we show that the estimates are not sensitive to using the identity matrix as weighting matrix.

Welfare. We evaluate the welfare associated with a standard no-flyer door-to-door drive. Figure VIIIB plots the utility for a household that opens the door (utility is 0 for the other households) as a function of the altruism a. The utility is negative for households with sufficiently low altruism a: these households refuse the solicitation and pay the cost $10S$. Households with positive but small altruism give small amounts, but still experience negative utility because they give more than they prefer

22. With coarser giving moments (as in column (3)), however, the charity moments cannot reliably identify η, indicating that the identification comes from the amount given for small magnitudes and the bunching at \$10.

and because they still incur some social pressure cost. For higher altruism, the utility of giving becomes positive.[23]

On net, a fund-raising campaign can either increase or decrease welfare of the solicitees, depending on which force dominates. Given the estimated distribution of altruism (Figure VIIIA), our fund-raiser lowers the utility for a large majority (the nondonors and the unhappy donors) while raising the welfare of only a small minority (the happy donors). Hence, the welfare effect is substantially negative once we average over all households contacted, including the ones not at home (whose welfare effect is 0): −$1.10 for La Rabida and smaller but still negative (−$0.44) for ECU (Panel A of Table VI).[24] The welfare effect is more negative for the more liked charity, because this charity induces higher social pressure to give. The finding of negative welfare effects is robust to all the different specifications (bottom row of Table V and Online Appendix Tables 3 and 4), and is smaller when allowing for types without social preferences. Our fund-raising drives are on average welfare-diminishing for the solicitees.

These welfare estimates do not account for the welfare of the recipient. For La Rabida, the estimated money raised per household contacted is $0.72, which amounts to $0.24 on net after taking into account a solicitor wage of $9.50 per hour (visiting 20 households per hour).[25] Hence, the money raised needs to be used very efficiently to generate positive societal welfare. For ECU, the net money raised is negative, implying a negative societal welfare effect.

The introduction of flyers changes the welfare implications. Flyers give the opportunity to sort and hence temper the negative welfare implications for the solicitees. Counterintuitively, flyers can also increase the amount of money raised. Even though sorting out is more frequent than sorting in, the households sorting in contribute substantially higher amounts. This generates, in our estimates, a small but positive effect on the amount given. After taking into account the added cost of hanging the flyers

23. For larger values of altruism, the utility level for La Rabida and ECU is the same, since the only difference between the two charities is the social pressure, and social pressure does not affect larger donations.

24. The effect exclusively on the households at home is larger by a factor of $\frac{1}{0.414}$.

25. Notice that these are the estimated amounts raised according to the model, and differ somewhat from the observed ones (Table II, column (9)).

TABLE VI

WELFARE AND DECOMPOSITION OF GIVING

Specification: Charity:	Minimum-distance La Rabida charity (1)	Benchmark estimates ECU charity (2)
Panel A. Welfare		
Welfare in standard (no-flyer) fund-raiser		
Welfare per household contacted (in $)	−1.102 (0.145)	−0.442 (0.301)
Money raised per household contacted	0.719 (0.035)	0.333 (0.046)
Money raised per household, net of salary	0.244 (0.035)	−0.142 (0.046)
Welfare in fund-raiser with flyer		
Welfare per household contacted (in $)	−0.952 (0.122)	−0.410 (0.288)
Money raised per household contacted	0.860 (0.044)	0.389 (0.057)
Money raised per household, net of salary	0.249 (0.044)	−0.221 (0.057)
Welfare in fund-raiser with opt-out		
Welfare per household contacted (in $)	−0.564 (0.077)	−0.234 (0.201)
Money raised per household contacted	0.808 (0.045)	0.370 (0.055)
Money raised per household, net of salary	0.292 (0.045)	−0.145 (0.055)
Panel B. Decomposition of giving in standard (no-flyer) fund-raiser		
Share of givers who would give	0.745	0.848
without social pressure ($S = 0$)	(0.056)	(0.079)
Share of amount that would be given	0.726	0.816
without social pressure ($S = 0$)	(0.03)	(0.093)
Share of givers who seek	0.518	0.528
the fund-raiser (happy givers)	(0.041)	(0.095)
Panel C. Sorting in fund-raiser with flyer		
Increase in answering the door due to	0.007	0.003
altruism (sorting in)	(0.001)	(0.001)
Decrease in answering the door due to	−0.045	−0.018
social pressure (sorting out)	(0.01)	(0.01)

