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Now or never! The effect of deadlines on charitable giving: Evidence from two natural field experiments

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Highlights

- We develop a simple model on how deadlines impact donations.
- Two field experiments show empirically the effect of deadlines on donations.
- Deadlines have no effect on the propensity to give.
- A longer deadline increases the amount given, conditional on giving.

ACCEPTED MANUSCRIPT

Now or never! The effect of deadlines on charitable giving: Evidence from two natural field experiments *

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April 20, 2016

Abstract

Do time constraints impact charitable giving? This paper develops a simple model to show how deadlines could affect the propensity to make a charitable donation. We then conduct two field experiments to show empirically the effect of deadlines on charitable giving. About 53,000 prior donors of a large Danish charity received e-mails and text messages with varying deadlines for giving. We find no effect of deadlines on the propensity to give. Instead we observe a “now-or-never” effect; either donations are made immediately or not at all.

Keywords: Field experiment, charitable giving, time preference, deadline, avoiding-the-ask
JEL codes: C93, D03, D64

The smallest deed is better than the greatest intention. John Burroughs

1 Introduction

In the US alone, 316 billion dollars were raised by 1.6 million different charities in 2012 through different fundraising channels (The Giving Institute 2012). In spite of the recent increase in economic research of what works best, there is still an abundance of questions left unanswered when it comes to establishing how to raise money efficiently (see List & Lucking-Reiley (2002), Frey & Meier (2004), Landry et al. (2006) and Falk (2007) among others). In this paper, we contribute to this literature by using two large scale field experiments to study how the presence of external time constraints impacts the effectiveness of fundraising campaigns.

In collaboration with one of the largest Danish charities we contacted their past and current donors with solicitation messages. In the first experiment, donors were contacted by e-mail, and

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in the second experiment, a separate sample of donors were approached by text message. Our sample consists of about 53,000 potential donors who were asked to donate to the charity by a specific date. In both experiments, donors were randomly divided into groups with different deadlines. All groups were offered a fixed 'match' by an anonymous donor on top of their donation. The fixed 'match' was given for every person that donated within the given time period.

In both experiments we impose short, binding deadlines. To guide our expectations about the effects of deadlines we derive two stylized models with deadlines: a standard model of giving (Andreoni 1989, 1990), and a second model also including present-biased preferences (Laibson 1997, O'Donoghue & Rabin 1999, Ericson 2011). In the standard model we show that an individual will donate when his transaction costs are sufficiently low. As transaction costs vary over time, the shorter the deadline, the lower the chance for each individual of drawing transaction costs that are below the donation threshold. Thus, our standard model suggests that longer deadlines lead to more donations because shorter deadlines offer less flexibility. However, when people have time-inconsistent preferences, they tend to procrastinate and overestimate the probability that they will carry out a task in the future. Therefore, some "things are never done not because people have chosen not to do them, but because they have chosen not to do them now" (Tversky & Shafir 1992). Consequently, we extend our model to include present-biased preferences. As in our standard model, a short deadline reduces the probability of drawing a sufficiently low transaction cost within the deadline. Nevertheless, the shorter deadline could also reduce procrastination for individuals, who are unaware of their inconsistent time preferences, as it lowers the likelihood of drawing at least one future transaction cost which is sufficiently low to make it optimal to delay donating. In line with our model, a number of studies suggest that binding deadlines can lead to desired behavior in other contexts such as when handing in homework, when using coupons to pay for goods and services or when filling out a survey for money (Tversky & Shafir 1992, Ariely & Wertenbroch 2002, Shu & Gneezy 2010, McBride et al. 2013, Knowles et al. 2015).

As is standard in the experimental literature on charitable giving we evaluate the outcome on both the extensive margin (the number of donations made) and the intensive margin (the amount donated). Furthermore, we consider the timing of donations. Timing data provides some information about whether people procrastinate giving. An equal distribution of donations over the considered time period would be consistent with the standard model of varying transaction costs. Whereas, a spike in donations just before the end of the deadline would be consistent with a procrastination hypothesis where a binding deadline can help people overcome infinite procrastination problems.

We find a 'now or never' effect - either people donate immediately after being asked or they do not donate at all. This pattern is stable across treatments and in particular arises irrespective of the length of the deadline in both experiments. This is inconsistent with the standard model of varying transaction costs. Knowles & Servtka (2015) conduct a laboratory experiment in which they explicitly vary the transaction costs. They find that while large variations in the transaction costs affects donations, a pure increase in time has no effect, which is consistent with our findings. Furthermore, we do not find any donations right before the end of the deadline either as our model with present-biased preferences would predict and as it is the case in a number of other studies. For example Shu & Gneezy (2010) present evidence that in both aversive and enjoyable cases, individuals procrastinate until right before the deadline. Notably, in both their examples, a pension plan sign up and an art exhibition, it is likely that the participants were reminded

more often to take part right before the deadline due to e-mails and posters. In our experiment, potential donors receive one e-mail and are then not contacted again until some time after the experimental period. It is thus very likely that they procrastinate and subsequently forget about their intention. This combination of delay and inattention that could explain our findings has been studied theoretically by Karlan et al. (2010), Taubinsky (2013) and Calzolari & Nardotto (2014). Like Bertrand et al. (2010) who study the effect of deadlines on demand for loans, we do not find evidence that shorter deadlines can help people overcome problems of procrastination or limited attention and donate earlier.

We find no impact of the length of the deadline on the extensive margin in any of the experiments. This is in line with Knowles et al. (2015) who show that a short deadline does not result in higher responses to their mailing than a one month deadline. We find some evidence that shorter deadlines can move people on the intensive margin towards smaller donations. This finding is related to the work by DellaVigna et al. (2012), who find that social pressure leads to more, but smaller donations.

