Give More Tomorrow: A Field Experiment on Intertemporal Choice in Charitable Giving*

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Abstract

This paper conducts a field experiment to explore inter-temporal choice in charitable giving. I design and test a fundraising strategy that allows for time-inconsistent preferences among donors. The strategy, Give More Tomorrow, consists of asking existing monthly donors to commit to an increase in their contributions, starting from a period in the future. In a control group, monthly donors are asked to increase their donations starting immediately. On average, the increase in donations is 32 percent higher in the treatment group, a highly significant difference. Furthermore, the result holds in the long-run. After 12 months, 96.6% of donors are still contributing every month and cancellations rates are nearly identical in the two treatment groups. This suggests that charities can boost donations by taking into consideration time-inconsistent preferences among donors.

Key words: Field experiment, Intertemporal choice, Charitable giving

JEL classifications: C93, L31; D91

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1 Introduction

Intertemporal choices in which costs and rewards occur at different points in time are of central importance in many economic decisions. People commonly tend towards doing tasks with immediate rewards and delayed costs. Conversely, they procrastinate on tasks with immediate costs and delayed rewards. Retirement savings, credit card borrowing and gym attendance are examples where intertemporal trade-offs have been shown to influence behaviour.[1] This paper investigates intertemporal choice in the previously unexplored context of charitable giving.

How can intertemporal trade-offs influence charitable donations? To answer this it will be necessary to explore donor time-consistency. Time-consistent donors have a constant discount rate between all future time periods. Time-inconsistent donors with present-biased preferences[2] will have a relatively high discount rate over short time horizons and relatively low discount rate over long time horizons. If donors do have present-biased preferences, and the cost associated with contributing to a charity occurs at a different time to the benefit, then it will influence how much a donor contributes to charitable causes.

To explore intertemporal choice in charitable giving, this paper conducts a natural field experiment on monthly donors who give over an extended period of time. I design and test a fundraising strategy aimed at increasing donations by taking into consideration present-biased preferences. The strategy, Give More Tomorrow (GMT), consists of asking existing monthly donors to commit to an increase in their contributions, starting from a period in the future.[3] This is contrasted with

[1] See, e.g., Lowenstein and Thaler, 1989; Laibson, 1997; O'Donoghue and Rabin, 1999; Bernatzi and Thaler, 2004; DellaVigna and Malmendier, 2006.

[2] Throughout this paper, the terms hyperbolic and present-biased preferences will be used interchangeably to characterize donors who have a relatively high discount rate over short horizons and relatively low discount rate over long horizons. The term "quasi-hyperbolic" preferences will be used for the specific functional form used in the theoretical section. The term "quasi-hyperbolic" preferences is used by Laibson (1997), while O'Donoghue and Rabin (1999) use the term "present-biased", Krusell and Smith (2003) "quasi-geometric", and Weibull and Saez-Marti (2005) "quasi-exponential".

[3] There is no end date, but the donor is free to opt out at any time. The average monthly donor

a control group, Give More Now (GMN), in which monthly donors are asked to increase their donations immediately. The pre-commitment mechanism in the GMT treatment should help individuals with time-inconsistent preferences to overcome their bias for the present. Therefore, we expect donors to increase their monthly donations more in the Give More Tomorrow treatment as compared to the Give More Now group.

To understand the intuition behind the Give More Tomorrow strategy, I offer a simple framework, combining the warm-glow model of imperfect altruism (Andreoni, 1989, 1990) with a model of quasi-hyperbolic preferences (see, e.g., Laibson, 1997; O'Donoghue and Rabin, 1999). In the warm-glow model, donors derive utility from two sources; the public good to which they are contributing, and the warm-glow from the act of giving. The simplest framework in which quasi-hyperbolic discounting is relevant is a three period model. The warm-glow occurs in the first period when a donor commits to giving, while the public good is realized in the final, third period. We compare the donor's contribution in two cases; (1) when the donor is asked to make an immediate contribution, and (2) when the donor is asked to make a contribution in the following period. The model predicts that the difference in contributions between the GMT and the GMN treatments will be larger for donors with quasi-hyperbolic preferences as compared to donors with time-consistent preferences. Furthermore, this prediction holds, notwithstanding if donors are pure altruists, impure altruists or solely motivated by warm-glow.

The Give More Tomorrow plan was implemented as a randomized field experiment in collaboration with Diakonia, a large Swedish charity. Diakonia was chosen for two reasons. First, the projects financed by Diakonia support long-run sustainable development in poor countries.[4] Thus, donors contribute to a public good that

remains with this charity for seven years and drop-out rates tend to be very low. To drop out, the donor must call the charity or alternatively his/her bank and ask them to stop the monthly contributions. No written notification is required.

[4] Two projects presented to the monthly donors as examples of the activities they are financing are (1) Working for debt relief for poor countries, and (2) Farming education for poor individuals in Cambodia so as to make them self-reliant.

will have positive long-run consequences, but no immediate effect. Second, the fact that the recipients are in foreign countries means that donors' motivation to give should stem from altruism or warm-glow rather than from personal consumption or insurance motives.

The name "Give More Tomorrow" is a tribute to the seminal paper of Benartzi and Thaler (2004) "Save More Tomorrow". The authors design and implement the Save More Tomorrow (SMarT) plan, which offers employees to commit in advance to allocating a portion of their future salary increases toward retirement savings. The precommitment helps individuals with time-inconsistent preferences to overcome their self-control problem, while starting at the time of the next salary increase hinges upon the assumption of loss aversion. There are three main differences between the two papers. First, the benefits and costs associated with charitable contributions are different from those associated with retirement savings. Second, this paper is randomized controlled field experiment while the "Save More Tomorrow" treatment was not randomized. Third, while both loss aversion and hyperbolic preferences could drive the result in the SMarT scheme, this paper isolates the pre-commitment effect.

The Give More Tomorrow field experiment was carried out between October 18 and November 21, 2005 within one of the charity's regular fund-raising campaigns. The donors were randomly divided into two treatment groups, where 553 donors were reached in the first group and 581 in the second. A telemarketing company was contracted to make the calls according to a pre-written manuscript. Two manuscripts were produced that were identical in all respects but the timing of the increase in the donation. In the first group, Give More Now (GMN), donors were asked to increase their donations starting from the next planned payment (November 28). In the second group, Give More Tomorrow (GMT), donors were asked to increase their donation from January 28, 2006. The delay in the payment between the two treatment groups was thus two months.

The results show that mean increase in donations is 32 percent higher in the Give More Tomorrow group as compared to the Give More Now group, a highly significant difference. Conditional on making an increase in donations, mean donations are also significantly higher in the GMT group as compared to the GMN group, the difference being 19 percent. This result holds in several robustness tests, controlling for donor characteristics.

In order to investigate the long-term effects, data on donors' monthly contributions were gathered one year after the original study. The follow-up study aims to answer the following two questions: Do donors deviate from the increases in contributions that they committed to in the experiment? Are there any differences in cancellation rates between the two treatment groups? The answer to both questions is no. In October 2006, 96.6% of donors participating in the field experiment had chosen to continue their monthly contributions.[5] The cancellation rates in the two treatment groups are similar at 3.6% and 3.3% for the GMN and the GMT treatments, respectively.

The main contribution of this paper is to illustrate that intertemporal choices influence charitable giving. In a randomized field experiment, I show that a charity can boost donations by allowing donors to pre-commit to future increases in donations. This result is consistent with a model combing warm-glow giving with present-biased preferences.

The remainder of this paper is organized as follows. Section 2 reviews the related literature and section 3 presents the model. Section 4 describes the experimental design, while section 5 presents the results. Section 6 discusses the interpretation of the treatment effect and section 7 concludes.

2 Review of related literature

To my knowledge, there are no studies investigating intertemporal choice in the context of charitable giving. The study closest to the one in this paper is that by Thaler and Benartzi (2004). A related study is conducted by Ashraf et al. (2006) as a field experiment in the Philippines. The SEED (Save, Earn, Enjoy Deposits) scheme helps individuals increase their savings by offering an enforceable

[5] An additional 0.4% were deceased and their monthly contributions had therefore been cancelled.

commitment device in collaboration with a local bank. The commitment device is a bank account, which restricts access to the deposits until the individual holding the bank account had reached a targeted savings goal. Both the SMarT and the SEED program have a lasting impact on the participants' savings.[6]

Another related strand of literature is the growing number of studies using randomized field experiments to examine various aspects of charitable giving. This paper employs the same methodology. The experiment is carried out in collaboration with a real charitable organization and donors are randomly allocated into different treatment groups.List and Lucking-Reiley (2002) investigate the effects of seed money[7] on charitable giving, while Falk (2004) studies charitable giving as a gift exchange. Landry et al. (2005) approach nearly 5000 households in a door-to-door fund-raiser. They find that asking donors to participate in a lottery raised approximately 50% more in gross proceeds than the voluntary treatment. Croson and Shang (2006) test social information and its impacts on charitable contribution in a on-air fundraising campaign. They find that social influence increases contribution on average 12% for all donors, and up to 29% for first-time donors.

