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The hidden costs of nudging: Experimental evidence from reminders in fundraising[☆]

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ABSTRACT

We document the hidden costs of a popular nudge and show how these costs distort policy making when neglected. In a field experiment with a charity, we find reminders increasing intended behavior (donations), but also increasing avoidance behavior (unsubscriptions from the mailing list). We develop a dynamic model of donation and unsubscription behavior with limited attention. We test the model in a second field experiment which also provides evidence that the hidden costs are anticipated. The model is estimated structurally to perform a welfare analysis. Not accounting for hidden costs overstates the welfare effects for donors by factor ten and hides potential negative welfare effects of the charity.

1. Introduction

"Nudging" policies have gained increased attention from practitioners and academics. Nudges are small deliberate changes to the decision environment designed to increase privately and socially beneficial behavior such as healthy habits, increased saving, sustainable consumption or charitable giving without adjusting prices or restricting choice. With the establishment of governmental behavioral units like in the UK, the US and Denmark behavioral interventions are becoming part of the policy toolkit.

The success of a nudge is usually evaluated by the positive behavior change it induces. Moreover, their low implementation costs create a high cost-benefit ratio. However, evaluating the success of a nudge on the magnitude of behavioral change and implementation cost alone could be misleading from a social welfare perspective (see Carroll et al., 2009; Handel, 2013; Allcott and Kessler, 2015; Bernheim et al., 2015; Bhattacharya et al., 2015; Chesterley, 2015; Murooka and Schwarz, 2016 for related arguments).

This paper investigates the cumulative welfare effects of nudges and shows that nudges might be less innocuous than generally assumed. We apply our approach to a well-known nudge: reminders.

Reminders are designed to curb forgetfulness by bringing a particular decision or task to recipients' attention and induce behavioral change. A large number of recent papers have shown that reminders can influence behavior in the context of gym attendance (Calzolari and Nardotto, 2017), adherence to medical treatments (Vervloet et al., 2012; Altmann and Traxler, 2014), personal savings (Karlan et al., 2016), take-up of social benefits (Bhargava and Manoli, 2015), electricity consumption (Allcott and Rogers, 2014; Gilbert and Zivin, 2014), and giving to charitable organizations (Huck and Rasul, 2010; Sonntag and Zizzo, 2015).

Technological improvements over the past few decades have led to low implementation costs of reminders, implying that reminders will become even more common. This makes it relevant to explore potential indirect or non-pecuniary costs, i.e. "hidden cost of nudging", of reminders for the recipients or the senders. We examine the aggregate reminder effect in the context of charitable giving. The hidden costs are identified from a revealed preference measure: unsubscribing from reminder messages.

To simultaneously understand giving and unsubscription behavior, we develop a dynamic model of warm-glow giving where individuals incur an annoyance cost every time the charity sends a fundraising

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appeal. Annoyance costs can be psychological costs such as guilt or perceived pressure or practical costs such as time and attention (Dana et al., 2007; Andreoni et al., 2017; DellaVigna et al., 2012; Knutsson et al., 2013; Cain et al., 2014; Trachtman et al., 2015). Every period, individuals decide whether to give or not if reminded about the donation possibility (Andreoni, 1989, 1990). In addition, individuals have the option to unsubscribe from future communication, making dynamic considerations relevant. By unsubscribing they avoid future annoyance costs associated with reminder messages, but they also risk missing future information and opportunities to donate. Our model predicts a higher rate of giving and a higher unsubscription rate in response to reminders. We show that the unsubscription decision further depends on whether people evaluate the option value of staying subscribed to be sufficiently large to justify anticipated future annoyance costs.

We test these predictions in two field experiments with a charity. The first experiment tests the prediction that reminders increase unsubscriptions by sending solicitation e-mails to approximately 17,000 warm-list donors, i.e., individuals who have donated to the charity in the recent past. Individuals in the control group receive one e-mail asking them to donate within ten days. People in the treatment group receive the same e-mail and an additional reminder one week later. In line with the predictions of the model, we find that the reminder significantly increases donations by two thirds, but also significantly increases unsubscriptions from the mailing list by a similar extent.

The second field experiment tests the prediction that the unsubscription choice is determined by the option value of subscribing and anticipated annoyance costs. A sample of approximately 43,000 previous donors receives a regular solicitation e-mail from the charity. In our Low Frequency treatment, we exogenously decrease anticipated annoyance costs relative to the control treatment by announcing that the charity will only send *one* e-mail in the next three months, instead of the regular monthly one. In the Future Benefit treatment, we increase the option value of staying on the list by announcing that next month an anonymous donor will make a donation for every person who donates in response to the next e-mail. In line with our model predictions, we find that announcing a reduced frequency of mailings significantly decreases the number of unsubscriptions relative to the control treatment by 39%. Announcing a future matching opportunity also reduces the number of unsubscriptions, but this result is only marginally significant. The treatments have no effect on the decision to donate or the donated amount, consistent with our model.