Our paper contributes to two strands of literature. The paper adds to the literature studying the effect of deadlines (among others Ariely & Wertenbroch (2002) and Bertrand et al. (2010)) and it is related to literature on intertemporal decision making. Most closely to Breman (2011) who also studies intertemporal decision making in the context of charitable giving by giving potential donors the option to commitment to donations in the future. Also, the paper contributes to the vast and growing experimental literature on charitable giving (List & Lucking-Reiley (2002), Landry et al. (2006), Falk (2007) among others).

The rest of the paper proceeds as follows. In section 2, we explain the samples and experimental designs of our two studies. We develop a model of the effect of deadlines on giving in section 3. The results of both experiments are presented in section 4. Section 5 concludes.

2 Samples and Experimental Designs

We worked with Folkekirkens Nødhjælp (Danish Church Aid) to conduct the experiments. The Danish Church Aid is one of the largest Danish NGO's with a total revenue of 0.57 billion in 2013 (Danish Church Aid 2013). The total annual revenue of charities in Denmark is estimated to be in the order of about 2 billion DKK.¹ The beneficiaries of the charity are primarily people in Asia, Africa, the Middle East and Latin America. Donations are tax-deductible for income taxes. The organization solicits donations three to four times a year through different communication channels. Our experiments were part of their annual spring campaign. In the first experiment we contacted a sample of warm-list donors via e-mail and in the second experiment we contacted another sample of warm-list donors using text messages. The e-mail and the text message experiments are separate experiments run on two independent samples of the same subject pool and by the same charity. This gives us independent, but very comparable results. We describe the design of the two experiments in turn.

2.1 The E-Mail Experiment

The sample in the e-mail experiment consists of 20,293 individuals who had donated to the charity at least once in the preceding 6 years and had provided their e-mail address to the

¹Deloitte and the Danish Fundraising Association (ISOBRO) estimate that members of ISOBRO had a combined revenue of 1.8 billion DKK in 2013 and that ISOBRO had a coverage of more than 75% of the market (ISOBRO & Deloitte 2014).

charity for further contact. These individuals received e-mails asking them to donate through a website before some date which varied across treatments.²

We created binding deadlines by offering a fixed 'matching' gift for every person that donated within the deadline. The fixed gift was a conditional commitment by a lead donor to donate a fixed amount for every person that donated within the deadline. The per person gift was paid for by our research funds. We used a matching strategy for two reasons. Our main reason for choosing a matching gift was to create credible and comparable deadlines for the individual treatments. Since the match was only given if donations were received by the announced deadlines, the matching incentives are the same across treatments. For the e-mail group we chose a 'matching' gift of 10 DKK per donation. At the time of the experiment 1 DKK was equal to 0.18 USD. The second reason for using a matching scheme is that matching schemes are known to increase the donation participation rates. This is due to different factors. First, a lead donor who proposes a matching gift increases the credibility of the charity. In our case, this was not an important motivation for using a matching scheme. All addressees had previously donated to the charity, so we can be relatively certain that they perceived the charity as credible. Second, a match decreases the price of giving (Karlan & List 2007). Huck et al. (2013) find that a fixed match above a certain threshold is the most efficient way to use a lead donor gift. We did not state a maximum amount available for the matching gift in order not to discourage participation or suggest that the lead gift might be given anyway and regardless of the number of donations.

In order to test for the effect of shorter vs. longer deadlines, we used much shorter deadlines than the average one month deadline that is common in other studies for example by Karlan et al. (2011), List & Lucking-Reiley (2002) or Huck & Rasul (2011). Huck & Rasul (2011) note the four week deadline might affect behavior, but show that 97% of potential donors who donate do so within the four week time frame and that the median donor did so within the first week.³ Furthermore, they find no differences in behavior between non-matching treatments with no mention of a deadline and treatments with the four week deadline. This suggests that the four week deadline is non-binding. We used a 34 day deadline as our control because we wanted at least a one-month deadline in the control treatment to make it non-binding. In addition, for technical reasons we wanted to avoid having the deadline on a weekend and we preferred to have the deadline on a focal date such as the 1st of a month.

In the e-mail experiment we had the following treatments: Short Deadline (SD), Medium Deadline (MD) and Long Deadline, i.e. Control group (C) (see Table 1).⁴ We chose the short deadline to be three days. In a preliminary survey among university students, we found that most students read their e-mail on the same day. However, since we had a heterogeneous sample with an average age of 45 (see Table 2), some people in the sample might not open their e-mails as frequently as students so we wanted the deadline to be long enough to give the majority of the group a chance to open their e-mail. Also, data from the Online Giving study shows that most online giving is done during the week, with the lowest activity on weekends (MacLaughlin et al. 2012). We decided that 72 hours during the week, with the e-mail sent off on a Tuesday should thus cover most of the people we wanted to reach. The medium deadline was one week longer than the short deadline, i.e. 10 days, implying that the short and medium deadlines were on the same day of the week. We chose this to reduce 'day of the week' effects in comparisons between the short and medium deadlines.

²In total we contacted 20,375 past donors by e-mail. We excluded 1 observation because the necessary identifier was lacking and we dropped 81 observations due to a technical error which led to double treatment of these donors.

³This result was later replicated by Knowles et al. (2015) who find that 97% of the donors in their no deadline treatment, donate within the first month.

⁴In parallel to these treatments we ran a fourth treatment which is discussed in Damgaard & Gravert (2015).

Table 1: Treatment deadlines

	2 days	3 days	10 days	34 days
E-Mail		SD	MD	C
Text Message	TSD	TMD		TC

Notes: The table summarizes the treatment deadlines in the two experiments. In the e-mail experiment the treatments were: Short Deadline (SD), Medium Deadline (MD) and Control group (C). In the text message experiment the treatments were: Short Deadline (TSD), Medium Deadline (TMD) and Control group (TC).