Eckel and Grossman (2005, 2006) conduct two similar field experiments to compare the effects of rebates and matching subsidies for charitable contributions, varying the type of charity. In both cases, they find that the matching subsidy results in larger total contributions relative to their functionally equivalent rebate subsidy. Finally, Karlan and List (2006) also test matching and find that match contributions increases both the revenue per solicitation and the probability that an individual donates, but larger match ratios relative to smaller match ratios had no additional

[6]Both the SMarT and the SEED plan offer strong evidence that these commitment devices help individuals save more. The SMarT plan was implemented at three independent companies. For instance, in the first company investigated, the average savings rates for SMarT participants increased from 3.5 percent to 13.6 percent in the course of 40 months. Over twelve months, the SEED plan increased average savings balances by 80 percent for the treatment group, relative to the control group.

[7]Seed money implies that the charity first raises part of the money required for a project before they solicit money from the general public. The fact that other donors have already contributed sends a signal to the donors that it is an important project and more donors are then likely to follow as shown in the study.

impact.

3 The model

This section presents a simple framework to explain how donors' optimal contribution can be affected by time-inconsistent preferences. The model combines a model of warm-glow giving (Andreoni, 1989, 1990) with a model of quasi-hyperbolic preferences (see, e.g., Rabin and O'Donoghue, 1999).

Charitable contributions have been modeled as an individual deciding how much to contribute to a public good.[8] Even if the recipients of the charity are individuals who receive a private good, charitable giving, motivated by altruism, creates a public good out of charity. The fact that others feel altruistic toward these individuals means that private consumption of these goods becomes a public good. It is not possible to prevent non-contributors from also benefiting, nor is there a cost associated with others enjoying these benefits. The output of the charity is thus non-exclusive and non-rival in consumption.[9]

In the field experiment, a donor decides how much to contribute to foreign aid. The projects financed by Diakonia aim at supporting long-run sustainable development. To emphasize this fact, the charity has chosen to call the monthly donors "Sponsors for Change". Thus, there is a delay between the contribution to the charity (the cost) and the the realization of the public good (the benefit).

In addition to the benefit the donor receives from the realization of the public good, there is a second benefit from contributing to the charity, which is the warm-glow the donor may derive from giving. The warm-glow will be experienced at the time of committing to giving. This idea was first mentioned by Andreoni and Payne (2003) who write that "a commitment to a charity may yield a warm-glow to the givers before they actually mail the check. Hence, the benefits can flow before the costs are paid". In the experiment, we can expect the warm-glow to be realized at

[8] See Hochman and Rodgers (1969) and Kolm (1969) for the first papers that argue that charitable giving, motivated by altruism, creates a public good out of giving.

[9] For a more thorough discussion on this topic, see, e.g., Andreoni (2004) or Vesterlund (2006).

the time of commitment which is (1) at the time of payment in the GMN treatment and (2) before the time of payment in the GMT treatment.

Thus, we have two benefits from giving; the realization of a public good and the warm-glow from giving. In the GMN treatment, the delayed realization from the public good may cause donors to procrastinate and/or give less than the optimal amount. In the GMT treatment, the cost is delayed to help time-inconsistent donors overcome procrastination. Furthermore, the warm-glow now occurs before the payment. These two effects reinforce each other to increase donations in the GMT treatment as compared to the GMN treatment.

This section first presents donors' intertemporal preferences, and then turns to their instantaneous preferences. Finally, we combine the two models and compare the two cases tested in the field experiment. What is the optimal contribution when individuals are asked to "give more now" and when they are asked to "give more tomorrow"?

3.1 Intertemporal preferences

Assume that there are n individuals in the economy. Let u_{it} be a person i's *instantaneous utility* in period t. A person in period t cares about her present utility, but also about her future instantaneous utilities. Let $U_i^t(u_{it}, u_{it+1}, ..., u_{iT})$ represent person i's *intertemporal preferences* from the perspective of period t, where U_i^t is continuous and increasing in all components. The standard model in economics is exponential discounting. For all $t, U_i^t(u_{it}, u_{it+1}, ..., u_{iT}) \equiv \Sigma_{\tau=t}^{T} \delta^\tau u_{i\tau}$,where $\delta \in (0, 1]$ is a "discount factor".

Exponential discount functions capture that individuals are impatient, but assume that they are time consistent, i.e. a person's relative preferences for well-being at an earlier date over a later date are the same notwithstanding when she is asked. But intertemporal preferences might not be time consistent. Instead, people tend to exhibit a special type of time-inconsistent preferences that are called *quasi-hyperbolic* or *present-biased* (Laibson, 1997; O'Donoghue and Rabin, 1999). When considering trade-offs between two future moments, such preferences give a stronger relative weight to the earlier moment as it gets closer. Quasi-hyperbolic preferences can be represented by: for all t,

$$U_i^t(u_{it}, u_{it+1}, ..., u_{iT}) \equiv u_{it} + \beta \Sigma_{\tau=1}^{T-t} \delta^\tau u_{i,t+\tau} \tag{1}$$

where $0 < \beta, \delta \leq 1$. In this model, δ represents long-run, time-consistent discounting while β represents a "bias for the present". If $\beta = 1$, then preferences become exponential, while $\beta < 1$ implies present-bias preferences.

3.2 Charitable behavior

The model employs Andreoni's (1989, 1990) assumption of warm-glow giving to characterize charitable behavior. In this model, individuals do not only care about the overall provision of a public good, but also about the act of giving. This is thus a model of impure altruism from which the cases of pure altruism and pure warm-glow giving can be derived as special cases.[10]

Assume that each individual i in period t consumes a composite private good x_{it} and a public good G. Let an individual's contribution to the public good in period t be g_{it} and define $G_t = \sum_{i=1}^{n} g_{it}$. The feature that the individual does not only care about the provision of the public good, but also about the warm-glow g_{it} from her own donation is captured by directly adding an individual's donation in the utility function: $u_{it} = u_{it}(x_{it}, G_t, g_{it})$. For simplicity, it is standard in the literature to assume that there is a simple linear technology that implies a one-to-one transformation from private good to public good (Andreoni 2004). Furthermore, each individual is endowed with money income, m_{it}. The donor's budget constraint is $x_{it} + g_{it} = m_{it}$. The donor then faces the following optimization problem:

$$\max_{x,g} u_{it} = u_{it}(x_{it}, G_t, g_{it}) \tag{2}$$

[10] A donor is said to be *purely altruistic* if she only cares about the public good while *pure warm-glow giving* implies that the donor is only motivated by warm-glow and does not care about the overall level of the public good.

$$s.t.\ x_{it} + g_{it} = m_{it}$$
$$G_t = \sum_{i=1}^{n} g_{it}$$
$$g_{it} \geq 0$$

The model is solved by assuming a Nash equilibrium, i.e., it is assumed that each person i solves the maximization problem taking the contributions of the others as given. Let $G_{-i} = \sum_{i \neq j} g_i = G - g_i$ equal the total contributions of all individuals except person i. Then, under the Nash assumption, each person i treats G_{-i} as independent of g_i. Add G_{-i} to both sides of the budget constraint and to the fourth constraint. The optimization problem can be written with each individual choosing G_t rather than g_{it}:

$$\max_{x,G} u_{it} = u_{it}(x_{it}, G_t, G_t - G_{-it}) \tag{3}$$
$$s.t.\ x_{it} + G_t = m_{it} + G_{-it}$$
$$G_t = \sum_{i=1}^{n} g_{it}$$
$$G_t \geq G_{-it}$$

To illustrate how warm-glow can affect the level of charitable contributions, assume that the n individuals have identical Cobb-Douglas preferences and identical incomes $m_{it} = m$ that do not change over time. The instantaneous utility function for person i in each period t is then

$$u_{it} = \ln x_{it} + \alpha_1 \ln G_t + \alpha_2 \ln g_{it} \tag{4}$$

where α_1 is the pure altruism weight, i.e. how much the donor cares about the overall level of the public good, and α_2 is the weight the individual assigns to warm-glow.

