

Nudge me! Response to and demand for healthy habit reminders

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Extended Abstract

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Reminders and notifications can be a powerful tool for behavior change. A large number of papers show that reminders are indeed successful in capturing our attention and influencing behavior in the context of gym attendance (Calzolari and Nardotto 2017), electricity consumption (Allcott and Rogers 2014, Gilbert and Zivin 2014), personal savings (Karlan et al. 2016), take-up of social benefits (Bhargava and Manoli 2015) and adherence to medical treatments (Vervloet et al. 2012, Altmann and Traxler 2014). However, the competition for our attention also creates adverse reactions as revealed by unsubscriptions from reminders (Damgaard and Gravert 2018) and by negative willingness to pay for reminders (Allcott and Kessler 2019) despite their potential benefits. Undesired, too frequent and unhelpful reminders can create annoyance costs and distract attention from more beneficial thoughts and decisions. It is therefore crucial that we investigate the demand for reminders, the cognitive mechanisms being triggered by reminders and how reminders can be better targeted to avoid adverse effects.

This paper investigates the mechanisms through which reminders steer attention and affect behavior and measures the demand for different types of reminders. We develop a novel theoretical framework which we then test in a large scale field experiment. Our model considers three mechanisms: a pure attention shift, a shift in beliefs about the benefits of the behavior and a shift in psychological utility from being reminded. The first mechanism is straightforward and the mechanism most often stressed in the existing literature. Reminders redirect attention towards a desired behavior the decision maker was intending to carry out, but for some reason was not paying attention to. Second, reminders might affect beliefs about how important an action is by conveying information about the behavior (as in several information interventions such as cite). And third, reminders could create psychological costs such as guilt for having forgotten and thus not having carried out a behavior (as in tax reminders, fundraising mails etc.).

While the model is general enough to be used in many cases of repeated, beneficial behavior, we will test the model in the context of medication adherence. We use the predictions from the model to inform our field experiment with 18,400 expecting mothers in South Africa. The behavior we are interested in affecting is adherence to iron supplements during pregnancy. Despite the clear health benefit to the individual and the small effort costs of taking a pill, the literature on medication adherence shows, that only around 50% of prescribed medication is taken as intended (Haynes et al. 2002, WHO 2003). This makes medication adherence an ideal setting to test our behavioral theory.

We invited a random sample of pregnant women already signed up on a mobile health platform to take part in our incentivized, text-message based study over the course of three months. 4226 women opted in to our study and were randomized into six treatment arms. The expecting mothers received different types of reminder messages, belief elicitations, survey questions and knowledge quizzes as well as a willingness-to-pay elicitation for additional reminders after having been exposed to our treatments. We measure the participants' engagement with the program, by measuring the unsubscription rate and the frequency of responding to questions and tasks, their stated adherence, and their willingness to pay for additional reminders.

Our results show an overall very high engagement with the program. The unsubscription rate from the reminders is 0.005%, far below our initial expectations and far below attrition in similar field studies. Active engagement is very high with 82.2% of women still responding to the survey two months after opting in.

We find an overall high stated adherence of taking the pills. In line with our model, receiving additional reminders has a significant positive effect on adherence. Also in line with our predictions, receiving an emotional prompt has a marginally significant positive effect on stated adherence. However, contrary to our predictions, receiving additional information with the reminders has a significantly negative effect.

Further, we elicit women's willingness to pay for additional reminders after four weeks of receiving reminders (or not). The women randomly receive one of four text messages that asks them to choose between a monetary amount and no reminders and a different amount and daily reminders for the next two weeks. If the monetary amount is equal whether with or without reminders, we find that 82.95% of women opt for the reminders. This share increases to 95% when they would need to pay *not to get* reminders. In the case when they need to pay to receive reminders, the share wanting reminders is around 40%. We find that as with adherence and in line with our model, having received pure reminders significantly increases the demand for additional reminders, but having received additional information reduces the demand. The emotional prompt has a positive, marginally significant effect on demand. So even though we start with a high baseline demand for reminders, we find that our treatments significantly affect demand.

Reducing cognitive load by steering attention seems to be the main driver of these reminders, as evidenced by the high demand for reminders, despite an already high adherence rate. Contrary to our theoretical predictions, we find a consistent negative effect of additional information to the reminders. Given that traditional theory would assume that more information is always better and that irrelevant information can easily be ignored, a significant negative effect is surprising.