We decided to run the campaign in late spring in order to be free of exogenous deadlines such as Christmas and the end of the tax year, which could interact with our matching deadlines. The e-mails were sent out on the 28th of May 2013 with the last deadline on the 1st of July 2013.

The e-mail addresses were randomized by a random number generator into two approximately equal sized groups plus a smaller control group (42.5%/42.5%/15%). All three groups received the same e-mail subject line without mentioning the deadline to prevent any selection before opening the e-mail. The subject line 'Lokwang grills rats' referred to the story told in the main body of the e-mail. The money raised was for children like Lokwang who often go weeks without food and have to resort to hunting and eating rats in order to survive. The story was written by the charity and was in accordance with their usual solicitations.

Once the receivers opened the e-mail the main header announced the respective deadline to make sure that the individual got treated, i.e. saw the deadline: 'Donate before X'. In addition to the story about Lokwang, the main body of the e-mail asked the individual to donate. There was also a picture of Lokwang and a button to the donation website. The first paragraph of the e-mail explained the matching grant followed by an example of how the matching grant worked (Figure A1 in Appendix). The receivers were made aware of the fact that their donation was tax deductible. At the bottom of the e-mail there was a standard e-mail signature by the charity and an option to unsubscribe from the e-mail service. We tried to keep the design as basic as possible in order not to distract from the treatment. Once a person clicked on the button to make a donation he was redirected to a donation website where he could fill out his personal information and decide on his donation amount. The donation websites depended on the treatment and again displayed the deadline. The minimum donation that could be made was 50 DKK, which is the usual restriction by the charity for online donations, but the amount was not restricted from above. After donating the donor was redirected to an information page where he could learn more about the charity's projects.

Measuring the treatment effect on the treated is difficult with letters, e-mails and text messages. The advantage of e-mails over letters is that we have a rough estimate of whether an e-mail has been opened. Whenever the e-mail program downloads a picture from the server or if a person clicks on a link in the e-mail, we count the e-mail as opened. Our study is one of the first to provide an estimate on how many e-mails are actually read. This provides us with a rough approximation of the treated. As some e-mail programs block automatic downloads, our count is downward biased. However, it provides a good reference point for future power calculations of field experiments with e-mail solicitation.

We have information on gender, age, and urban vs. rural for a subsample of the individuals. Table 2, column 1, presents the sample characteristics of the e-mail sample. The average age is

45, about a third of the sample lives in urban areas, and roughly two thirds of the sample are women. The sample characteristics are balanced across the treatment and control groups. This balance was achieved through the randomization.

Table 2: Summary Statistics and Covariates Balance

	E-Mail				Text Messages			
	All	Short	Medium	Control	All	Short	Medium	Control
Female	0.62 (0.48)	0.62 (0.48)	0.62 (0.49)	0.63 (0.48)	0.62 (0.49)	0.65 (0.48)	0.61 (0.49)	0.59 (0.49)
Age	45 (15)	45 (15)	45 (15)	45 (15)	43 (15)	45 (16)	42 (14)	46 (15)
Urban	0.34 (0.47)	0.34 (0.47)	0.33 (0.47)	0.34 (0.47)	- -	- -	- -	- -
Amount donated last time (DKK)	317 (605)	309 (552)	325 (669)	317 (546)	376 (782)	386 (784)	358 (698)	407 (1079)
Years since last donation	2.85 (1.60)	2.84 (1.60)	2.87 (1.59)	2.83 (1.59)	3.14 (2.11)	3.17 (2.13)	3.08 (2.09)	3.22 (2.14)
Observations	20,293	8,709	8,692	2,892	32,996	14,837	14,862	3,297

Notes: The table reports means and standard deviations (in brackets). The urban indicator was created from zip codes by making a dummy for the 10 biggest cities in Denmark. In the e-mail sample we have information on urban for 99 percent, on gender for 78 percent, on age for 39 percent and on the most recent donation for 89 percent. For the text message sample we have information on gender for 26 percent of the sample and age for 25 percent. We have information on the most recent donation for 16 percent of the text message sample.

2.2 Text Message Experiment

The text message sample consisted of 32,996 individuals who had previously provided mobile numbers to the charity. This group received text messages with the option to donate a fixed amount by sending a text message to the charity by a given date which varied across treatments.⁵

The design of the text message experiment mirrors the design of the e-mail experiment rather closely, but there are some differences between the communication channels. As in the e-mail experiment we use a per donation ‘matching’ gift to create a credible deadline. In the text message group the gift is 5 DKK per donation made by the specified deadline. This is lower than in the e-mail experiment because we knew that donations would be smaller in the text message experiment due to different restrictions on the amount imposed by the design.

The deadlines in the text message experiment were more immediate than in the e-mail experiment. The experiment had the following treatment and control groups: Short Deadline (TSD), Medium Deadline (TMD) and Control group (TC). The short deadline was at midnight on the day after the message was sent. From our survey among university students, we knew that most students read their text messages immediately. So we could be fairly certain that the majority of recipients would have read the text message before the short deadline. The medium deadline was three days and the control group received a 34 day deadline as in the e-mail experiment. The text messages were sent on the 18th of June 2013 with the last deadline on the 22nd of July 2013.

⁵Text messages were sent to a total of 33,621 individuals. We had to exclude 7 observations because the donors were less than 18 years old. Another 59 observations were excluded due to double treatment. The remaining missing observations are messages sent to land-line numbers, which in Denmark are hard to distinguish from mobile numbers.