Note. Welfare, decomposition, and sorting are computed using estimates from minimum-distance estimator with weights given by inverse of diagonal of variance-covariance matrix (column (1) in Table IV). The amount of money raised refers to the predicted amount given the estimated parameters. To compute the salary cost of the solicitor we assume an hourly wage of $9.5 and 20 households reached in one hour of fund-raising (25 in the opt-out treatment). We also assume that a solicitor flyers 70 households in one hour.

(70 households per hour), the net amount raised is about the same as in the baseline treatment in our estimates. A flyer with opt-out is even more beneficial for the welfare of the households visited, since the opt-out option eliminates the cost of sorting out (conditional on seeing the flyer), and still makes it possible to sort in. In addition, the opt-out option can increase net fund-raising because it increases the number of households the solicitor can approach per hour. Hence, providing information about an upcoming fund-raiser and allowing solicitees to sort out can be a win-win solution for both the charity and the households visited.

Decomposition of Giving and Sorting. We decompose the observed giving into giving due to altruism and giving due to social pressure, an exercise that is not possible using only the reduced-form results. For the no-flyer treatment, which is representative of a standard door-to-door campaign, we compute the counterfactual giving with social pressure set to 0, holding the other parameters at their benchmark estimates (Panel B of Table VI). Interestingly, 74.5% of the La Rabida donors and 84.8% of the ECU donors would give even without social pressure. These measures, however, neglect a second effect of social pressure: a respondent who would happily give, say, $2 in the absence of social pressure may feel compelled by social pressure to instead give $5. To avoid this, she may sort out.

Taking into account these distortions, the share of *givers* who assign positive overall utility to the fund-raiser is 51.8% for La Rabida and 52.8% for ECU. This result—that about half of the observed donors are not happy givers—is very robust (bottom rows in Table V and Online Appendix Tables 3 and 4).

Next, we use the model to estimate the amount of sorting into, and out of, answering the door in the flyer treatment (Panel B of Table VI). Notice that the reduced-form estimates only identify the sum of the two forces. Sorting in due to altruism is limited, contributing on average to an increase in the probability of answering the door of only 0.7% for La Rabida and 0.3% for ECU. Sorting out, instead, is substantial, equal to 4.5% for La Rabida and 1.8% for ECU. (There is less sorting out for the less-liked charity because the estimated social pressure cost is lower).

VI. Alternative Interpretations

We discuss four alternative interpretations of our empirical results.

Signaling of Quality of the Charity. Door-hangers are unusual in fund-raising campaigns. It is possible that they were taken as a signal of the quality of the charity, even though we made sure that they did not convey any different information than presented in person. To explain our results, the door-hangers with a Do-Not-Disturb box must have sent a more negative signal than the standard door-hangers. Perhaps, the opt-out box signaled that it was acceptable to avoid the fund-raiser. This explanation, however, does not obviously explain why the opt-out box is associated

with a reduction in small donations, but not of large donations. A change in perceived quality would presumably affect the whole distribution of giving.

Self- and Other-Signaling. Our model of social pressure assumes that individuals incur disutility when being ungenerous in person, but not when avoiding a solicitor. A related explanation is that individuals give to (costly) signal to themselves or to others (the solicitor) that they are generous types (Bodner and Prelec 2003; Benabou and Tirole 2006; Grossman 2010). To the extent that avoiding a fund-raiser does not send the same negative signal as an outright no, this explanation is very similar to the one we propose. However, this explanation does not explain as easily why so many households made use of the opt-out box, which is a clear signal to the solicitor, as well as possibly to the neighbors.

