Understanding the Causal Mechanisms of Social Comparison Nudges

FROM "DO THEY WORK?" TO "WHY THEY WORK"

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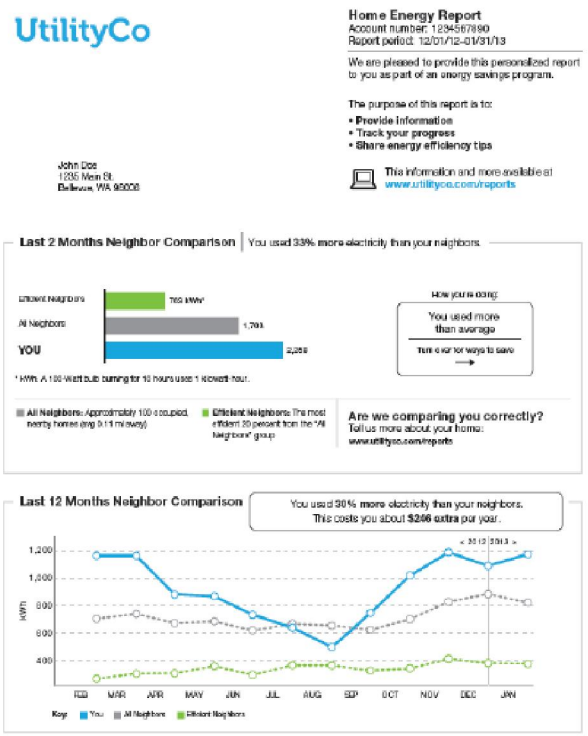
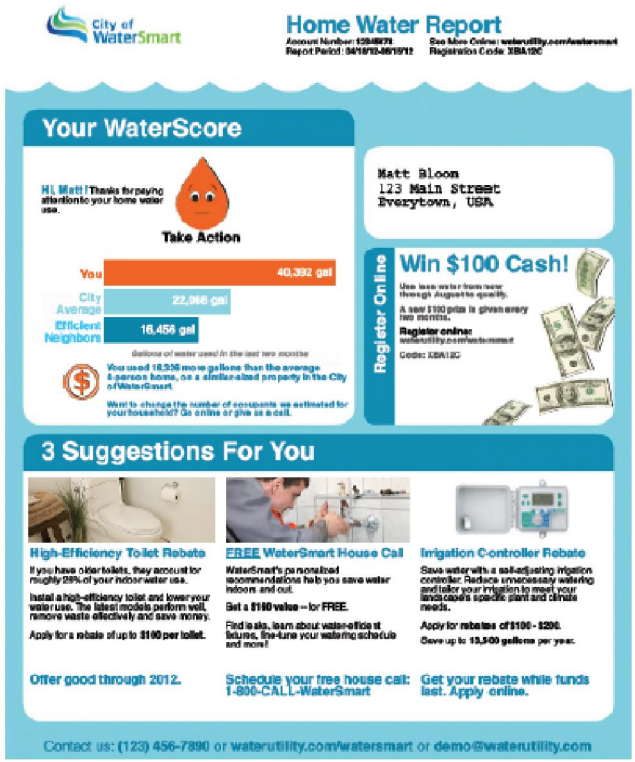
Social Comparisons





How Treatments Differ

- **Targeted Behavior (ie. water vs electricity)**
- **Treatment Length**
- **Treatment Frequency**
- **Normative Message (ie. framing or injunctive norms)**
- **Selected Reference Point (ie. median consumer or “efficient consumer”)**
- **Delivery Channel (ie. mailed home energy report vs email message)**
- **Complementary Information (ie. “tips” vs high resolution dashboards)**

Treatment Effects of Social Comparisons

Study	Average Treatment Effect	
Ayres et al 2009 (PSE)	1.2%	-Variation of Opower treatment -Electricity and natural gas
Allcott 2011	2.03% (1.37-3.32%)	-Variation of Opower treatment -Electricity
Costa Kahn 2013	2.1%	-Variation of Opower treatment -Electricity
Ayres et al 2009 (SMUD)	2.1%	-Variation of Opower treatment -Electricity
Allcott Rogers 2012	3%	-Variation of Opower treatment -Electricity
Byrne et al 2014	4.6%	-AU study -High electricity prices -Online HER -Bi-weekly emails -Electricity
Ferraro Price 2013	4.7%	-One time mailing -Water
Schultz et al 2007	4.78%	-Two message treatment -Handwritten door hangers -Electricity
Brent et al Forthcoming	6.2%	-Mailed HWR -Water
Dolan Metcalfe 2013	10.8%	-UK study -Low energy prices -Small housing complex -Efficient homes with smart thermostats -Natural gas only

Hypotheses

1. Financial Motivation (Utility maximization/cost minimization)
   - Social Learning
2. Prosocial Motivation (Pro-environmental attitudes, desire to conserve scarce public goods, etc.)
   - Social Learning
   - Moral Cost
   - Relative Utility
3. Image/Reputation Motivation
4. Multiply Determined (aka two or more motivations at work)
   - Individual-Level
   - Group-Level

The Importance of Understanding Motivation

- Improved ability to predict treatment effects across distinct populations (Alcott, 2014)
- Identification of effective targeting strategies (Ferraro Miranda, 2013)
- Determine the ability of strategic frames to amplify or undermine responses (Asensio Delmas, Forthcoming)
- Understand the interaction of social comparisons with information provision, controls, and prices.