Mobile numbers were randomized into two approximately equal sized groups and a smaller control group (45%/45%/10%). The addressees received a text message asking them to donate before the deadline and informing them of the match (see Figure A2 in Appendix). They could donate 25 DKK by texting 'Giv25' to the charity's phone number. As is common practice for text message donations, the amount was fixed to one amount due to technical constraints. In order not to discourage participation, we fixed a relatively low amount. The text message also informed receivers of the possibility to unsubscribe from future text message communication. We assume that everyone who received the text message also opened it. Market studies have estimated the opening rate of text messages to be around 98 percent (Frost & Sullivan 2010).

We have information on gender and age for a subsample of the individuals in the text message experiment. Column 5 in Table 2 presents the sample characteristics which are very similar to those of the e-mail sample and as in the e-mail experiment, sample characteristics are balanced across the treatment and control groups.

3 Theoretical Framework

Next we develop a simple model of a donation problem for an individual ("the donor") to illustrate the effect of deadlines on donation decisions. We then extend this standard model, in which the donor fully and correctly anticipates the future, with present-biased preferences of a naive donor (Laibson 1997, O'Donoghue & Rabin 1999) to show the impact of procrastination on the donation decision.⁶

3.1 The setup

Our model is based on the model of impure altruism by Andreoni (1989) and Andreoni (1990) with the addition of transaction/opportunity costs of giving in the spirit of Huck & Rasul (2010).

For simplicity, we consider the case where the donor must choose whether or not to donate a pre-specified amount $\hat{g}$ and assume that he can at most donate to the charity once.⁷

Suppose that donor i 's period t utility can be decomposed into four additive terms. A consumption utility term $u(x_{it}) = u(W - g_{it})$ where $g_{it} \in \{0, \hat{g}\}$ denotes giving in period t and W denotes the normal per-period level of consumption, which for simplicity is taken to be non-stochastic and constant. A warm-glow utility term $v(g_{it})$ which represents utility derived from the act of giving. An altruism term $a(G)$ which represents the utility the donor derives from seeing or knowing that the charity's beneficiaries get a higher utility. The final term is a transaction cost term:

$$c(g_{it}) = \begin{cases} c_t & \text{if } g_{it} = \hat{g} \\ 0 & \text{if } g_{it} = 0 \end{cases}$$

where c_t is identically and independently distributed with a distribution function $F(c_t)$. For simplicity, we assume that the donor knows all future draws with certainty and can order them in terms of size. We use $t^{(1)}$ to denote the time period associated with the smallest transaction cost, i.e. $c_{t^{(1)}} = \min_t(c_t)$, $t^{(2)}$ to denote the time period associated with the second smallest transaction cost, i.e. $c_{t^{(2)}} = \min_{t \neq t^{(1)}}(c_t)$, and so on.

We assume that the donor receives a fundraising appeal at time $t = 1$ and that the donor can make his donation in any one of the time periods $t = 1, 2, \dots$. For the sake of presentation,

⁶Technical details are deferred to the technical appendix available on request from the authors.

⁷These assumptions make the model similar to our experimental setting in the text message experiment. The match was added per person who donated within a certain time and the amount was pre-specified.

we normalize the discount factor to unity, $\delta = 1$. Consumption utility, warm-glow utility and transaction costs occur immediately, but we assume that the altruistic utility materializes in the future as the charity puts the money to use and the standard of living of the beneficiaries is improved. The assumptions regarding the timing of warm-glow and altruistic utility are similar to the assumptions in Breman (2011).

3.2 Standard model

The inter-temporal utility for individual i of making the donation at time t is given by:

$$U(\hat{g}, c_t) = u(W - \hat{g}) + v(\hat{g}) - c_t + a(G_{-i} + \hat{g}) + \sum_{k \neq t} u(W)$$

The corresponding utility of never making a donation is $U(0, 0) = \sum_t u(W) + a(G_{-i})$. The inter-temporal utility function above is maximized when c_t is minimized, so it follows that if the donor makes a donation he makes it at time $t = t^{(1)}$. The donor makes a donation at time $t = t^{(1)}$ if the benefits of donating are greater than the costs of donating at time $t^{(1)}$, or more formally if $c_{t^{(1)}} \leq \bar{c}$ where $\bar{c}$ is the transaction cost that equates the benefits and costs of donating. This implies that in our standard model, the donor gives straight away if transaction costs are minimized in the first period (period $t = 1$) while the donor rationally delays donating when transaction costs are minimized in a later period such that $t^{(1)} > 1$.

Under the assumption that transaction costs are identically and independently distributed across time and individuals, our standard model predicts that donations are equally distributed across time in the population.

3.3 $\beta\delta$ -model

Now suppose that the donor has present-biased preferences which can be represented by $\beta\delta$ -preferences. This creates a wedge between current and future utility and makes it necessary to distinguish between the utility of current and future selves. Recall that we have normalized $\delta = 1$ and assume that $\beta \leq 1$ is the weight put on future utility by the current self. However, in all periods the naive donor thinks that in the future he will not have a self-control problem ($\beta = 1$).

3.3.1 Optimal choice from date-0 perspective (Self 0)

From Self 0's point of view all costs and benefits of donating are in the future, so Self 0 would maximize:

$$U_0(\hat{g}, c_t) = \beta \left[u(W - \hat{g}) + v(\hat{g}) - c_t + a(G_{-i} + \hat{g}) + \sum_{k \neq t} u(w) \right]$$

which is equivalent to maximizing equation (3.2) in the standard model. Self 0 would thus choose to make a donation at time $t = t^{(1)}$ such that $c_{t^{(1)}} = \min_t(c_t)$ if and only if $c_{t^{(1)}} \leq \bar{c}$. Hence, the threshold transaction cost below which donating is optimal is identical to the standard model.