We analyze the case with three time periods. In each period, the donor has exogenous income m. In the first period, the donor must commit to how much to contribute to the public good. The warm-glow from giving is received at the time of commitment. The actual payment will be made in either the first or the second period, while the public good is realized in the third and final period. It is assumed that the donor can make a credible commitment to giving. This is a strong, but realistic assumption in this setting. The advantage of using existing monthly donors is that the information on their bank accounts is already available to the charity. If the donor agrees to increase his monthly contribution, the charity implements the change in its computer system, and the donor is sent a letter confirming this change. If the donor wants to deviate from his commitment, he has to call the charity (or alternatively the bank) to stop the change from occurring. Thus, there is a cost of deviating, but no cost associated with complying with the commitment.

3.2.1 Behavior with Immediate Payment

This section analyzes the case where donors are asked to increase their payments immediately. In the first period, the donor decides on how much to give, makes the payment and receives the warm-glow from giving. The public good is realized in the third period. Substituting the instantaneous utility into the intertemporal utility function, we get:

$$\max_{x,G} U^t(u_{i1}, u_{i2}, u_{i3}) \equiv \ln x_{i1} + \alpha_2 \ln g_{i1} + \beta\delta[\ln x_{i2}] + \beta\delta^2[\ln x_{i3} + \alpha_1 \ln G] \tag{5}$$

$$s.t.\ x_{it} + G - G_{-i} = m \quad t = 1$$
$$x_{it} = m \quad t = 2, 3$$

Inserting the BC into the utility function and solving for the first-order condition give:

$$-\frac{1}{m - G + G_{-i}} + \alpha_2 \frac{1}{G - G_{-i}} + \alpha_1 \frac{\beta\delta^2}{G} = 0 \tag{6}$$

Since individuals are identical, the Nash equilibrium gift will be the same for all i, thus $G = ng^*$. The optimal contribution will then be:

$$g^*_{GMN} = \frac{\alpha_1\beta\delta^2 m/n + \alpha_2 m}{1 + \alpha_1\beta\delta^2/n + \alpha_2} \tag{7}$$

We see that g^*_{GMN} is increasing in $\boldsymbol{\beta}$ indicating that the more patient is the donor in the short run, the more she gives. Equally, it is increasing in δ indicating that the more patient is the donor in the long run, the more she gives.[11]

3.2.2 Behavior with delayed payment

This section analyzes what happens if the charity adopts a Give More Tomorrow Strategy (GMT). In the first period, the donor makes a commitment on how much to give, and receives the warm-glow for giving. In the second period, the donor makes the payment and the public good is realized in the third period. The donor now faces the following optimization problem:

$$\max_{x,G} U^t(u_{i1}, u_{i2}, u_{i3}) \equiv \ln x_{i1} + \alpha_2 \ln g_{i1} + \beta\delta[\ln x_{i2}] + \beta\delta^2[\ln x_{i3} + \alpha_1 \ln G] \tag{8}$$

$$s.t. \quad x_{it} + G - G_{-i} = m \qquad t = 2$$
$$x_{it} = m \qquad t = 1, 3$$

Once more inserting the BC into the utility function and solving for the first-order condition give:

$$\alpha_2 \frac{1}{G - G_{-i}} - \frac{\beta\delta}{m - G + G_{-i}} + \alpha_1 \frac{\beta\delta^2}{G} = 0 \tag{9}$$

The Nash equilibrium contribution is:

[11] Taking first derivatives, we see that g^*_{GMN} is increasing in m, increasing in α_1 (the parameter of pure altruism), increasing in α_2 (the parameter indicating warm-glow), and decreasing in n (the number of donors).

$$g^*_{GMT} = \frac{\alpha_1 \beta \delta^2 m/n + \alpha_2 m}{\beta\delta + \alpha_1 \beta \delta^2/n + \alpha_2} \tag{10}$$

We see that g^*_{GMT} is now decreasing in $\boldsymbol{\beta}$, indicating that the less patient the donor is in the short run, the more she gives. The effect of δ, the long-run discounting, is ambiguous and depends on the relative strength of the warm-glow parameter α_2 as compared to the pure altruism parameter α_1[12].[13]

Furthermore, the only difference between the optimal contributions in the GMN and GMT treatments is the term $\beta\delta$ in the denominator in (2.10). Thus, we have that $g^*_{GMT} > g^*_{GMN}$. The difference between the GMT and the GMN treatments will be greater if donors have present-biased preferences ($0 < \beta < 1$, and $\beta < \delta$) as compared to the case with time-consistent preferences ($\beta = 1$).[14]

The model thus predicts that there will be a difference between the GMT and the GMN treatments notwithstanding whether donors have time-consistent or preferences or not. But, the difference will be larger for donors with present-biased preferences as compared to time-consistent donors. How large this difference is will depend on the degree of present-bias among donors, i.e. the size of β. The smaller the β, the higher is the difference between the two treatment groups. [15]

[12] $\frac{\delta g_{GMT}}{\delta\delta} = \frac{\beta m n(\alpha_1 \beta \delta^2 - \alpha_2 n)}{(\alpha_2 n + \beta\delta n + \beta\delta\alpha_1)^2}$.

[13] Once more, taking first derivatives, we see that g^*_{GMT} is increasing in m, increasing in α_1 (the parameter of pure altruism), increasing in α_2 (the parameter indicating warm-glow), and decreasing in n (the number of donors).

[14] $g^*_{GMT} - g^*_{GMN} = \frac{(1-\beta\delta)[\alpha_2 m n^2 + \alpha_1 \beta \delta^2 m n]}{(\beta\delta n + \alpha_2 n + \alpha_1 \beta \delta^2)(n + \alpha_2 n + \alpha_1 \beta \delta^2)}$

[15] A special case, which nicely shows the intuition behind the experiment is when $\delta = 1$, i.e. when we can assume there to be no long-term discounting (cf. Akerlof, 1991; O'Donoghue and Rabin, 1999). In the field experiment, the delay between the commitment and the payment is a matter of months and a reasonable approximation is then that $\delta = 1$. In this case, for individuals with quasi-hyperbolic preferences $0 < \beta < 1$, it follows that $g^*_{GMT} - g^*_{GMN} > 0$. If individuals are time consistent ($\beta = 1$), then $g^*_{GMT} = g^*_{GMN}$.

3.2.3 Pure Altruists versus Warm-glow Givers

The above analysis assumes that individuals are impure altruists motivated by the realization of the public good *and* the warm-glow from giving. However, individuals might be pure altruists only motivated by the public good, or they might be solely motivated by the warm-glow from giving. We will call this latter group "warm-glow givers".[16] Does this affect the predicted outcome in the experiment?

The optimal level of contribution if all givers are pure altruists ($\alpha_2 = 0$) is, in the GMN case, $g^*_{GMN} = \frac{\alpha_1 \beta \delta^2 m/n}{1+\alpha_1 \beta \delta^2/n}$, and in the GMT case, $g^*_{GMT} = \frac{\alpha_1 \beta \delta^2 m/n}{\beta\delta+\alpha_1 \beta \delta^2/n}$.

If, on the other hand, all givers are warm-glow givers ($\alpha_1 = 0$),the optimal giving is, in the GMN case, $g^*_{GMN} = \frac{\alpha_2 m}{1+\alpha_2}$, and in the GMT case, $g^*_{GMT} = \frac{\alpha_2 m}{\beta\delta+\alpha_2}$. Once more, for individuals with present-bias preferences $0 < \beta < 1$, it follows that $g^*_{GMT} - g^*_{GMN} > 0$, and for time-consistent individuals ($\beta = 1$), $g^*_{GMT} = g^*_{GMN}$.