Dislike of Interaction with the Solicitor. A fund-raising visit may lower the welfare of the solicitees even in the absence of social pressure. Consider individuals who are altruistic toward a charity but dislike interacting with solicitors, perhaps because of the time involved. In a standard fund-raising campaign, these individuals, faced with a surprise home visit, give to the solicitor. In a campaign with a flyer, though, the individuals may avoid the solicitor, or check the opt-out box, if the disutility from the personal interaction is larger than the utility from giving. Hence, this interpretation can explain the observed patterns of door opening and giving. It even predicts that the opt-out effect is concentrated among small giving, since a distaste for interaction is more likely to outweigh the utility from giving a small amount. This explanation shares several features with social pressure, including the negative welfare implications of door-to-door campaigns. A key difference, however, separates the two explanations: An altruistic donor who dislikes solicitors, when alerted of a campaign by a flyer, should seek alternative ways to give that do not involve personal interaction, such as via mail or Internet. Instead, we observe no such substitution, as predicted by social pressure.

Time Inconsistency. Our estimates use the sorting decision to answer the door to estimate the preferences for giving. If the agent is time-inconsistent—for example, likes giving when in a warm state (e.g., when in a person-to-person interaction), but not in a

cold state (e.g., when reading a flyer)— we estimate the utility of the ex ante self reading the flyer.

VII. Conclusion

Are donations welfare-enhancing for the giver? We develop a theoretical framework and an empirical design to measure two reasons for giving: altruism and social pressure. As an illustration of our methodology, we present a field experiment that involves solicitors approaching thousands of households. We vary the extent to which the households are informed of the fund-raising drive ex ante and also conduct a complementary survey that varies cash payments. This design allows us to structurally estimate the parameters of interest.

We find evidence that both altruism and social pressure affect door-to-door charitable giving. We estimate that about half of donors would prefer not to be contacted by the fund-raiser either because they would prefer not to donate, or because they would prefer to donate less. We estimate a social pressure cost of turning down a giving request of $1 to $4, depending on the type of charity. As a result, the estimated average welfare effect of the door-to-door campaigns in our sample is negative.

If we take our fund-raising campaigns to be representative of door-to-door solicitation, our results indicate that unsolicited campaigns may lead to utility losses equivalent to hundreds of millions of dollars for the givers.[26] These results have implications for the optimal taxation regime of charitable giving, as they suggest that high-social-pressure solicitations may be welfare-decreasing for the giver. Although this could be used as an argument to introduce a do-not-solicit or do-not-call list for charities, our findings suggest a simple alternative: to provide an opportunity to the households to sort or, even better, to opt out.

In this article we focus on only one form of giving—door-to-door fund-raising—to showcase our approach. We conjecture that our results are likely to extend to other high-pressure approaches to raise money, such as phone-athons, charity banquets, auctions, lotteries, and so on, but likely have less explanatory power with lower-pressure approaches, such as mail solicitations.

26. The campaigns may still improve welfare overall if the charities spend the money very effectively.

In addition to presenting novel empirical findings, this article also distinguishes itself because of its methodological contribution of linking tightly a behavioral model with a field experiment designed to test its predictions. We first developed the theoretical model, which then informed the nature of the experimental treatments, and the experiments in turn informed the parameters of the model. Most of the extant literature, instead, overlays the structural model on experimental data already gathered. Our approach enables parameter estimates and welfare evaluations that complement the reduced-form evidence. We hope that future research builds on this strategy to provide more evidence on behavioral phenomena.

VIII. Mathematical Appendix

We define the three thresholds $\bar{a} \equiv \frac{u'(W-g^s)}{v'(g^s,G_{-i})}$,

$$\underline{a}(S) \equiv \begin{cases} \frac{u'(W-g^s)-S}{v^{+\prime}(g^s,G_{-i})} & \text{if } u'(W-g^s) \geq S \\ \frac{u'(W-g^s)-S}{v^{-\prime}(g^s,G_{-i})} & \text{if } u'(W-g^s) < S \end{cases},$$

$$\underline{\underline{a}}(S) \equiv \begin{cases} \frac{u'(W)-S}{v^{+\prime}(0,G_{-i})} & \text{if } u'(W) \geq S \\ \frac{u'(W)-S}{v^{-\prime}(0,G_{-i})} & \text{if } u'(W) < S \end{cases},$$

with $\bar{a} \geq \underline{a}(S) \geq \underline{\underline{a}}(S)$ for a given S and $\bar{a} = \underline{a}(0)$. The threshold $\bar{a}$ is always positive, while $\underline{a}(S)$ and $\underline{\underline{a}}(S)$ can be negative for high S.