3.3.2 Optimal choice from date-1 perspective (Self 1)

For Self $t > 0$ the utility depends crucially on whether the donation is made now (at time t) or in a future period. Consider the choice of Self 1. His utility from making the donation at time $t = 1$ is:

$$U_1(\hat{g}, c_1) = u(W - \hat{g}) + v(\hat{g}) - c_1 + \beta \left(a(G_{-i} + \hat{g}) + \sum_{k>1} u(w) \right) \quad (1)$$

Self 1's utility from never donating is $U_1(0, 0) = u(W) + \beta \sum_{k>1} u(w) + \beta a(G_{-i})$. As in the standard model, it follows that Self 1 prefers donating now (at time $t = 1$) to never donating if transaction costs are below a certain threshold. Formally, Self 1 prefers donating now to never if $c_1 \leq \bar{c}$ and it can be shown that $\bar{c} \leq \bar{\bar{c}}$. The transaction cost threshold under which Self 1 prefers to donate now versus never is lower than the threshold of Self 0 because the costs of giving occur in the current period for Self 1 and therefore are not discounted, while some of the benefits occur in the future and are discounted. Consequently, there should be fewer donations if donors have $\beta\delta$ -preferences than if they have standard preferences.

This conflict between current and future selves may also lead to procrastination problems. Self 1's utility from donating in a future period $t > 1$ is:

$$U_1(\hat{g}, c_t) = u(W) + \beta \left(u(W - \hat{g}) + v(\hat{g}) - c_t + a(G_{-i} + \hat{g}) + \sum_{k>1, k \neq t} u(w) \right)$$

Comparing this to the utility in (1), it can be shown that for a given c_t , Self 1 prefers delaying the donation to a future period $t > 1$ if $c_1 \geq c_F(c_t)$ where $c_F(c_t)$ is a threshold value that depends c_t . It follows that when the donor reaches the period with the lowest transaction costs, procrastination can occur if transaction costs in at least one future period are sufficiently low that the current self thinks that his future self will prefer donating to never donating. Finally note that if $c_1 < c_F(c_2)$ Self 1 prefers donating now to waiting. This may for example happen if the warm-glow utility from donating is very large because warm-glow is felt at the time of the donation and feelings of warm-glow can therefore alleviate potential self-control problems.

3.4 The effect of deadlines

Suppose that the fundraising appeal sent to donors at time $t = 1$ includes a binding deadline d as in our experiment.⁸ We now show how altering the length of d , as done in our experimental treatments, affects the donation decision.

3.4.1 Deadlines in the standard model

Recall that in our standard model the donor prefers making a donation at time t to never making a donation if $c_t \leq \bar{c}$. Let $p = 1 - F(\bar{c})$ denote the probability that transaction costs in any given period are so high that the donor prefers never making a donation to making a donation in that period. Then p^d is the probability that d independent draws from the distribution are all too high and $1 - p^d$ is the probability that transaction costs are sufficiently low at least in one period within the d period deadline. It follows that $\lim_{d \rightarrow \infty} p^d = 0$. The longer the deadline the lower the probability that there will be no period within the deadline where transaction costs are sufficiently low. Hence, according to our standard model, a longer deadline should lead to more donations.

⁸It is possible to donate after the deadline, but the match amount is lost, thus reducing the utility of donating.

3.4.2 Deadlines in the $\beta\delta$ -model

By similar reasoning as in our standard model a longer deadline makes it more likely that transaction costs are sufficiently low at some point in time to make giving optimal. However, at the same time a longer deadline also makes procrastination more likely. A shorter deadline could therefore reduce procrastination problems but as in our standard model, a very short deadline could also make it less likely that a donation is made.

Our $\beta\delta$ -model with a deadline makes very different predictions about the timing of donations than our standard model. Recall that in our standard model, donations are predicted to be evenly distributed across time in the population. In contrast, when procrastination occurs, $\beta\delta$ -model predicts an uneven distribution of donations across time with a spike in donations just before the deadline. In the last period, the individual faces the choice between donating now or never donating. Since we have assumed that $c < \bar{c}$, he donates in period d . Hence, we would expect to see a spike in donations just prior to the deadline. This is the same prediction as in the classic $\beta\delta$ -model by O'Donoghue & Rabin (1999).

4 Experimental Results

Figure 1 and Table 3 give an overview over the core experimental results for both experiments. We discuss the results of the e-mail and text message experiments in turn.

4.1 E-Mail Experiment Results

The e-mail experiment suffers from a low response rate of 0.4 percent (68 donations). This indicates that while easy and relatively inexpensive to implement, e-mail solicitations may not be very effective in terms of raising money. The low response rate is, however, in line with statistics from market studies on e-mail mailings. When we condition on whether the e-mails were opened, our average response rate is 1.3 percent. In total we raised 13,750 DKK with the e-mail campaign.

Notes: E-Mail Experiment: Testing the differences in the response rate using a one-sided non-parametric Chi2 test in order to compare the short and the medium deadline to the control group (p-value = 0.37 and 0.37, respectively) and the short and the medium deadline treatments to each other (p-value = 0.55) we find no statistically significant effect of the deadlines by themselves. Text Message Experiment: Although the response rates are slightly higher for the short deadlines than the long control deadline, the differences between the two short treatments and the control treatment are not statistically different (Chi2-test, p-value = 0.15 and 0.13).

