Saving Power to Conserve Your Reputation?
The effectiveness of private versus public information

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Abstract

Environmental damage is usually an unseen byproduct of other activities, with consumers and those around them unaware of the harm they are causing. Private information about the environmental impact of their own actions can help consumers reduce the costs of conservation behavior or increase the moral benefit of conserving. If this same information is disclosed publicly, it provides an additional motivation for conservation – reputation. By making green actions visible, public information allows environmentally friendly behaviors to act as a signal of green virtue. In this paper we contrast the efficacy of private information with that of public information in a unique field experiment in the residence halls at the University of California – Los Angeles. We provide private information to residents in the form of real-time feedback over energy usage and social norms, while public information takes the form of a publicly visible energy conservation rating. While we find no average effect of private information, we did find that that public information effectively motivated electricity users to reduce consumption by 20 percent. This reduction was sustained even after public information was no longer being disclosed.

Executive Summary

Environmental damage is often an unseen byproduct of other activities, with both consumers and those around them unable to gauge the impacts of their actions. Policies that correct this information asymmetry have the potential to encourage environmentally friendly behavior by consumers. Such information policies are becoming increasingly prevalent: eco-labels, which intend to reduce the information asymmetry between producers and consumers (Crespi & Marette, 2005; Leire & Thidell, 2005), have expanded from a mere dozen worldwide in the 1990s to more than 377 programs today. Improved feedback over water, electricity and gas usage, which aims to better inform consumers about the impacts of their actions (Fischer, 2008), has resulted in the mass rollout of smart energy meters, with 76 million already installed worldwide. Mandatory and voluntary corporate disclosure systems are increasingly being used to replace or augment government regulation (Khanna, 2001; Delmas et al, 2009), with common examples including the toxics release inventory, lead paint disclosures, drinking water quality notices, and the International Standards Organization's voluntary ISO 14001 program. Yet despite the popularity of information policies, we still have little understanding of their effectiveness.

In this paper we evaluate the effectiveness of two different information policies in inducing electricity conservation. Electricity usage is a useful vehicle for assessing the impact of information treatments because it is generally invisible to both consumers and those around them. In the United States, most residential and commercial electricity users receive no information over their electricity usage apart from their monthly bills, which do not disaggregate across time periods or sources of usage. Understanding the potential mechanisms to induce

energy conservation is an essential part of addressing climate change, since more than one quarter of all U.S. carbon dioxide emissions stem from electricity generation for commercial and residential customers (EPA 2010, EIA 2010). Recent studies estimate that residential energy consumption could be reduced by 22 to 30 percent within the next five to eight years purely through behavioral changes (Laitner et al, 2009; Gardner & Stern, 2008). Thus information policies, which can change the costs and benefits of conservation, have the potential to become a major driver of behavioral change.

One potentially major informational tool is the provision of detailed feedback to consumers over their own energy usage. Such information can allow consumers to better understand the costs of their actions, leading to improved energy usage decisions (Fischer 2008). Surveys of the existing feedback literature report savings in the range of 4 to 12 percent, with the highest savings coming from real-time feedback (Darby, 2006; Abrahamse et al, 2005; Ehrhardt-Martinez et al, 2010). However, not all results are this positive, and many studies have found no statistically significant reduction, (Kihm et al, 2010: Klos et al, 2008; Allen & Janda, 2006), increased usage (Sulyma et al, 2008; Sexton et al., 1987), and heterogeneous responses (Van Houwelingin & Van Raaij, 1989; Brandon & Lewis. 1999; Parker et al, 2006). Moreover many of these studies suffer from methodical difficulties in that they involve small samples (e.g. Parker et al, 2006; Allen & Janda, 2006) or short time periods (e.g. Peterson et al, 2007).

Another behavioral tool is to provide consumers with aggregate information about energy usage. This can create a social norm over electricity usage that increases the moral costs of not conserving (Levitt and List, 2007). Social norms have been shown to be effective at inducing energy conservation amongst consumers in a number of large-scale, long-term experiments (Schultz et al, 2007; Ayers et al, 2009; Allcot, 2010), although Costa and Kahn (forthcoming) showed that the effects of social norms may depend on an individual's own ideology.
Both individual feedback and social norm information can be termed *private information* in that they are privately disclosed information about an agent's own (relative) environmental impacts. We introduce a new behavioral innovation – public information - and evaluate its efficacy relative to private information in a unique field experiment in the residence halls of the University of California Los Angeles (UCLA). *Public information* publicly discloses information about a specific agent's behavioral impact, allowing environmentally friendly behaviors to act as a signal of "green" virtue. These reputational benefits can motivate conservation amongst consumers. Since both private and public information are non-pecuniary behavioral interventions, testing their efficacy in an environment devoid of complicating pecuniary motivations is ideal. Thus students in residence halls, who do not pay electricity bills, are the perfect subjects for such an experiment. In a nine-month long experiment, participants were given private information in the form of real-time feedback and social norms over their room's energy usage. A subset of participants also had their energy usage made public in the form of posters that described their room as being an above/below average energy conserver. We found that private information alone was not sufficient to motivate statistically significant energy savings in our sample. However, when we combined private information with public information, we induced an average energy saving of 20 percent, with the majority of saving coming from high energy users. When this public information was removed, this conservation behavior continued to persist, even three months later, indicating habit formation. We are the first study to use public information to induce conservation amongst individuals.

In a world where electricity is a small component of household expenditure and price increases are politically difficult to implement, behavioral "nudges" are a necessary tool to induce energy conservation. The heterogeneity of consumers means that a one-size-fits-all solution is unlikely to be successful, and hence behavioral scientists need a varied toolkit that appeals to a variety of motivations. Compared to other policies such as pecuniary incentives, information policies are a relatively cheap way to encourage conservation, especially in this age of mass information and telecommunication technology. We show that public information or "conspicuous conservation" can be an effective and valuable part of this toolkit. Public information is particularly useful in that it can motive conservation among all consumers, *including* those who are not intrinsically motivated to conserve energy.