Once more, the only difference between the optimal contributions in the GMN and GMT treatments, for pure altruists *and* for warm-glow givers, is the term $\beta\delta$ in the denominator in the latter expressions. Thus, we have that $g^*_{GMT} > g^*_{GMN}$ in both cases. The difference between the GMT and the GMN treatments will be greater if donors have present-biased preferences ($0 < \beta < 1$, and $\beta < \delta$) as compared to the case with time-consistent preferences ($\beta = 1$). [17]

Hence, whether donors are motivated by pure altruism, impure altruism or warm-glow giving does not affect the prediction of behavior in the experiment. Due to normal discounting, there will be a difference between the GMT and the GMN treatments notwithstanding whether donors have time-consistent or preferences or not. But, the difference will be larger for donors with present-biased preferences as compared to time-consistent donors. How large this difference is will depend on the degree of present-bias among donors, i.e. the size of β. The smaller the β, the

[16] Note that, in the case of impure altriusm, the impact of pure altruism will become small as the number of donors grows large. As $n \to \infty$, donors will only be motivated by warm-glow. This is consistent with the model in Ribar and Wilhelm (2002).

[17] Making the same assumption as above that $\delta = 1$,. i.e. that the long-run discount factor can be approximated by 1, we see that, for individuals with present-bias preferences, $0 < \beta < 1$, it follows that $g^*_{GMT} - g^*_{GMN} > 0$. For time-consistent individuals ($\beta = 1$), $g^*_{GMT} = g^*_{GMN}$.

higher is the difference between the two treatment groups.[18]

4 Experimental Design

The field experiment was carried out in collaboration with Diakonia, one of the largest and most well-known charities in Sweden. Diakonia focuses on international aid. According to its policy document, "Diakonia is a Christian development organization working together with local partners for a sustainable change for the most exposed people of the world" (Diakonia, 2006). It is financed through private donations, but does also receive considerable support from the Swedish development agency SIDA. It has more than two thousand monthly donors. The monthly donors are called "Sponsors for Change" to emphasize the charity's goal to influence long-term sustainable development. This section describes the key design features of the field experiment, its implementation, and finally the hypotheses tested.

4.1 Key design features

There are three key features of the experimental design highlighted in this section; (1) the choice of charity, (2) the timing of the increase in the donation, and (3) the use of a telemarketing campaign.

First, the choice of charity reflects the theoretical foundations of the experiment in two ways. The donors are contributing to a cause without immediate results, but with positive long-term effects. Diakonia supports long-run sustainable development, which is emphasized in the information given to donors. Moreover, the donors have chosen to support poor individuals in foreign countries. Thus, donors should

[18] Once more, if $\delta < 1$, the prediction will be that the difference between the GMT and the GMN treatment will be larger for donors with present-biased preferences compared to time-consistent donors. How large this difference is will depend on the degree of present-bias among donors, i.e. the size of β. The smaller the β, the larger is the difference between the two treatment groups.

be motivated out of altruism or warm-glow rather than by private consumption or insurance motives.

Second, how did we choose the timing of the increase in donations? What is the optimal delay between commitment and payment in the GMT group? On the one hand, the lag should be long enough to overcome present-biased preferences. On the other hand, it should be as short as possible to minimize the cost to the charity. There is very little previous literature to guide us on this account. The SMarT scheme used the next pay increase as the time to increase savings, which implied a three-month lag between commitment and the first payment. In collaboration with the charity, we chose the lag to be two months, as one month might have been too short to overcome present-bias preferences and three months were potentially unnecessarily expensive for the charity. The charity's fund-raising campaign was planned for late October and beginning of November. A two-month lag thus implied January.

There would ideally be three treatment groups asking donors in the different groups to increase their donation (1) immediately, (2), in two months, and (3) in four months. If we could observe a difference between immediate payment and payment in two months, but not between two months and four months, this would be evidence of time-inconsistency.[19] The field setting only allows us to use immediate payment versus payment in two months as the charity has no incentives to allow a longer delay in payment. The result could thus reflect a normal discount rate and does not have to imply time-inconsistency. The magnitude of the implied discount rate will indicate whether the result reflects normal long-run discounting or a bias for the present. Studies of present-biased preferences have found short-run discount rates (β) to be around 0.5-0.7, and long-run discount rates (δ) about 0.95-0.97

[19]Laboratory studies of intertemporal choice typically ask a donor to choose between a smaller, more immediate reward and a larger, more delayed reward. The researcher then varies the delay and the amount of the reward. A classic example would be to first ask a subject to choose between \$10 today and \$ 12 in two days. Most subjects then prefer the immediate payment. When asked to choose between \$10 in a week and \$ 12 in one week and two days, the majority of subjects now choose the latter option. This behavior would imply time-inconsistent preferences. Frederick et al. (2002) provide an excellent review of these types of studies.

(Angeletos et al., 2001; Frederick et al., 2002).

A final aspect of the timing is that the profitability of the GMT strategy hinges upon donors giving over a longer time period. Monthly donors were targeted to minimize the difference in total cost between the two treatment groups. For a donor who contributes every month for many years, the cost difference between the GMN and GMT treatments is negligible. A company that asks buyers to "Buy Now, Pay Later" will generally demand high interest rate payments to compensate for the money lost during the lag between the purchase and the payment. A charity does not have that option. The profitability of the GMT scheme will depend on whether there is a positive effect on donations and whether this effect is sufficiently large to make up for the two months between commitment and payment.

Third, a telemarketing company was hired to call the donors. There are several advantages of using a telemarketing campaign in this setting. We know exactly how many donors that were reached, the identity of the donors, and the time of the decision. In addition, the response rate is considerably higher for telemarketing campaigns as compared to mail solicitations. The callers ensured that the person making the decision is the person whose name is on the bank account. Thus, we get valuable information on donor characteristics and it could not be a collective household decision. The disadvantage of using a telemarketing campaign is the possibility of there being differences in callers characteristics, including ability. To ensure that there was no such experimenter effect, each caller called on both treatment groups.

4.2 Implementation

The experiment took place within one of the Charity's regular fund-raising campaigns and aimed at increasing the existing donors' monthly contributions. It targeted more than 1200 monthly donors. The targeted donors were chosen on basis of their not already having increased their donation in the past year and that they were less than 80 years old.

The donors were randomly divided into two treatment groups. The difference between the two treatment groups was the timing of the increase in the donation. The experiment was carried out between October 18 and November 21, 2005. The monthly contributions are automatically deducted from the donor's account on the 28th of every month. In treatment one, the first increase in the monthly donation then took place on November 28, while in treatment two, the first increase occurred on January 28. The delay in payment between group GMN and group GMT was thus two months.

A telemarketing company, specializing in helping charitable organizations, was contracted to call the donors and ask them to increase their donations. The callers followed a pre-written manuscript. In collaboration with the charity, two manuscripts were produced that were identical in all respects but the timing of the increase in the donation.

The outline of the manuscript was the following; The callers first thanked the donors for contributing to the Charity and then provided examples of projects financed by the donors' contributions.[20] The next step was to ask the donor if they would consider increasing their monthly donation. The following citation shows the difference in language between treatment one and treatment two.

Treatment 1: Give More Now (GMN). "We would like to ask you, who are a Sponsor for Change, if you have the possibility of increasing your contribution?"

Treatment 2: Give More Tomorrow (GMT). "We would like to ask you, who are a Sponsor for change, if you have the possibility of increasing your contribution beginning in January 2006?"

If the donor said no, the caller thanked him/her for the current support. If the donor was hesitant, the caller emphasized that any amount, no matter how small, would be valuable and appreciated. If the donor agreed to increase the donation, the caller informed him/her that a letter confirming the change would be sent to the donor, repeating the agreed upon increase in the donation and the date when

[20] Two projects presented to the monthly donors as examples of the activities they are financing are (1) Working for debt relief for poor countries, and (2) Farming education for poor individuals in Cambodia so as to make them self-reliant.

the first increase would occur[21]. The caller then thanked the donor for her support and wished the donor a pleasant evening/day.

4.3 Hypotheses

The results can be analyzed both by the level of increase in donations and the frequency of increase in donations. The main assumption to be tested is that a delay in the first payment increases mean donations against the alternative that there is no effect of the delay. Let x_{ij} denote a donation of donor j $(j = 1, ..., n)$ in treatment i $(i = 1, 2)$, where treatment 1 is the "Give More Now" group and treatment 2 is the "Give More Tomorrow" group. Furthermore, let μ_i denote the mean increase in treatment i and let f_i denote the frequency of positive donations in treatment i. When a donor decides to increase his/her monthly contribution, we say that a donor *upgrades* the contribution. Then, we test the following three main hypotheses about donor behavior.

$\mathbf{H}_1$: The increase in donations is higher when donors are allowed to postpone the first payment. In other words, the average increase should be higher in treatment 2 (GMT) than in treatment 1 (GMN). Hence, we get the following null hypothesis $H_1 : \mu_1 = \mu_2$.