Table 3: E-mail and Text Message: Results Statistics

	E-Mail				Text Messages			
	All	Short	Medium	Control	All	Short	Medium	Control
Full sample								
Donated (response rate)	0.004 (0.06)	0.003 (0.06)	0.003 (0.06)	0.003 (0.05)	0.038 (0.19)	0.038 (0.19)	0.038 (0.19)	0.034 (0.18)
Donated by deadline	0.90 (0.30)	0.90 (0.31)	1 (-)	1 (-)	0.96 (0.20)	0.94 (0.24)	0.97 (0.17)	1 (-)
Amount donated (DKK)	0.79 (20)	0.58 (15)	0.63 (19)	1.12 (26)	0.94 (4.8)	0.95 (4.8)	0.96 (4.8)	0.84 (4.5)
Amount conditional on donating (DKK)	201 (245)	168 (196)	182 (274)	406 (317)	25 (-)	25 (-)	25 (-)	25 (-)
Opened sample								
Donated	0.013 (0.11)	0.012 (0.11)	0.012 (0.11)	0.010 (0.10)				
Amount donated (DKK)	2.55 (36)	2.10 (28)	2.09 (35)	4.04 (50)				
Amount conditional on donating (DKK)	201 (245)	168 (196)	182 (274)	406 (317)				
Observations								
Full sample	20,293	8,709	8,692	2,892	32,996	14,837	14,862	3,297
Opened sample	5,135	2,410	2,603	804				
Total number of donors	68	30	30	8	1,243	562	569	112
Total amount raised								
Amount donated (DKK)	13,750	5,050	5,450	3,250	31,075	14,050	14,225	2,800
Amount donated + match (DKK)	14,400	5,320	5,750	3,330	37,290	16,860	17,070	3,360

Notes: The table provides means and standard deviations (in brackets) for the full samples and the sample of opened e-mails. We define an e-mail as opened if the e-mail program downloaded a picture from the server or if a person clicked on a link in the e-mail. Hence if a person made a donation, the e-mail was by definition counted as opened. The table also provides information about the total number of observations in each sample, the total number of donations and the amount raised by the experiments with and without the matching gift. One donor donated twice in response to the solicitation. We only include the first donation in the table means.

4.1.1 Response rates and time patterns

In the e-mail experiment, we do not find support for the hypothesis that deadlines can move people on the extensive margin. Our interest is specifically in the hypothesis that shorter deadlines could help individuals overcome problems associated with time-inconsistent preferences. Higher response rates in short deadline treatments would be consistent with this hypothesis. Contrary, higher response rates in the long deadline treatment would be consistent with the standard model. The left side of Figure 1 shows the donation rates of the three treatment groups. We find that the control group has a slightly lower response rate, but the differences are not statistically significant. The results are the same in the regression analysis using a probit model on the probability to donate. Column 1, Table 4 shows the results for the short and medium treatment compared to the control group. In column 2 we add our control variables. The treatment difference stays the same, but we find a tiny significant positive effect of age on the propensity to give. Older receivers are slightly more likely to give. Based on the propensity to donate, we do not find any support for either of our model predictions.

A closer look at the time pattern for donations reveals that donation behavior is remarkably similar across treatments. Figure 2 shows the timing of all donations made in the e-mail experiment by treatment. Irrespective of treatment, most donations were made on the day the e-mails were sent out. Hence, we find a 'now or never' donation behavior for all three deadlines. People in the medium or control treatments do not appear to make use of the option to donate later and we observe no spike in donations around the time of the deadlines. Thus, our findings seem to be more in line with delay and inattention theory, which predicts that individuals forget about donating when they are not reminded (Karlan et al. 2010, Taubinsky 2013, Calzolari & Nardotto 2014) rather than with our standard model or with the model with present-biased preferences without inattention (Laibson 1997, O'Donoghue & Rabin 1999). The results can also be explained if there is a high variation in warm-glow between the individuals. Individuals with very high warm-glow utility might donate in the first period irrespective of any variation in transaction costs in order to experience the warm-glow immediately.

Notes: The first vertical line marks the three day deadline, the second marks the ten day deadline and the last marks the 34 day deadline.

4.1.2 Amount donated

We find some evidence that deadlines can move people on the intensive margin. The average donated amount is lowest in the short deadline treatment and highest in the control treatment. This also holds if we compare conditional means i.e. the average donations conditional on having donated. It should be noted that it is less straight forward to compare across treatments when

Table 4: E-mail: Likelihood of donating and amount donated

	Donated		Amount Donated	
	(1)	(2)	(3)	(4)
3 Day Deadline	0.00074 (0.00135)	0.00072 (0.00146)	-400.00000*** (65.76096)	-395.17110*** (47.58827)
10 Day Deadline	0.00075 (0.00135)	0.00132 (0.00149)	-400.00000*** (65.76096)	-394.43580*** (46.95574)
Female		0.00075 (0.00086)		-50.00000 (29.97718)
Age 40-59		0.00007*** (0.00002)		0.99689 (0.65144)
Age 60+		0.00009*** (0.00002)		0.73529 (0.50435)
Urban		0.00166 (0.00106)		0.41714 (28.93211)
Observations	20,293	15,664	68	63
Pseudo R^2	0.000	0.039		

Regression 1 and 2: Probit - Marginal Effects, Dep. variable: Donated; Regression 3 and 4: Median Regression to control for outliers, Dep. variable: Amount donated conditional on donating. The omitted categories are: 34 day deadline, male, age 18-39 and rural. Significance values * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

we condition on having donated because there is no longer random assignment to the groups. However, a median regression (in order to reduce the impact of outliers) on the size of donations conditional on giving replicates the finding that the amount given is larger in the control group than in any of the treatments (see Table 4 columns 3 and 4). Donors in the short and medium deadline gave on average 400 DKK less than donors in the long deadline. This effect is mostly driven by a lower number of small donations in the long deadline, see Figure 3. Moreover, this effect is robust to the inclusion of control variables, which are all insignificant. Hence, there is some evidence that people who face shorter deadlines donate less. This finding is in line with the social pressure hypothesis by DellaVigna et al. (2012). In a door-to-door solicitation experiment they find that individuals, who feel pressured to give due to social pressure created by the direct ask, rather give small amounts than not give at all. Arguably, the social pressure is less strong in an e-mail solicitation than in a door to door fund-raiser, but the short deadline and implied time pressure could trigger a similar response in some individuals. In DellaVigna et al. (2012) individuals are also asked to make a donation decision under time pressure - while the solicitor is standing in front of their door. In their comparison treatment individuals knew that the solicitor would approach their house the next day. This knowledge gave them the possibility to opt out, but also more time to think about the amount they want to donate. It is important to consider that no matter the length of the deadline nearly all donors give on the first or second day, so the reaction seems to be triggered by the *perception* of time pressure, not *actual* time pressure.