Using data from the second experiment, we structurally estimate the annoyance costs of being solicited through e-mail. Adding a structural estimation to the reduced form results enables us to study the underlying annoyance costs and provides inputs for a welfare analysis. We identify parameters influencing giving behavior from panel data on donations by individuals in the second experiment and we pin down the annoyance cost from the unsubscription rate. For the potential donor, there is a trade-off between annoyance costs and warm-glow from giving. We estimate the costs associated with *receiving* a reminder to 12.95 DKK ($1.95). This negative amount is on average slightly outweighed by the benefits of warm-glow from donating leading to an average welfare gain of 1.50 DKK ($0.23). However, by failing to consider the annoyance costs, a standard welfare evaluation would overstate the benefits of the reminder by a factor of ten.

We then consider the perspective of the charity by estimating the impact of a reminder on donations. When accounting for the long-term effects of unsubscriptions on giving, we find that the net effect for the charity of sending a reminder is just 1.33 DKK ($0.20) per potential donor when using a discount rate of 10%. With a discount rate of 2% the net effect for the charity is negative.

The findings have important implications for public policy. The increasing volume of reminders, fueled by the encouraging results of previous studies, creates heretofore unanticipated costs for both receivers and senders. A one sided and short-term analysis based solely on the intended behavioral outcome, as is common today, can lead to negative surprises in the long-run. We encourage academics and policy makers to pay more attention to overall welfare effects.

2. Model

Building on the work by Andreoni (1989, 1990), we present a dynamic T-period model of giving and unsubscription behavior which includes a fixed cost of each solicitation to the potential donor. The potential donor chooses both whether to give and whether to unsubscribe.[1]

We consider a repeated interaction between a charity and a warm-list donor who is asked to give via e-mails. We refer to the potential donor simply as "the donor" and to the solicitations as "the messages". In every period $t \in \{1,2,\ldots,T\}$, the donor must decide if he wants to donate and if so, how much. In addition, whenever he receives a message, he decides if he wants to unsubscribe from future messages sent by the charity.

We assume that the donor receives warm-glow utility from every donation $g_t \geq 0$ to the charity. We denote the warm-glow utility from giving by $v(g_t)$.[2] We model the cost of giving by the function $c(g_t)$ and assume that this captures all costs associated with giving, including the reduction in consumption utility, transaction costs, and opportunity costs. The net donation utility from giving g_t is therefore

$$d(g_t, a_t) = a_t v(g_t) - c(g_t)$$

where a_t is the weight on warm-glow utility.[3] The law of motion for a_t is given by an AR(1) process

$$a_t = \mu + \rho a_{t-1} + \varepsilon_t$$

where $\varepsilon_t \sim IID(0,\sigma^2)$ on a finite support $[-M,M]$, i.e., $M < \infty$. The AR (1) process introduces time-variation in the weight on warm-glow utility which can capture both variations in warm-glow from different fundraising campaigns and variations in the cost of giving, e.g. due to time-varying opportunity costs.[4]

To capture the effect of reminders, we assume that the donor has limited attention and therefore only remembers the donation problem with probability $\theta \in [0,1)$ in every period. If the donor is attentive and remembers the donation decision, he gives an amount $g_t \geq 0$ to the charity. On the other hand, if he is inattentive and forgets about the donation decision, then $g_t = 0$. Similar to the inattention models of Karlan et al. (2016) and Taubinsky (2013), we assume that the donor is sophisticated and therefore aware of his inattention.[5]

We assume that *any* message from the charity serves as a reminder of the donation problem because it brings the charity back to the mind of the donor. The message does not need to refer back to a previous message, but can stand individually. It is also not necessary that the message contains an explicit ask. We let p_t denote the probability that the charity sends a message in period t. The donor receives the message if he has not unsubscribed in any of the previous periods. If the donor is subscribed to messages in period *t and* the charity sends a message, then the donor always recalls the donation problem, otherwise the donation problem is only remembered with with probability θ.[6] Hence,

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[1] The technical details, including proofs, are provided in the Online Appendix.

[2] Note that although we refer to it as warm-glow utility, $v(\cdot)$ could also capture prestige or utility from conforming to social norms, and the model could easily be adapted to include pure altruism.

[3] We assume that the warm-glow and cost functions are well-behaved i.e. $v'(\cdot) > 0$, $v''(\cdot) < 0$, $\lim_{g_t \to \infty} v'(g_t) = 0$ and $c'(\cdot) > 0$. We further assume that $d''_{gg}(g_t, a_t) < 0$, $d(0,a_t)$

[4] We also note that a deterministic process for a_t would lead to a static problem where the donor either unsubscribes in period $t = 1$ or never unsubscribes.

[5] However, we note that the model does allow for overconfidence about prospective memory for donation decisions, as studied by for example Ericson (2011) and Letzler and Tasoff (2014), by letting θ being interpreted as the donor's subjective belief about the likelihood of remembering if not reminded.

[6] We note that θ can capture both natural recall and cues other than direct messages, e.g., general advertisements or news about catastrophes.

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