$\mathbf{H}_2$: The increase in donations is higher when donors are allowed to postpone the first payment, conditional on upgrading. In other words, the average increase should be higher in treatment 2 (GMT) than in treatment 1 (GMN) among the donors that upgrade their contributions. Hence, we get the following null hypothesis $H_2 : (\mu_1 | x_{1j} > 0) = (\mu_2 | x_{2j} > 0)$.

$\mathbf{H}_3$: The share of donors that increase their monthly contribution is higher when donors are allowed to postpone the first payment. The frequency of increases should therefore be higher in treatment 2 (GMT) than in treatment 1 (GMN). We get the following null hypothesis $H_3 : f_1 = f_2$.

[21] Note that the letter was sent only to inform the donor of the change. The donor did not have to send any information back to the charity. Since the donor had already given the charity its bank account number, the charity could directly implement the agreed upon change in the monthly contribution.

The three hypotheses are tested against the alternative that the mean increase in donation is not equal. If, as hypothesized above, mean increases in contributions are higher when the payment is delayed, i.e. if we can reject the null hypotheses that the increases in contributions are independent of the treatment, we may conclude that there is such a thing as a precommitment effect increasing the willingness to give.

5 Results

More than 1200 donors were called, 553 of which were reached in group GMN and 581 in group GMT. The total number of observations was thus 1134. This section first presents the summary statistics from the experiment and then turns to the statistical analysis and robustness tests. Furthermore, we follow up the original study with data on contributions one year after the field experiment to invetigate the long-term effects of the GMT strategy.

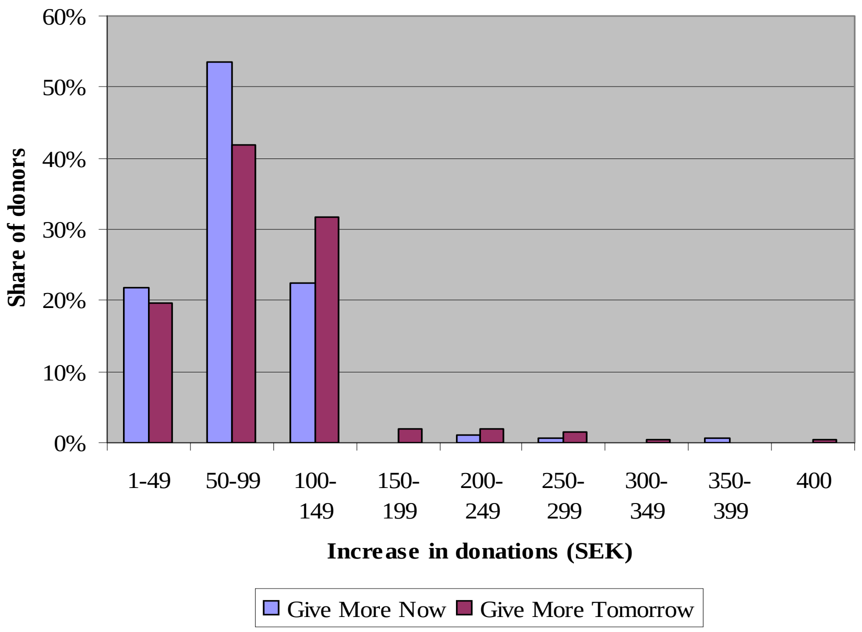
5.1 Descriptive statistics

More than 30 percent of the donors contacted through the fund-raising campaign agreed to increase their donations. Figure 1 shows the distribution of increases in donations conditional on upgrading. The median increase in donations was SEK 50 in both treatment groups. However, increases of SEK 100 or more were more common in group GMT relative to group GMN.

Table 1 gives the summary statistics for the experiment. Mean increase in donations were 32% higher in the GMT group relative to the GMN group. This result is driven by the fact that both average increase in donations and the share of donors upgrading were higher in the GMT treatment. Mean increase in donations conditional on upgrading were 19% higher, while the frequency of upgrades was 11% higher.

Furthermore, data on donor characteristics is presented in table 2. The average (median) age of the donor participating is 55 (58) years in the GMN treatment

Figure 1
Distribution of increases in donations, conditional on upgrading
(1 USD = SEK 7.50)



and 59 (61) in the GMT treatment. The average (median) contribution before the fund-raising campaign took place was SEK 148 (100) and SEK 133 (100) in the GMN and GMT groups, respectively[22]. Women are somewhat overrepresented in the GMT group at 60 percent compared to 52 percent in the GMN treatment. Despite the randomization, there are some differences in donor characteristics.[23] This could cause the results to be biased if women and men behave differently or if age is of importance for charitable behavior. To test whether this is the case, section 5.3 presents the results from regressing the increase in donations on a treatment dummy, controlling for donor characteristics using OLS and Tobit regressions.

[22] SEK 100 $\simeq$ USD 12.

[23] We test whether there are any significant differences in donor characteristics between the two treatment groups. Using t-tests, we cannot reject that the mean donation before the experiment is the same in the two treatment groups (p=.20), but we can reject that the average age (p=.00) and the frequency of women (p=.01) are the same in the two treatment groups.

Table 1: Summary Statistics

Treatment group	GMN	GMT	Treatment effect
Increase in mean donation (SEK)	18.6	24.64	32.4%
Standard Deviation	35.84	45.58	
Number of observations	553	581	
Increase in mean donations, conditional on upgrading (SEK)	60.53	72.30	19.4%
Standard deviation	40.54	51.52	
Number of observations	170	198	
Share of donors upgrading	30.7%	34.1%	11.1%

Table 2: Donor characteristics

Treatment group	Give More Now	Give More Tomorrow	Full sample
Average age	55	59	57
Median age	58	61	60
Average contribution	148	133	141
Median contribution	100	100	100
Share women	52%	60%	56%

5.2 Statistical analysis

This section presents the results from the statistical analysis of the experimental results. Since most donors did not increase their donations, the distribution of increases in donations is highly skewed towards zero. To test equality of means, double-sided t-tests and the non-parametric bootstrap method are used. Considering the large sample size, t-tests should provide unbiased estimates, and the bootstrap methos is used as a robustness test. Unlike t-tests, bootstrapping does not require that the underlying population is normally distributed, only that the observed distribution of the sample is a good estimate of the underlying population distribution (Efron and Tibshirani, 1993). The bootstrapping method consists of drawing with replacement N independent bootstrap samples from the observed sample. Each new sample is of the same size as the observed sample. For each bootstrap replication, a t-test is calculated. The p-value is based on the number of times the bootstrapped t-test is greater or equal to the original t-test calculated from the observed sample.

Table 3 also reports the Pearson's chi2 test, which is used to test the equality of frequency of donors upgrading in the two treatment groups (D'Agostino et al., 1988). The null is that the frequency of increases in donations is the same in the two treatment groups.

Table 3: Bootstrapping, T-test and Pearson chi2

	Bootstrap	**T-test**	**Pearson chi2**
Null Hypothesis	$\mu_1 = \mu_2$	$\mu_1 = \mu_2$	$f_1 = f_2$
Full sample			
p-value	.0096	.013	.23
Number of observations	1134	1134	1134
Conditional on giving			
p-value	.014	.015	
Number of observations	368	368	

Hypothesis 1 and hypothesis 2 that say that increases in mean donations are equal in the two treatment groups for (1) the full sample and (2) the sample conditional on upgrading can be strongly rejected. The t-tests reject the null hypothesis of equal means in groups GMN and GMT for the full sample (p=0.013) as well as conditional on upgrading ($p = 0.015$). Bootstrapping confirms this result. Table 3 shows that we can reject the hypothesis of equal means, both for the full sample ($p < .01$) and for the reduced sample conditional on upgrading ($p = .014$). Hence, the effect on mean donations of allowing donors to Give More Tomorrow is both statistically significant and economically large.

Furthermore, the frequency of donations was higher in the GMT treatment relative to the GMN treatment. It is, however, not possible in a double-sided Pearson's chi2 test to reject the third hypothesis that the number of donors upgrading their contributions is equal in the two treatment groups (p=0.23). We also preformed probit regressions to test whether the probability of increasing your donation was higher in the GMT groups as compared to the GMN group. Consistent with the Pearson's chi2 test, we do not find that donors are significantly more likely to increase their contributions in the GMT treatment.[24] The significant increase in mean donations was thus mainly driven by an increase in the level of donation, rather than the frequency of donors upgrading.