Figure 3: E-mail Experiment: Donation Amounts

Notes: Using a Wilcoxon rank-sum test we do not find that distributions of the unconditional donation amount are significantly different (Short vs. Control: p-value=0.58; Medium vs. Control: p-value=0.56). However, we do find significant differences between the distribution of the donated amount in the long deadline and the short and medium treatments when we condition on giving (p-values = 0.04, in both comparisons).

4.2 Text Message Experiment Results

In our text message experiment, we find a much higher response rate than in the e-mail sample of on average 3.8 percent (1,243 donations). In the text message experiment, we raised 31,075 DKK. This provides evidence that soliciting via text message could be a more successful channel than e-mail.

4.2.1 Response rates and time patterns

Evidence from the text message experiment also does not support the hypothesis that shorter deadlines lead to more donations (see Figure 1, right hand side). The response rate for the short and medium deadlines are practically identical. These results are confirmed in a probit

Figure 4: Text Message: Timing of Donation

Notes: The first vertical line marks the two day deadline, the second marks the three day deadline and the last marks the 34 day deadline. Time of donation is only available for a random 1/3 of the text message sample.

regression on the response rate, Table 5, column 1. The regression yields an insignificant increase in likelihood of donating of 0.4 to 0.45 percentage points in the short and medium deadlines compared to the control group. When we add controls the effect becomes bigger, but in the case of the medium deadline it becomes negative. Being older and living in the city has a significant negative effect of 0.1-0.2 percentage points and 1.9 percentage points, respectively. This age effect could be explained by the fact that older people are less familiar with using a phone to make monetary transactions. This is in line with the age effect being positive although not significant in the e-mail experiment. Generally, older people are more likely to use traditional channels of donating.

As in the e-mail experiment, we find evidence of a 'now or never' behavior. Only 11 percent of the donations in the text message control treatment are made after the first three days and none in the two weeks immediately before the long deadline (see Figure 4.2.1).

Since the donation amount for the text message experiment was set by us at 25 DKK, there is no variation in the amount donated.

Table 5: Text Message: Likelihood of donating

	Donated	
	(1)	(2)
1 Day Deadline	0.00408 (0.00381)	0.02524 (0.07313)
3 Day Deadline	0.00449 (0.00381)	-0.02759 (0.07386)
Age 40-59		-0.00223*** (0.00014)
Age 60+		-0.00111*** (0.00012)
Urban		-0.01922*** (0.00387)
Observations	32,996	13,691
R^2		
Pseudo R^2	0.000	0.069

Regression 1 and 2: Probit - Marginal Effects, Dep. variable: Donated; The omitted categories are: 34 day deadline, age 18-39 and rural. Due to a low number of observations, it is not possible to include gender in the regression. Significance values * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

5 Discussion and Conclusion

We estimate the effects of deadlines on charitable giving using two large scale natural field experiments. Results are reported for e-mails and text messages sent to about 53,000 Danish residents asking them to donate to a large Danish charity. In order to create binding deadlines and increase giving, we utilized a fixed match amount per person who donated. Furthermore, we model the effect of deadlines on donations theoretically in a standard neoclassical setting with varying transaction costs and in a setting with a naive individual with present-biased preferences. Our standard model predicts donations equally distributed over time, while our model with present-biased preferences predicts a spike in donations right before the deadlines. However, we do not find a significant effect of the deadlines on giving. Most donations are made within the first two to three days no matter how long the deadline is. In both experiments later donations are negligible. We call this 'now or never' behavior. Thus, neither model is able to correctly predict behavior in the experiment. The results are more in line with delay and inattention theory by Karlan et al. (2010), Taubinsky (2013), Calzolari & Nardotto (2014), who predict that individuals procrastinate and subsequently forget about their intention to give when they are not reminded, as is the case in our experiments. Additionally, we find that longer deadlines lead to slightly larger average donations, which comes from a lower amount of small donations. This finding is in line with social pressure costs of giving as first discussed by DellaVigna et al. (2012). Although we observe no donations after the 34 day period, one could argue that an even longer time to donate could affect behavior differently. Inspired by the first version of our paper (Damgaard & Grauert 2014) Knowles et al. (2015) add a treatment in which they do not set a deadline and find a higher response rate than with a deadline. Their finding is in contradiction to a later experiment by Zamir et al. (2015) who find an increase of responses with a deadline compared to no deadline in a class evaluation. This contrast in results could be an indication for the fact that not specifying a deadline could send different signals to the receiver than setting a deadline, such as perceived pushiness of the sender or urgency of the action. The responses to a deadline versus to no deadline are thus not directly comparable, but provide an addition to our understanding of how time constraints impact charitable giving.

Overall, our findings will be useful for theorists and empiricists by contributing to the literature on charitable giving through exploring new methods of solicitation and giving insight into time preferences when making donation decisions. For charitable organizations our results lead to the practical conclusion that the length of the deadline does not affect the number of donations, while there is some evidence that time pressure can lead to smaller donations. To reduce this perceived time pressure charities can give a longer deadline, but should not expect any further donations after the first two to three days.

