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

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

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<tr>
<th>Found</th>
<th>Not Found</th>
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<tr>
<td>Schultz et al 2007</td>
<td>Allcott et al 2011</td>
</tr>
<tr>
<td>Ayres et al 2009</td>
<td>Ferraro Price 2013</td>
</tr>
<tr>
<td>Costa Kahn 2013 (among conservatives)</td>
<td>Costa Kahn 2013 (among liberals)</td>
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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

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<thead>
<tr>
<th>Info</th>
<th>Weak Norm</th>
<th>Strong Norm</th>
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<tbody>
<tr>
<td>Registered non-voter</td>
<td>No detectable effect</td>
<td>695 gallon reduction</td>
</tr>
<tr>
<td>Registered households with highest voting frequency</td>
<td>1,625 gallon reduction</td>
<td>2,685 gallon reduction</td>
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</table>
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 from 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