Predictions: Financial Motivation

1. Most effective when information is low
2. Consumers above and below average will converge toward the median (aka boomerang effect)
3. More effective among cost-conscious consumers
4. Potentially less persistent (if changes in behavior are not welfare improving)

Predictions: Prosocial Motivation

1. Unidirectional drive upward (no/low boomerang)
2. Most effective among individuals with high intrinsic motivations ie. environmentalists, liberals, frequent voters etc.
3. Likely persistent

Predictions: Multiply Determined

1. Individual-Level: Differences in response to framing/prime
2. Group-Level: Effects(magnitude and dynamics) varying across populations

Evidence: Boomerang Effect (asymmetric response among high and low-users)

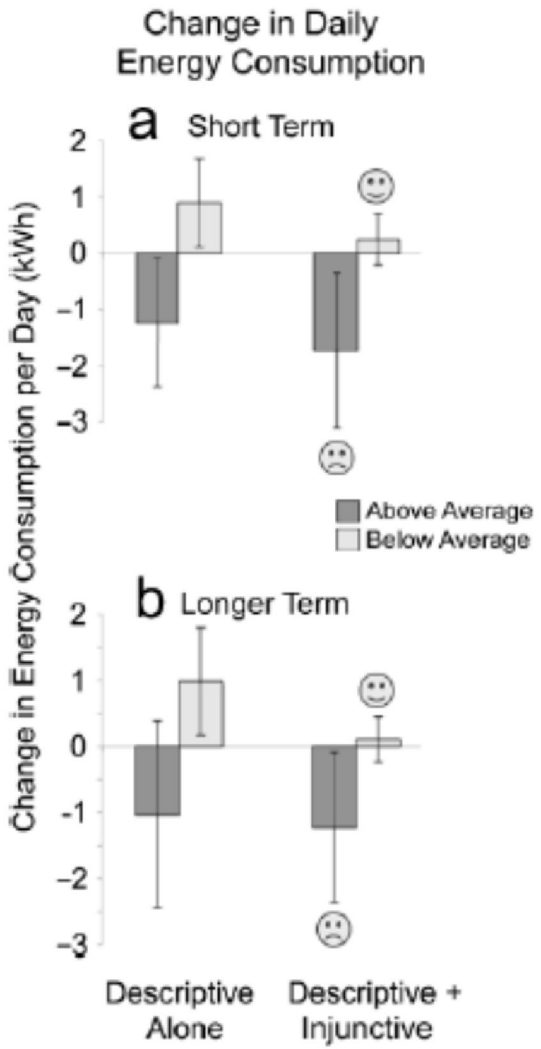
Found	Not Found
Schultz et al 2007	Allcott et al 2011
Ayres et al 2009	Ferraro Price 2013
Costa Kahn 2013 (among conservatives)	Costa Kahn 2013 (among liberals)

Evidence: Heterogeneity

- Costa Kahn 2013: Conservative treatment effect of 1.7 and a liberal treatment effect of 2.4%
- Bolsen et al 2013: Differences in treatment effect correlated with voting frequency

	Info	Weak Norm	Strong Norm
Registered non-voter	No detectable effect	695 gallon reduction	1,380 gallon reduction
Registered households with highest voting frequency	1,625 gallon reduction	2,685 gallon reduction	3,237 gallon reduction

Evidence: Priming



From Schultz et al 2007

Predictions: Financial Motivation

1. Most effective when information is low Some evidence of complementarity, more research needed
2. Consumers above and below average will converge toward the median (aka boomerang effect) Evidence among conservatives and underestimators, and in some, but not all, populations. The boomerang is also eliminated (in some cases) when injunctive norms (ie. emoticons) are employed (Schultz et al 2007)
3. More effective among cost-conscious consumers No evidence of larger treatment effects among low-income (as seen in related Ito Ida Tanaka Draft paper) but Delmas Lessem found no effect among households (dorm residents) who do not pay for utilities directly
4. Potentially less persistent (if changes in behavior are not welfare improving) Some evidence from Asensio Delmas Forthcoming

Predictions: Prosocial Motivation

1. Unidirectional drive upward (no/low boomerang) Evidence among liberals (Costa Kahn 2013), with the addition among injunctive norms (Schultz et al 2007) and in other scenarios (Ferraro Price 2013) (Allcott 2011)
2. Most effective among individuals with high intrinsic motivations ie. environmentalists, liberals, frequent voters etc. Confirming evidence from (Costa Kahn 2013) (Byrne et al 2014) (Bolsen et al 2013)
3. Likely persistent Evidence from Asensio Delmas Forthcoming
4. Evidence from other experimental studies: Households pay a premium to offset externalities of consumption (Kotchen Moore 2007), and frequently exhibit consumption rebounds after externality offsetting (Jacobsen et al 2012) (Harding Rapson Forthcoming)

Predictions: Multiply Determined

1. Individual-Level: Differences in response to framing/prime Confirmatory evidence form Schultz et al 2007 (on the use of injunctive norms) and Asensio Delmas Forthcoming
2. Group-Level: Effects(magnitude and dynamics) varying across populations Evidence from Allcott 2014, Brent Forthcoming and others

Policy Implications and Future Research Directions

- Choosing the right frames/primes
  - Finding frames that don't undermine motivations
  - Exploring frames that are effective across ideological lines
  - Message targeting
- Exploring norm-based interventions on investment and enrollment (as compared to conservation) (Yoeli et al 2013)
- Identifying how social comparisons treatment interact with the decision environment
  - Interaction with more granular consumption data and decision support
  - Treatment effects with rising prices