LEMMA 1A (Giving in Person) For any a,there is a unique optimal donation $g^*(a,S)$, conditional on being at home, which is weakly increasing in a and takes the form: (i) $g^*(a,S) = 0$ for $a \leq \underline{\underline{a}}(S)$; (ii) $0 < g^*(a,S) < g^s$ for $\underline{\underline{a}}(S) < a < \underline{a}(S)$; (iii) $g^*(a,S) = g^s$ for $\underline{a}(S) \leq a \leq \bar{a}$; (iv) $g^*(a,S) > g^s$ for $a > \bar{a}$.

Define $a_m \equiv u'(W)/\theta v^{+\prime}(0;G_{-i})$, with $a_m \geq \underline{\underline{a}}(S)$ for all S.

LEMMA 1B (Giving via Mail) For any a and provided $0 < \theta < 1$, *there is a unique optimal donation via mail* $g_m^*(a)$ *(conditional on not being at home), which is weakly increasing in* a *and takes the form: (i)* $g_m^*(a) = 0$ *for* $a \leq a_m$*; (ii)* $g_m^*(a) > 0$ *for* $a > a_m$*; (iii) for* $a \leq \underline{\underline{a}}(S)$, $g^*(a;S) = g_m^*(a) = 0$ *and for* $a > \underline{\underline{a}}(S)$, $g^*(a;S) > \theta g_m^*(a)$. *If* $\theta = 0$, $g_m^*(a) = 0$ *for all* a.

Lemma 2 characterizes the solution for h^* as a function of the parameters a and S.

LEMMA 2 (Presence at Home) *For any a, there is a unique optimal probability of being at home* $h^*(a,S)$ *that is weakly increasing in a. For* $S=0$, $h^*(a,0)=h_0$ *for* $a \leq \underline{\underline{a}}(0)$ *and* $h^*(a,0) > h_0$ *for* $a > \underline{\underline{a}}(0)$. *For* $S>0$, *there is a unique* $a_0(S) \in (\underline{\underline{a}}(S), \bar{a})$ *such that* $h^*(a,S) < h_0$ *for* $a < a_0(S)$, $h^*(a_0(S),S) = h_0$, *and* $h^*(a,S) > h_0$ *for* $a > a_0(S)$.

The next lemma refers to $a_0(S)$ from Lemma 2. We break ties by assuming that if the agent is indifferent between $h = h_0$ and $h=0$, she does not opt out, that is, $h = h_0$.

LEMMA 3 (Opting Out). If $S=0$, the agent never opts out. If $S>0$, the agent opts out for sufficiently low altruism, $a < a_0(S)$.

Probabilities of Presence at Home and of Giving. Lemmas 2 and 3 implies that the probabilities of presence at home are

$$P(H)_{NF} = h_0,$$
$$P(H)_F = (1-r)h_0 + r\int_{-\infty}^{\infty} h^*(a,S)dF,$$
$$P(H)_{OO} = (1-r)h_0 + r\int_{a_{OO}}^{\infty} h^*(a,S)dF,$$

where $a_{OO} = -\infty$ for $S=0$ and $a_{OO} = a_0(S)$ for $S>0$.
Lemma 1Aa implies that the probabilities of giving in person are

$$P(G)_{NF} = [1 - F(\underline{\underline{a}}(S))]h_0$$

$$P(G)_F = (1-r)[1 - F(\underline{\underline{a}}(S))]h_0 + r\int_{\underline{\underline{a}}(S)}^{\infty} h^*(a,S)dF$$

$$P(G)_{OO} = (1-r)[1 - F(\underline{\underline{a}}(S))]h_0 + r\int_{a_0(S)}^{\infty} h^*(a,S)dF.$$

