

# **The Dynamics of Behavior Change: Evidence from Energy Conservation**

2-page summary

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Information programs solve problems of imperfect information in markets—often helping individuals and institutions make better consumption or investment decisions, and overcome cognitive or behavioral biases, commensurate with policy objectives (Thaler and Sunstein 2008, Ratner et. al. 2008). Behavior change scholars have used information framing in a wide range of decision-making domains, including saving money for retirement (Benartzi and Thaler 2007); reducing poverty and improving access to financial institutions (Bertrand, Mullainathan, and Shafir 2006); designing health behavior programs (Rothman and Salovey 1997; Rothman et.al. 2006; Block and Keller 1995; Keller and Lehman 2008); and encouraging resource conservation (Schultz et.al. 2007). In this paper, we provide theory and experimental evidence from a randomized trial that behavior change can be incentivized with non-price based framing interventions over time.

Studying the dynamics of framing is important because organizations can use framing interventions strategically to increase behavioral compliance, particularly in settings where price-based strategies may be limited in effectiveness—for instance, in healthy eating or retirement programs, exercise campaigns or resource conservation problems broadly. We use information-based strategy to motivate behavior change and consumer decision-making about household energy conservation.

Little is known about the effect of message framing on conservation behavior over time. In a randomized controlled trial (RCT) with residential consumers, we test how different messages about household energy use impact the dynamics of conservation behavior down to the appliance level. Our experimental results show that differences in behavioral responses to information framing become more significant over time.

Using a health-based frame, in which consumers consider the human health effects of their marginal electricity use, induced persistent energy savings behavior; whereas using a more traditional cost savings frame, drove sharp attenuation of treatment effects over time. Our results suggest that health-based considerations have greater longevity versus small monetary rewards in meeting energy conservation goals. We discuss the implications of our findings for the design of effective information campaigns to engage consumers on household consumption decisions.

We show that tailored information disclosures about the environmental and health impacts of household electricity use—such as pounds of air pollutants, childhood asthma and

cancer—can be very salient with residential consumers and lead to more lasting behavioral effects versus traditional information framing based on cost savings.

The idea that a non-monetary, information strategy centered on environment and health, could produce energy conservation, without a significant change in economic incentives, advances our understanding of the range of large-scale behavioral science based interventions that can be implemented. Conservation is short-lived when the curtailment decision is framed as a monetary reward and is more persistent when it is framed as a health-based community concern. Our article builds on a body of work by psychologists and behavioral economists on the use of non-pecuniary, information strategies for behavioral change. We advance this literature by introducing a new class of non-price incentives for behavior change, with demonstrated, economically significant conservation effects with residential electricity consumers.

Human health effects are the basis of most modern forms of environmental regulation and are the primary drivers of social costs of electricity production—a point not commonly known or understood by consumers when making marginal consumption decisions. In this article, we discuss emerging experimental methods for the analysis of sustainability behavior by individuals with next generation smart metering and information technologies. We model the dynamics of behavior change at high frequency with an approach that is consistent with behavioral principles of limited information processing by consumers, dynamic learning and evolution, and with two distinct mechanisms of cue-based changes in consumer behavior; shedding light on how framing-based interventions can be designed with behavioral persistence in mind.

Keywords: energy conservation, information strategies, framing, dynamic treatment effects

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