Is the treatment effect sufficiently large to make this strategy profitable for the charity? Allowing donors to postpone the increase in donation for two months reduces the short-run revenue of the charity. It takes approximately six months of the higher level of donations in group GMT to make up for the two-month delay in payment. More specifically, donors in the GMN group increase their contributions from November and those in the GMT group from January, and the GMT group will thus be profitable in July. From then onwards, the GMT strategy will yield 32% higher increases in donations each month relative to the GMN group. The average

[24]In the probit regressions, none of the explanatory variables - "GMT treatment", "female", "age", "original donation" or "nix" - are significant.

"Sponsor for Change" makes monthly contributions for seven years. The GMT strategy should thus be profitable for the charity, provided that the cancellation rates are not higher in the GMT treatment as compared to the GMN treatment.

5.3 Regressions controlling for observed characteristics

To control for donor characteristics, this section regresses the increase in donations on a treatment dummy and the observed donor characteristics. We first run OLS regressions with robust standard errors on the full sample (OLS1) and the sample conditional on upgrading (OLS2). However, since the full sample is censored from below at zero, we also perform a Tobit regression.

The data includes information on the sex and age of the donors and their monthly contribution before the experiment. These donor characteristics can potentially influence behavior in the experiment. In laboratory experiments, such as the dictator game and ultimatum games, women tend to donate more than men, while laboratory evidence on age is scarce.[25] On the one hand, an income effect could cause older, retired donors to increase their donations less than younger individuals. On the other hand, many wealthier individuals turn to philanthropy at an older age. The effect of the sum donated before the experiment is not clear either. The original donation can be seen as a proxy for generosity, but it could equally reflect an income effect, making it a weak measurement of generosity.[26]

An additional explanatory variable, labeled "nix", is used in the regressions. It is a dummy that equals one for those donors who generally do not want to be approached by telephone salesmen, but who have given their phone numbers to the charity. These donors might be more negative towards fund-raising campaigns conducted by telephone, and can therefore be expected to increase their monthly contributions less.

The results are presented in table 4. A few results are noteworthy. First, the treatment dummy is significant in all specifications. The coefficient on the treatment dummy in OLS1 ($p<0.01$) implies that the mean increase in donation is SEK 7.21 higher on average in the GMT treatment relative to the GMN treatment. The treatment effect is higher than in the experiment, where the difference is SEK 6.03.

Second, the gender dummy (which is equal to one for women and zero for men) is negatively correlated with an increase in donations. The effect is large, but

[25] There is some evidence on younger children, but evidence on other age groups is rare. See Camerer (2003) for an overview of existing literature.

[26] Ideally, we would have collected data on income and wealth, but the charity does not have that kind of information about their donors. The fact that the study is a field experiment makes it impossible to collect the data through a questionnaire.

Table 4: Donors characteristics and sum donated: OLS and Tobit

Dependent variable: *Increase in donation*	**OLS1** **Full sample**	**OLS2** **Conditional on upgrading**	**Tobit** **Full sample**
Constant	30.77***	52.47***	-15.37
	(5.86)	(13.52)	(15.39)
GMT Treatment dummy	7.21***	9.92**	16.47**
	(2.53)	(4.76)	(7.08)
Age	-.17**	-.17	.-44*
	(.08)	(.18)	(.22)
Female	-4.08	-2.44	-12.17*
	(2.55)	(4.76)	(7.07)
Original donation	.008	.18***	-.00
	(.008)	(.03)	(.02)
Nix	-6.51**	-16.23***	-12.41
	(2.57)	(4.39)	(8.02)
F-test	2.85	11.02	11.37
p-value	(.01)	(.00)	(.04)
R^2	.017	.173	.002
Number of observations	1134	368	1134

Note: Robust standard errors in parentheses.

insignificant in all specifications except the Tobit regression (p<0.10). Contrary to previous experimental results, women increase their donations less generously than men. This result could be driven by the fact the women, on average, have a lower income than men.

Third, age is negatively correlated with the increase in the sum donated in OLS1 and Tobit, indicating that the older the donor, the lower the increases in donations. The effect is significant, but small.

Fourth, increases in donations do not seem to be determined by the level of contribution before the experiment. The coefficient on the original sum donated is close to zero and insignificant in OLS1 and Tobit. In OLS2, where only donors upgrading their contributions are included, the coefficient is highly significant (p<0.01) and positive. The effect is very small, however.

Fifth, the variable "nix", indicating reluctance against telephone campaigns is as expected negatively and significantly correlated with the increase of the sum donated. It is noteworthy that many of the donors in this category did increase their donations (31.6%), but with a lower amount compared to the donors not in this category.

Some further robustness analyses can be found in the appendix. While this section analyzed the effect of donors characteristics on the level of donations, controlling for a treatment effect, the appendix investigates whether men and women repond differently to the treatment effect itself. The same is done for different age groups. While we find no evidence of differences in the treatment effect between different age groups, there is a difference in the response to the GMT treatment between men and women. The GMT treatment is significant for both men and women, but it significantly larger for men (for more details, see the appendix).

The OLS and Tobit regressions show that the main result, that the GMT strategy has a positive and significant impact on donations, is robust to controlling for donor characteristics. Moreover, we see in some cases, donor characteristics are related to charitable behavior. After controlling for the treatment effect, women and older individuals tend to increase their donations less as compared to men and younger individuals. These are also the groups that are somewhat over-represented in the GMT group, which could lead to a downward bias in the experimental results. If anything, the magnitude of the GMT effect was underestimated in the experiment.

5.4 Follow-up results

Do donors deviate from the increases in contributions that they committed to in the experiment? Are there any differences in changes in donations, including cancellation rates, between the two treatment groups? To answer these questions, data on monthly contributions were gathered in October 2006, i.e. 12 months after the implementation of field experiment. This data is important for several reasons. First, the profitability of the GMT strategy hinges upon donors giving for a longer period of time (at least six months), and that the cancellation rates are not different between the two treatment groups. Second, the GMT strategy was designed to help donors with hyperbolic preferences to overcome their bias for the present, and to induce them to give according to their long-run preferences. If there are more donors cancelling their monthly contributions in the GMT treatment as compared to te GMN treatment, this would imply that the GMT strategy induced donors to give more than what is sustainable in the long-run. On the other hand, the absence of a difference in dropout rates between the two treatment groups indicates that donors were giving too little previous to the field experiment.

Table 5 shows the changes in monthly contributions divided into (i) increases in donations, (ii) decreases in donations (iii) cancellations, (iv) deceased donors,

Table 5: Changes in monthly contributions and cancellation rates

Treatment group	**GMN**	**GMT**	**Total**
Increases in donations			
Number of donors	16	13	29
(percentage)	2.9%	2.2%	2.6%
Mean change in donations (SEK)	128	133	130
Decreases in donations			
Number of donors	5	2	7
(percentage)	0.9%	0.3%	0.6%
Mean change in donations (SEK)	-70	-125	-86
Cancellations			
Number of donors	20	19	39
(percentage)	3.6%	3.3%	3.4%
Mean change in donations (SEK)	-127	-100	-114
Deceased			
Number of donors	1	4	5
(percentage)	0.2%	0.7%	0.4%
Mean change in donations (SEK)	-300	-150	-180
Total long-run changes			
Number of donors	42	38	80
Percentage	7.6%	6.5%	7.1%
Total mean change in donations (SEK)	-2.07	-1.76	-1.91
Number of observations	553	581	1134

and (v) the total long-run changes in donations combining the previous four categories[27]. The first noteworthy result from the follow-up data is the low number of cancellations. One year after the field experiment was implemented, 96.6% of donors have chosen to remain as monthly contributors. Moreover, although these donors were not contributing regularly anymore, none of the donors cancelling have stopped giving altogether. They remain in the donor database, and they are still contributing ocassionally[28]. The share of donors cancelling their monthly contribu-

[27]This reflects the difference between mean monthly contribution after the field experiment and the follow-up data. It includes all changes made in donations over the year, including deceased donors. It does not include donations by those donors who have chosen to end their monthly contributions, but still give occasional donations. It therefore underestimates the total revenue the charity receives from the original sample. The donations have decreased somewhat more in the GMN treatment as compared to the GMT treatment, but the difference between the two treatment groups is not significant.