References

- 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', *Economic Journal* **199**(401), 464–477.
- Ariely, D. & Wertenbroch, K. (2002), 'Procastination, deadlines, and performance', *Psychological Science* **13**(3), 219–224.
- Bertrand, M., Karlan, D., Mullainathan, S., Shafir, E. & Zinman, J. (2010), 'What's advertising content worth? evidence from a consumer credit marketing field experiment', *The Quarterly Journal of Economics* **125**(1), 263–306.
- Breman, A. (2011), 'Give more tomorrow: Two field experiments on altruism and intertemporal choice', *Journal of Public Economics* **95**, 1349–1357.
- Calzolari, G. & Nardotto, M. (2014), Nudging with information: A randomized field experiment. Working paper.
- Damgaard, M. T. & Gravert, C. (2014), 'Now or never! the effect of deadlines on charitable giving', *Aarhus University Economics Working Paper* **2014-03**.
- Damgaard, M. T. & Gravert, C. (2015), 'The hidden costs of nudging: Experimental evidence from reminders in fundraising', *Unpublished Manuscript*.
- Danish Church Aid (2013), 'årsrapport folkekirkens nødhjælp 2013'.
- DellaVigna, S., List, J. A. & Malmendier, U. (2012), 'Testing for altruism and social pressure in charitable giving', *Quarterly Journal of Economics* **127**(1), 1–56.
- Ericson, K. M. M. (2011), 'Forgetting we forget: Overconfidence and memory', *Journal of the European Economic Association* **9**(1), 43–60.
- Falk, A. (2007), 'Gift-exchange in the field', *Econometrica* **75**, 1510–1512.
- Frey, B. S. & Meier, S. (2004), 'Social comparisons and pro-social behavior: Testing 'conditional cooperation' in a field experiment', *American Economic Review* **94**, 1717–1722.
- Frost & Sullivan (2010), 'North american consumer mobile communications outlook'.
- Huck, S. & Rasul, I. (2010), 'Transaction costs in charitable giving', *The B.E. Journal of Economic Analysis & Policy* **10**(1), Article 31.
- Huck, S. & Rasul, I. (2011), 'Matched fundraising: Evidence from a natural field experiment', *Journal of Public Economics* **95**, 351–362.
- Huck, S., Rasul, I. & Shephard, A. (2013), 'Comparing charitable fundraising schemes: Evidence from a natural field experiment and a structural model', *Discussion Paper, Wissenschaftszentrum Berlin fuer Sozialforschung, Abteilung Oekonomik des Wandels: Schwerpunkt Maerkte und Politik*, **No. SP II 2012-303r**.
- ISOBRO & Deloitte (2014), 'Isobro og deloitte's analyse af udviklingen i de danske indsamlingssorganisationers indtægter mv. i perioden 2009 - 2013'.

- Karlan, D. & List, J. A. (2007), 'Does price matter in charitable giving? evidence from a large-scale natural field experiment', *American Economic Review* **97**, 1774–1793.
- Karlan, D., List, J. A. & Shafir, E. (2011), 'Small matches and charitable giving: Evidence from a natural field experiment', *Journal of Public Economics* **95**, 344–350.
- Karlan, D., McConnell, M., Mullainathan, S. & Zinman, J. (2010), Getting to the top of mind: How reminders increase saving, Technical report, National Bureau of Economic Research.
- Knowles, S. & Servtka, M. (2015), 'Transaction costs, the opportunity cost of time and procrastination in charitable giving', *Journal of Public Economics* **125**, 54 – 63.
- Knowles, S., Servtka, M. & Sullivan, T. (2015), Deadlines, Procrastination, and Inattention in Charitable Giving: A Field Experiment, Working Papers in Economics 15/06, University of Canterbury, Department of Economics and Finance.
- Laibson, D. (1997), 'Golden eggs and hyperbolic discounting', *Quarterly Journal of Economics* **112**(2), 443–477.
- Landry, C. E., Lange, A., List, J. A., Price, M. K. & Rupp, N. G. (2006), 'Toward and understanding of the economics of charity: Evidence from a natural field experiment', *Quarterly Journal of Economics* **121**, 742–782.
- List, J. A. & Lucking-Reiley, D. (2002), 'Effects of seed money and refunds on charitable giving: Experimental evidence from a university capital campaign', *Journal of Political Economy* **110**, 215–233.
- MacLaughlin, S., O'Shaughnessy, J. & Diest, A. V. (2012), 'The 2011 online giving report', *Blackbaud*.
- McBride, D. M., Coane, J. H., Drwal, J. & LaRose, S.-A. M. (2013), 'Differential effects of delay on time-based prospective memory in younger and older adults', *Aging, Neuropsychology, and Cognition* **20**(6), 700–721.
- O'Donoghue, T. & Rabin, M. (1999), 'Doing it now or later', *American Economic Review* **98**, 103–124.
- Shu, S. B. & Gneezy, A. (2010), 'Procastination of enjoyable experiences', *Journal of Marketing Research* **47**, 933–944.
- Taubinsky, D. (2013), 'From intentions to actions: A model and experimental evidence of inattentive choice', *working paper*.
- The Giving Institute (2012), Giving USA 2013 report, Technical report.
- Tversky, A. & Shafir, E. (1992), 'Choice under conflict: The dynamics of deferred decisions', *Psychological Science* **3**(6), 358–361.
- Zamir, E., Lewinsohn-Zamir, D. & Ritov, I. (2015), 'It's now or never! using deadlines as nudges', *Law and Social Inquiry* **Forthcoming**.

A Figures

Figure A1: Screenshot of one of the e-mails

Text Message Content

XXX needs your donation to support the world's poorest. A collaborator will give 5kr for every person that gives to XXX until DEADLINE. Give before DEADLINE and make an impact. Send GIV25 to XXX to donate 25kr. To unsubscribe: STOP to XXX.

Figure A2: Content of text message