APPENDIX
EMPIRICAL MOMENTS AND ESTIMATED MOMENTS

Specification:	Minimum-distance estimates			
Charity	La Rabida charity		ECU charity	
	Empirical moments	Estimated moments	Empirical moments	Estimated moments
Panel A: Fund-raising moments	(1)	(2)	(3)	(4)
P(Home) no flyer	0.4130	0.4137	0.4171	0.4137
P(Home) flyer	0.3733	0.3757	0.3806	0.3989
P(Home) opt-out	0.3070	0.2917	0.3281	0.2835
P(opt out) opt-out	0.1202	0.1295	0.0988	0.1336
P(Giving) no flyer	0.0717	0.0665	0.0455	0.0423
P(Giving) flyer	0.0699	0.0711	0.0461	0.0451
P(Giving) opt-out	0.0515	0.0629	0.0272	0.0389
P(0<Giving<10), no flyer	0.0245	0.0251	0.0303	0.0271
P(0<Giving<10), flyer	0.0233	0.0227	0.0268	0.0266
P(0<Giving<10), opt-out	0.0163	0.0166	0.0118	0.0204
P(Giving=10), no flyer	0.0216	0.0205	0.0051	0.0051
P(Giving=10), flyer	0.0200	0.0211	0.0041	0.0056
P(Giving=10), opt-out	0.0138	0.0189	0.0014	0.0056
P(10<Giving<=20), no flyer	0.0137	0.0135	0.0084	0.0081
P(10<Giving<=20), flyer	0.0186	0.0167	0.0125	0.0099
P(10<Giving<=20), opt-out	0.0083	0.0167	0.0136	0.0099
P(20<Giving<=50), no flyer	0.0103	0.0072	0.0020	0.0021
P(20<Giving<=50), flyer	0.0078	0.0106	0.0030	0.0030
P(20<Giving<=50), opt-out	0.0138	0.0106	0.0008	0.0030
P(Giving>50), no flyer	0.0016	0.0001	−0.0003	0.0000
P(Giving>50), flyer	0.0002	0.0001	−0.0002	0.0000
P(Giving>50), opt-out	−0.0006	0.0001	−0.0005	0.0000
N	$N = 4962$	$N = 4962$	$N = 2706$	$N = 2706$

APPENDIX
(CONTINUED)

	P(Home)		P(Do survey)		P(Opt-out)	
	Empirical moments	Estimated moments	Empirical moments	Estimated moments	Empirical moments	Estimated moments
Panel B: Survey moments	(1)	(2)	(3)	(4)	(5)	(6)
Moments 2008						
No flyer $0, 10min	0.4138	0.4137	0.1025	0.1003	—	—
Flyer $0, 10min	0.3576	0.3725	0.1025	0.1230	—	—
Flyer $0, 5min	0.4118	0.3891	0.1819	0.1646	—	—
Flyer $10, 10min	0.4033	0.3984	0.1720	0.1873	—	—
N	N = 1865	N = 1865	N = 1865	N = 1865	—	—
Moments 2009						
No flyer $0, 5min	0.4009	0.4135	0.1486	0.1318	—	—
No flyer $5, 5min	0.3913	0.4135	0.1246	0.1576	—	—
Flyer $0, 10min	0.3812	0.3723	0.1478	0.1229	—	—
Flyer $0, 5min	0.3816	0.3889	0.1729	0.1646	—	—
Flyer $5, 5min	0.4038	0.4033	0.2035	0.1996	—	—
Flyer $10, 5min	0.4377	0.4193	0.2558	0.2373	—	—
Opt-out $0, 5min	0.3427	0.3432	0.1460	0.1576	0.1336	0.1061
Opt-out $5, 5min	0.3637	0.3605	0.1745	0.1920	0.0846	0.0982
N	N = 10035	N = 10035	N = 10035	N = 10035	N = 2704	N = 2704

Notes. The table presents the empirical moments and the estimated moments from a minimum-distance estimator. The empirical moments are obtained as regression estimates after controlling for the randomization fixed effects and as such can occasionally be negative. The minimum-distance estimates are in Table IV, column (1).

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SUPPLEMENTARY MATERIAL

An Online Appendix for this article can be found at QJE online (qje.oxfordjournals.org).

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