[28]In addition to the 39 donors cancelling their monthly donations, there are 5 deceased donors whose monthly donations were cancelled.

tions are almost identical in the two treatment groups; 3.6% in the Give More Now treatment, and 3.3% in the Give More Tomorrow treatment, respectively.

Furthermore, there are few donors lowering their monthly contributions; 0.9% of donors in the GMN group as compared to 0.3% of donors in the GMT group. On the other hand, there were 2.9% of donors in the GMN group and 2.2% of donors in the GMT that chose to increase their donations in the following year.

What is the total effect of the increases, decreases and cancellations? In table 5, we see that the total difference in monthly contributions is SEK -2.07 ($\simeq$ USD 0.28), and SEK -1.76 ($\simeq$ USD 0.23) in the GMN and GMT groups, respectively. The difference is not statistically significant, and we can conclude that there are no long-run negative effects on donations from the GMT treatment as compared to the GMN treatment.

Table 6: Long-run treatment effects

Treatment group	**GMN**	**GMT**	**Treatment effect**
Long-run increase in mean donation (SEK)	16.54	22.88	38.4%
Standard Deviation	57.85	61.45	
Number of observations	553	581	
Increase in mean donations, conditional on upgrading (SEK)	52.47	71.44	36.2%
Standard deviation	57.36	78.68	
Number of observations	170	198	
Share of donors upgrading	27.1%	30.8%	13.6%

Table 6 shows the long-run treatment effects, i.e. the mean increase in donations before the experiment (October 2005) as compared to one year after the experiment (October 2006). The long-run treatment effect for the full sample is 38.4%, which is slightly higher than the short-run treatment effect. The difference is due to the slightly higher cancellation rate in the GMN treatment as compared to the GMT treatment. The same is true for the long-run treatment effect conditional on upgrading (36.2%), and for the share of donors upgrading (13.6%). This further strengthens the conclusion that there is no evidence of a negative effect of the GMT treatment in the long-run.

6 Discussion

How do we interpret the 32 percent treatment effect? Can we take this as evidence of hyperbolic preferences among donors or is there an alternative explanation? This section discusses four alternative explanations and how they can be interpreted in relation to the follow-up data; (1) normal discounting; (2) a rebate effect; (3) consumption smoothing; and (4) a Christmas/New Year effect.

First, normal discounting should also result in a difference in increases in donations between the two treatments groups. We expect the difference to be larger for time-inconsistent donors as compared to time-consistent donors. Previous studies of present-biased preferences have found short-run discount rates (β) around 0.5-0.7 and long-run discount rates (δ) to be about 0.95-0.97 (Angeletos et al., 2001; Frederick et al., 2002). Thus, the magnitude of the treatment effect indicates that hyperbolic discounting is a better explanation than exponential discounting.

A second explanation worth exploring is a rebate effect. The donors in the Give More Tomorrow treatment are given a two month delay on the increase in contributions. We can calculate how long donors are planning to give to make the higher increases in contributions consistent with a "rebate" theory. It is the same time it takes for the charity to recover the rebate, i.e. six months. The follow-up study shows that the vast majority of donors are still contributing on a monthly basis one year after the study, and that the cancellation rates are almost identical in the two treatment groups. This evidence is not consistent with the rebate hypothesis.

A third reason for the higher increases in donations in the GMT treatment is consumption smoothing. The mean increase in monthly donation among upgrading donors is SEK 67 ($\simeq$USD 8.9), while the mean annual income per person in Sweden is SEK 210 500 ($\simeq$USD 28 000) (Statistics Sweden, 2003). It is not likely that a donor needs to change consumption patterns to afford this increase in contributions.

A fourth factor to take into consideration is the timing of the increase in donations in the GMT treatment. The telemarketing campaign was carried out in late October and early November 2005, and the increase in donations in the GMT treatment group was January 2006. Could there be a Christmas/New Year effect? There are facts that speak against a Christmas effect. First, charitable contributions are not tax deductible in Sweden. There are no tax advantages of starting the increase in donations in January. Second, there are two ways in which the experiment is biased against finding an effect of the GMT treatment. First, it is a well-known fact among charities that generosity is the highest at Christmas. If the upcoming Christmas is influencing donor decisions already in October and early November, it should bias the results against the treatment effect. Second, due to high spending during Christmas, January is the month of the year when households' disposable incomes are the lowest.

The evidence supporting the theory of present-biased preferences among donors is the magnitude and sustainability of the treatment effect. If the GMT treatment induced people to give more than their optimal amount, we would expect to find a difference in cancellation rates between the two treatment groups, or alternatively to see many donors lowering their contributions in the GMT treatment as compared to the GMN treatment. The follow-up data clearly refutes that theory. The higher increases in donations in the GMT treatment are clearly sustainable in the long-run, indicating that the GMT treatment did help donors to overcome their bias for the present.

7 Conclusion

This field experiment shows that a charity can boost donations by using a simple strategy allowing donors to pre-commit to future donations. The mean increase in donations is 32 percent higher in the Give More Tomorrow treatment as compared to the Give More Now treatment. The effect is both statistically significant and highly profitable to the charity. After 12 months, 96.6 percent of donors have chosen to stay in the monthly contribution scheme and cancellation rates are nearly identical in the two treatment groups.

What do these results suggest for future research? This study focuses on foreign aid with long-term goals. Research on other types of charitable giving will shed further light on intertemporal choice in this setting. Would the results hold for within-country studies where donors could be motivated by private consumption and insurance motives? What happens if the donors are contributing to a cause with immediate rather than long-term effects? Furthermore, what is the effect of the GMT strategy if we test a different population, i.e. donors that have not already committed to giving? This could be done, for example, by testing the GMT strategy in a campaign aiming at recruiting new monthly donors.

Finally, what do our results suggest for policy? A revenue maximizing charity should combine monthly contribution schemes with fund-raising campaigns that implement the Give More Tomorrow strategy. Monthly donors are highly profitable to a charity. However, simply asking donors to increase their contributions is not the best way to boost monthly donations. This study shows that mean increases in donations are significantly higher when donors are asked to precommit to future increases in donations as compared to when they are asked to increase donations immediately. The follow-up study shows that this result holds, not only in the short-run, but also in the long-run.

8 References

Akerlof, G. A. (1991). Procrastination and Obedience. *American Economic Review,* 81(2):1-19.

Andreoni, J. (1989). Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy,* 97(6):1447-1458.

Andreoni, J. (1990). Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving. *The Economic Journal,* 100(401):464-477.

Andreoni, J. (2004). Philanthropy. In Gerard-Varet, L.-A., Kolm, S-C. and Ythier, J.M. (Eds.). *The Handbook of Giving, Reciprocity and Altruism.* In the series Handbooks in Economics, K. Arrow and M.D. Intriligator, General Editors.

Andreoni, J. and Payne, A.A. (2003). Do Government Grants to Private Charities Crowd Out Giving or Fund-raising? *American Economic Review,* 93(3): 792-811.

Angeletos, G.-M., et al. (2001). The hyperbolic consumption model: calibration, simulation and empirical evaluation. *Journal of Economic Perspectives,* 15(3):47-68.

Ashraf, N., Karlan, D. and Yin, W. (2006). Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines. *Quarterly Journal of Economics,* 121(2): 635-672.

Camerer, C. F. (2003). *Behavioral Game Theory.* New Jersey: Princeton University Press.

Croson, R. and Shang, J. (2006). Field Experiment in Charitable Contribution: The Impact of Social Influence on the Voluntary Provision of Public Goods. Mimeo, University of Pennsylvania.

DellaVigna, S. and Malmendier, U. (2006). Paying Not To go To The Gym. *American Economic Review,* 96 (3): 694-719.

Diakonia. (2006). *Diakonia's policy - adopted in 1998.* Available at:
http:\\www.diakonia.se.

Eckel, C., C. and Grossman, P., H. (2005) Subsidizing Charitable Contributions in the Field: Evidence from a Non-Secular Charity. Mimeo, University of Texas at Dallas.

Eckel, C., C. and Grossman, P., J. (2006). Subsidizing Charitable Contributions: A Field Test Comparing Matching and Rebate Subsidies. Mimeo, University of Texas at Dallas.

Eisensee, T., and Strömberg, D. (2007). News Droughts, News Floods and U.S. Disaster Relief. Quarterly Journal of Economics, *forthcoming,* 122:2, 2007.

Efron, B. and Tibshirani, R.J. (1993). *An introduction to the bootstrap.* New York: Chapman and Hall.

