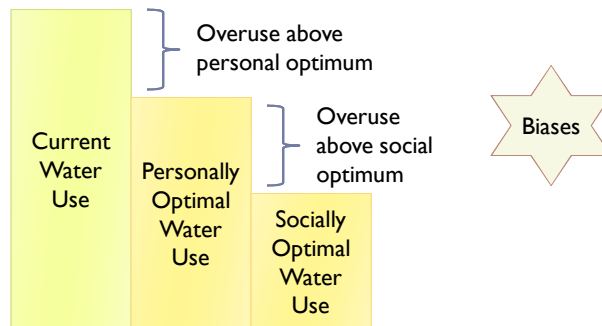


Insights from Behavioral Economics to Inform Water Policy

Understanding Residential Water Use: New Approaches to Analyzing, Projecting and Managing Demand

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The Problem...



▶ From: Annika Todd (2010), Precourt Energy Efficient Center, Stanford University.

The Opportunity...

- ▶ Behavioral Economics provides insights to identify and address these biases and thereby move current consumption closer to the social optimum.
- ▶ Traditional economics assumes that individuals' preferences are (1) time-consistent, (2) affected only by consideration of their own private benefits, and (3) independent of how their decisions are framed or communicated to them.
- ▶ Laboratory and field experiments suggest these assumptions may be false.
- ▶ By understanding these assumptions better, we can design more effective programs and policies.

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Pro-social Behavior

- ▶ People tend to care about the welfare of other people and what other people believe.
 - ▶ e.g., people commonly engage in activities that are costly to themselves and that benefit others. They volunteer, help strangers, vote, give to charitable organizations, donate blood, or join rescue squads.
- ▶ If we understand what motivates pro-social behavior, we can harness these motivations to affect water use.
- ▶ Hard part: there are competing explanations about these motivations: trust, reciprocity, social approval, social preferences, conformity, ...

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Pro-social Behavior – Field experiment evidence

- ▶ Programs that harness pro-social behaviors can increase private contributions to public goods
 - ▶ e.g., Yoeli (2009) found that participants are more likely to participate in an energy blackout program when their decision to participate is revealed to their neighbors.

- ▶ Programs that harness pro-social behaviors can reduce water use
 - ▶ e.g., Ferraro and Miranda (2011) found that social comparisons induce greater water use reductions by highlighting social norms.

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Social comparison example

- ▶ Your own total consumption June to October 2006: 52,000 gallons

- ▶ Your neighbors' average (median) consumption June to October 2006: 35,000 gallons

- ▶ You consumed more water than 73% of your Cobb County neighbors.

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Traditional vs. Behavioral Econ. Approaches

- ▶ Connection between traditional forms of management (e.g., regulation, prices, technology subsidies) and new forms inspired by behavioral economics (e.g., pro-social behaviors, framing changes)?
 - ▶ Are they complements or substitutes?
 - ▶ Can we take advantage of both forms simultaneously?
 - ▶ To answer these questions, we must use controlled experiments that test them independently and jointly.

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Complements or Substitutes?

- ▶ Do traditional and pro-social approaches operate independently or do they interact?
 - ▶ Some research suggests that they interact, and not always in a complementary way.
- ▶ Regulation and monetary penalties (e.g., prices, fines) might reduce pro-social behaviors
 - ▶ Regulation (Cardenas and Stranlund, 2000)
 - ▶ Taxes (Goeschl and Perino, 2009)
 - ▶ Monetary penalties (Gneezy and Rustichini, 2000)

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Other aspects of complementarity?

▶ Targeting by user groups:

Water use in high-use and high-income households is

- ▶ More responsive to social comparisons according to field experiment.
- ▶ Less price sensitive according to other research (e.g., Mansur & Olmstead 2007).

▶ Persistence:

- ▶ Social comparison effect in water experiment was immediately detectable one month later.
- ▶ But effect declines over time (but two years after, effects are still present but smaller).

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Complements or Substitutes?

▶ Thus, important to understand under which conditions they are complementary.

- ▶ “Effects of incentives depend on how they are designed, the form in which they are given (monetary or nonmonetary), how they interact with intrinsic motivations and social motivations, and what happens after they are withdrawn” (Gneezy et. al, 2011)

▶ More field experiments are needed in which utilities partner with scholars to design the experiments and analyze the results in ways that inform program designs.

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Price and Non-Price Incentives

- ▶ Can we directly test the hypothesis of complementarity between the two approaches by randomly assigning pecuniary and non-pecuniary incentives, in isolation and in combination?
- ▶ Difficult but not impossible.
 - ▶ e.g., Smart Pilot Project in Ontario, Canada.
 - ▶ Two ways of price randomization:
 - ▶ Treatment with price increase, their price was reduced to off-set the increase.
 - ▶ Treatment with rebate plan.