

# Using Behavioral Insights to Decrease Non-Payment for Water

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## Extended Abstract

Utilities such as water and electricity play an essential role for economic development. At the same time, they are a basic human need. These two sides turn non-payments for utilities into a thorny problem. Defaults on payments constrain the maintenance and expansion of infrastructure. This is a particular problem in developing and transition countries (Aguilar-benitez, Saphores, 2008; Szabo and Ujhelyi, 2015), where inadequate infrastructure is often a crucial bottleneck to development and public revenues, even as a share of GDP, are typically much lower than in developed countries (Besley and Persson, 2014). Free-riding can also threaten the legitimacy of revenue collection as willing payers question the fairness of the system. Denying access to non-paying customers, however, is problematic as services such as water and electricity are necessary for a healthy and decent life (as acknowledged by the UN sustainable development goals). Many countries consequently have legal provisions against, for instance, cutting off the supply of water (Finger, Allouche, & Luis-Manso, 2007). In such a setting, where sanctioning strategies are inadequate, behavioral nudges may offer a powerful alternative approach (Chetty, 2015).

In a natural field experiment (Harrison and List, 2004) in Namibia, we study reasons for insufficient payments for water as well as the power of easily scalable, behaviorally informed interventions to improve payment behavior. Namibia is an ideal location for this research endeavor: First, unpaid water bills are common. At the start of our intervention, 41% of our eventually treated customers had at least three outstanding average bills, which corresponds to an average debt of 35 USD. Second, payment enforcement through legal action is slow and sanctioning of defaults by cutting off supply is difficult due to legal, technical and logistical constraints.

In cooperation with Namibia Water Corporation Ltd. (NamWater), we treat 9,662 rural customers in an area of 84,610 square kilometers (about the size of Austria) in northern Namibia over a time period of nine months (October 2015 to June 2016). To identify potential behavioral bottlenecks (Datta and Mullainathan, 2015) for insufficient payments and to design promising behavioral interventions, we conduct extensive pre-intervention interviews. We conduct a randomized telephone survey with about 350 participants as well as face-to-face interviews in Namibia's capital, Windhoek. The pre-intervention surveys deliver two major

findings: First, customers have problems receiving or understanding their invoice. 42% of customers state to have experienced problems with late or no delivery of invoices and more than half of participants have difficulties explaining a typical invoice letter. This finding motivates our baseline treatment, in which we offer customers a free monthly text message service containing simplified invoice information in a non-technical language. Second, a remarkably high share of customers seems willing to pay for water: 98% of customers state that water should be paid for and 92% name reasons why water needs to be paid for (e.g. “purification” or “maintenance”). Most importantly, in an incentivized experimental allocation game, survey participants would on average spend 75% of a substantial potential lottery win to reduce arrears. Strikingly, customers with higher debt allocate significantly more to debt reduction.

To investigate whether the striking discrepancy between customers’ views and actions results from an intention-to-action gap (and not from a particularly strong social desirability bias), we implement two commitment treatments. Customers in these treatment also receive the free text message but are in addition exposed to one of two behavioral interventions that have been shown to mitigate intention-to-action gaps.

In the first commitment treatment (“self-concept”), we intend to evoke a water-paying self-concept by asking for example “How important is it to you to be a reliable water payer?”. This type of intervention uses individuals’ desire to shape their own identities and the desire to act consistently with ones stated beliefs and actions (Festinger, 1957). We expected this intervention to be effective since the customers perceive water payments as important and normatively desirable. Self-concept treatments have been used to increase voter turnout (Bryan et. al., 2011), decrease cheating (Bryan, Adams and Monin, 2013) and improve helping (Bryan, Master and Walton, 2014).

In our second commitment treatment (“implementation”), we elicit implementation intentions about future payments by asking for example “How do you make sure you pay your bills on time?”. The elicitation of when, where and how to pay creates cognitive links between future situation and behavior (Gollwitzer, 1999; Gollwitzer and Sheeran, 2006). Once an environmental cue becomes available (in our case the individualized invoice text message), people “automatically switch” to their intended behavior. Implementation intention treatments have been used to increase voter participation (Nickerson and Rogers, 2010), vaccination rates (Milkman et. al., 2011) or exercising (Milne, Orbell and Sheeran, 2002).

The contribution of this paper is threefold: Firstly, we are the first to provide evidence on such commitment strategies on an outcome that is monetarily costly to the customer and has a public good character. Secondly, in contrast to one-time decisions like organ donations or vaccinations, we provide long-term evidence in a domain where recurrent action is necessary. This is important because behavioral interventions may induce rebound effects in the long-term, resulting in the absence of a net effect (Sunstein, 2016). These concerns are particularly important for interventions that target payment behavior. Households might budget over

time such that higher payments in the present could induce lower payments in the future. In addition, psychological licensing effects (Merritt, Effron and Monin, 2010) suggest that higher payments in initial periods could justify lower payment in subsequent periods. On the other hand, the literature on consistency and habit formation suggest positive spill-overs from short-term to long-term effects (Neal, Wood, Labrecque and Lally, 2012, Frey and Rogers, 2014). Evidence on behavioral long-term effects would therefore be important but is largely lacking. Thirdly, we provide evidence on heterogeneous effects among customers with high or low debt. Observing the effectiveness of these interventions among high debt customers is important because reducing free-riders can be a desirable policy goal due to fairness concerns and to stop a downward spiral of otherwise willing payers.

We find strong treatment effects: In the first month, average payments increase by 9% in the self-concept treatment and by 19% in the implementation treatment in comparison to the baseline. Water consumption is unaffected in the long-term. We do not observe any rebound effects. However, we find that the influence of the commitment treatments fades out over time. The commitment treatments are most effective among high debt customers, which is not only desirable from a policy perspective but also consistent with the behavioral diagnosis that informed the intervention: commitment strategies can help to close an intention-to-action gap.

By comparing the baseline (SMS only) to an untreated group of customers, we estimate a large additional effect of the SMS itself. Receiving the SMS with simplified invoice information raises average payments by more than 25%, both in the first month and over the course of the intervention. On average, the treatments increase payments by about 10 USD per customer, which roughly corresponds to 4-5 hourly wages. This makes this cheap intervention highly cost effective: A back-of-the-envelope calculation suggests a return-on-investment beyond 1000%. Our study thus emphasizes the potential of behaviorally-informed interventions in a setting where traditional economic tools such as sanctioning customers by cutting off supply is difficult or undesirable.

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