Falk, A. (2004). Charitable Giving as a Gift Exchange: Evidence from a Field Experiment. IZA DP No. 1148.

Frederick, S., Loewenstein, G. and O'Donoghue, T. (2002). Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature,* 40(2): 351-401.

Harrison, G.W. and List, J.A. (2004). Field Experiments. *Journal of Economic Literature.* 42(4):1009–1055.

Hochman, H.M., and Rodgers, J.D. (1969). Pareto Optimal Redistribution. *American Economic Review,* 59:542-57.

Karlan, D. and List, J. A. (2006). Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment.

Mimeo, Yale University.

Kolm, S. Ch. (1969). The Optimal Production of Social Justice. In J. Margolis and H. Guitton, (eds.), *Public Economics: An Analysis of Public Production and Consumption and their Relations to the Private Sectors,* London: McMillan Press, 145-200.

Krusell, P. and Smith, A.A. Jr. (2003). Consumption-Savings Decisions with Quasi-Geometric Discounting. *Econometrica,* 71:365-375.

Laibson, D. (1997). Golden Eggs and Hyperbolic Discounting. *Quarterly Journal of Economics,* 112 (2):443-77.

Landry et al. (2005). Towards an understanding of the economics of charity: Evidence from a field experiment. NBER Working Paper 11611.

List, J.A. and Lucking-Reiley, D. (2002). The Effects of Seed Money and Refunds on Charitable Giving: Experimental Evidence from a University Capital Campaign. *The Journal of Political Economy,* 110(1): 215-233.

Lowenstein, G., and Thaler, R.H. (1989). Anomlies: Intertemporal choice. *Journal of Economic Perspectives,* 3(4): 181-193.

O'Donoghue, T and Rabin, M. (1999). Doing It Now or Later. *American Economic Review,* 89(1): 103-124.

O'Donoghue, T. and Rabin, M. (2001). Choice and Procrastination. *Quarterly Journal of Economics,* 116(1):121-160.

Phelps, E.S. and Pollak, R.A. (1968). On Second-Best National Saving and Game-Equilibrium Growth. *Review of Economic Studies*, 35(2):185-99.

Phelps, E.S. (1972). *Inflation Policy and Economic Theory.* New York: Norton; London: Macmillan.

Riksförsäkringsverket. (2004). Medelpensionsålder. *RFV Redovisar. 2004:11.* Stockholm.

Saez-Marti, M. and Weibull, J. (2005). Discounting and altruism to future decision-makers. *Journal of Economic Theory,* 122:254-266.

Samuelson, W. and Zeckhauser, R.J. (1988). Status Quo Bias in Decision Making. *Journal of Risk and Uncertainty,* 1:7-59.

Thaler, R. H. and Benartzi, S. (2004). Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving. *Journal of Political Economy,* 112:S164-S187.

Vesterlund, L. (2006). Why Do People Give? In Richard Steinberg and Walter W. Powell (eds.), *The Nonprofit Sector, 2nd edition*, New Haven: Yale University Press, Forthcoming.

9 Appendix

9.1 Gender differences

Section 5 analyzed the effect of donor characteristics on the level of donations controlling for a treatment effect. In this section, we investigate whether men and women respond differently to the GMT treatment itself. More specifically, do women and men exhibit different degrees of present-bias in their preferences?

There is some evidence that this might be the case. Ashraf et al. (2006) conduct a baseline survey before implementing the SEED plan in the Philippines, which indicates that women exhibit a lower discount rate for the future relative to current trade-offs. The study also shows that women, to a larger extent than men, use the commitment savings scheme offered in the experiment.

Table 7: Summary statistics, gender differences

Treatment group	**GMN**	**GMT**	**Treatment effect**
Men			
Increase in mean donation (SEK)	20.0	27.8	38.6%
Standard Deviation	35.2	53.9	
Number of observations	268	235	
Increase in mean donations, conditional on giving (SEK)	60.3	77.7	28.7%
Standard deviation	36.1	65.4	
Number of observations	89	84	
Women			
Increase in mean donation (SEK)	17.3	22.5	30.4%
Standard Deviation	36.4	38.8	
Number of observations	285	346	
Increase in mean donations, conditional on giving (SEK)	60.7	68.3	12.5%
Standard deviation	45.1	38.0	
Number of observations	81	114	

Table 5 presents summary statistics for this experiment, showing the increase in donations for men and women separately. Considering the full sample, we note that the treatment effect is a 39 percent increase in donations for men, while the corresponding effect is 30 percent for women. The treatment effect conditional on upgrading is considerably larger for men at 29 percent, versus 13 percent for women.

To investigate whether the treatment effect is significant for men and women separately, we once more use t-tests and bootstrapping. The null hypothesis is that mean donations are equal in the two treatment groups (1) for the full sample, and (2) conditional on upgrading. The results are presented in table 6. We see that the difference in the donation is significant for men both for the full sample (p = 0.06) and conditional on giving (p = .04). The difference is significant for women only for the full sample (p = .09) and not for the sample conditional on upgrading (p = .23). The corresponding t-tests give the same results.

Table 8: Bootstrapping, T-tests, Gender differences

	Bootstrapping		**T-test**		**T-test**
	Men	**Women**	**Men**	**Women**	**Difference**
Null Hypothesis	$\mu_1 = \mu_2$	$\mu_1 = \mu_2$	$\mu_1 = \mu_2$	$\mu_1 = \mu_2$	$\triangle\mu_m = \triangle\mu_w$
Full sample					
p-value	.06	.09	.06	.08	>.10
Number of observations	503	631	503	631	1134
Conditional on giving					
p-value	.04	.23	.03	.22	<.01
Number of observations	173	195	173	195	368

Finally, table 6 also presents the result from testing whether the treatment effect is higher for men than it is for women. The null hypothesis is that the increase in donations in response to the GMT treatment is equal for men and women. For the full sample, we cannot reject that the treatment effect is of the same magnitude for men and women (p>.10). However, conditional on upgrading, we can reject that men and women respond equally to the treatment effect (p<.01). The result indicates that both men and women exhibit present-bias preferences, but that the effect is larger for men than it is for women. The increase in donations for men is mainly driven by an increase in donations conditional on upgrading, while for women the overall positive effect is driven by an increase in the frequency of donations.

9.2 Age differences

As with gender, we want to test whether age may influence the response to the treatment in the experiment. There are potentially two channels through which age may affect behavior. First, learning may move individuals from having present-biased preferences towards time-consistency. If time-consistency increases with age, we should see that the difference between donations in the GMN and the GMT treatments should be smaller for older donors as compared to younger ones.

Second, the number of months that the donor expects to continue giving should be shorter, the older is the donor. This should cause older donors to give more, on average, than younger ones.

Table 9: Summary statistics, age differences

Treatment group	**GMN**	**GMT**	**Treatment effect**	**T-test** $\mu_1 = \mu_2$ p-value
Young, age <30				
Increase in mean donation (SEK)	15.9	22.2	39.7%	.63
Standard Deviation	50.3	56.9		
Number of observations	55	27		
Middle aged, 30≤age≤60				
Increase in mean donation (SEK)	22.1	29.4	32.8%	.06
Standard deviation	36.0	50.3		
Number of observations	261	256		
Old, age>60				
Increase in mean donation (SEK)	15.3	20.8	35.3%	.08
Standard Deviation	31.3	39.5		
Number of observations	237	298		
Very old, age>70				
Increase in mean donation (SEK)	13.0	17.6	35.6%	.18
Standard deviation	25.4	32.0		
Number of observations	131	152		

Table 7 presents summary statistics for donors by age group. Donors are divided into four age groups related to their income. Young donors (age < 30) are students and those who are relatively new in the labor force. Middle aged ($30 \leq$ age ≤ 60) represents most individuals participating in the labor force while old are those aged above 60. The legal retirement age in Sweden is 65, but the average retirement age is 61 (RFV, 2004). Finally, there is a category "very old" (age > 70) which is a subgroup to the category "old" where the vast majority can be expected to be retired.

We see that the treatment effect is of similar magnitude in all age groups, but only significant for middle aged and old.[29] These findings contradict learning. Older donors respond by an equal percentage increase in donations as younger donors. Moreover, it is not the case that older donors give more than younger donors, which would be the case if the expected duration of giving were shorter among older donors. Overall, we find no evidence of the response to the GMT treatment differing between age groups.

[29] The lack of significance in the other two groups "young" and "very old" is due to small sample sizes (82 and 283, respectively).