Does the Energy-Friendly SUV Driver Exist in People’s Minds?

Judging Energy Consumption Based on the Symbolic Significance of Behaviors

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Who is more energy conscious?

Mr. Smith
11,400 km per year

Ms. Miller
28,700 km per year
Background & Aim

- Energy-saving behavior is preceded by cognitive evaluations of behavioral alternatives
  - Accurate evaluations are a precondition for effective behavior
  - Misconceptions impede adoption of adequate behavior

- Development of interventions
  ⇒ Understanding energy-related judgment and decision-making
  ⇒ Identification of misconceptions and biases
Background & Aim

- Symbolic meaning
  - Behaviors carry *symbolic meaning* (Blumer, 1969)
  - Behaviors differ in symbolic significance

- Heuristics
  - People rely on heuristics; a target attribute (not readily accessible) is assessed by *substituting a heuristic attribute* (Kahneman & Frederick, 2002)
  - The heuristic attribute differs from the target attribute
    ➔ Systematic biases
Background & Aim

⇒ Behavior’s *symbolic significance* may serve as a heuristic attribute

⇒ Biased judgments

- **Underestimation** of energy consumption in cases of positive symbolically significant behaviors
- **Overestimation** of energy consumption in cases of negative symbolically significant behaviors
Study 1 – Method & Sample

- Online study
  - Internet panel members of the Consumer Behavior group
  - 10 minutes

- Sample
  - 246 participants
  - 61.4 % men, 38.6 % women
  - Mean age 54 years ($SD = 14$)
Study 1 – Material

- Car driver with symbolically significant positive behavior:
  „Mr. Meier drives a Toyota Prius with energy label A with hybrid drive. Mr. Meier covers a distance of 28,700 km with his car per year.”

- Car driver with symbolically significant negative behavior:
  „Mr. Huber drives an SUV (sport utility vehicle) with energy label C. Mr. Huber covers a distance of 11,400 km with his car per year.”

How energy conscious do you consider Mr. Meier / Huber?
Study 1 – Results

- No Comparability: \( t(162) = 14.40, p < .001, d = 2.25 \)
- Comparability: \( t(81) = 11.43, p < .001, d = 1.79 \)
Maybe someone who drives many miles is visiting family who live far away, or takes care of a disabled loved one … By setting up choices with limited knowledge of the circumstances of these drivers’ lives, there are no correct answers.

If the Prius driver “must” drive that much per year, the fact that he’s driving a Prius means he’s doing everything he can to minimize fuel usage given the mileage requirement. The SUV driver, on the other hand, could theoretically “do more”…
Study 2 – Aim

- Rule out alternative explanations
  - Assumption that *differing purposes or situational circumstances* underlie behavior
  - Generalization to other behaviors

- Test robustness
  - Provide **detailed information** on energy consumption
  - Specifically ask for judgment of energy consumption
Study 2 – Method & Sample

- Online study
  - Internet panel members of Swiss market research institute
  - 10 minutes

- Sample
  - 507 participants
  - 56.8 % women, 43.2 % men
  - Mean age 47 years ($SD = 14$)
Study 2 – Material

- Car driver with symbolically significant positive behavior:
  „Mr. Meier drives a Toyota Prius with energy label A with hybrid drive with a fuel consumption of 3.9 l/100 km. Mr. Meier lives in the city and spends his leisure time preferably in nature, in the mountains. In his leisure time, he covers a distance of 28,700 km with his car per year. He uses his car only in his leisure time.”

- Car driver with symbolically significant negative behavior:
  „Mr. Huber drives an SUV with energy label C with a fuel consumption of 8.4 l/100 km. … In his leisure time, he covers a distance of 11,400 km with his car per year…”

How do you judge the energy consumption of Mr. Huber / Meier with regard to the mobility behavior described above?

Actually higher energy consumption

Actually lower energy consumption
Study 2 – Results

- **No Comparability**: $t(319) = 7.70, p < .001, d = 0.86$
- **Comparability**: $t(161) = 10.03, p < .001, d = 1.11$
Summary

- Evidence for reliance on symbolically significant behaviors
  ⇒ Biased judgments

- Possibility to directly compare the values of two behavioral attributes does not add to judgment accuracy

- Effects persist even if provided with all information necessary to reach a 100 % correct judgment
Implications

- The symbolic significance fallacy probably affects evaluation of one’s own behavior

  ⇒ Showing positive symbolic significant behaviors could result in less attention to other related behavioral aspects

  ⇒ **Legitimization** to behave in less energy-friendly manners with respect to other consumption behaviors
Implications for Interventions

- More attention on symbolically neutral behaviors in communication campaigns
  - Expand focus to different conservation behaviors
  - Emphasize to look at “the whole picture”
Thank you for your attention!

Study 1 – Results – Commuting

- No Comparability (between):
  \[ t(162) = 12.68, p < .001, d = 1.98 \]

- Comparability (within):
  \[ t(81) = 11.05, p < .001, d = 1.73 \]
Study 1 – Results – Room Heating

- No Comparability: 
  \( t(162) = 9.84, p < .001, d = 1.54 \)

- Comparability: 
  \( t(81) = 9.05, p < .001, d = 1.41 \)
Study 1 – Results – Meat Consumption

- No Comparability: $t(162) = 1.91, p = .029^1, d = 0.30$
- Comparability: $t(81) = 3.69, p < .001, d = 0.58$

\[ \text{Energy Consciousness} \]

No Comparability (between)
Comparability (within)

2x a week; Beef
4x a week; Chicken

\[ ^1 \text{one-tailed} \]
Material: Symbolically significant information

- Car driver 1 (Prius driver, 3.9 l/100 km), 28,700 km
  „Mr. Meier drives a Toyota Prius with energy label A with hybrid drive with a fuel consumption of 3.9 l/100 km. Mr. Meier lives in the city and spends his leisure time preferably in nature, in the mountains. In his leisure time, he covers a distance of 28,700 km with his car per year. He uses his car only in his leisure time.”

- Car driver 2 (SUV driver, 8.4 l/100 km), 11,400 km
  „Mr. Huber drives an SUV with energy label C with a fuel consumption of 8.4 l/100 km. … In his leisure time, he covers a distance of 11,400 km with his car per year. …”

How do you judge the energy consumption of Mr. Huber / Meier with regard to the mobility behavior described above?
Material: No symbolically significant information

- Car driver 1 (Prius driver, 3.9 l/100 km), 28,700 km
  "Mr. Meier drives a car with a fuel consumption of **3.9 l/100 km**. Mr. Meier lives in the city and spends his leisure time preferably in nature, in the mountains. In his leisure time, he covers a distance of 28,700 km with his car per year. He uses his car only in his leisure time."

- Car driver 2 (SUV driver, 8.4 l/100 km), 11,400 km
  "Mr. Huber drives a car with a fuel consumption of **8.4 l/100 km**. … In his leisure time, he covers a distance of 11,400 km with his car per year. …"

How do you judge the energy consumption of Mr. Huber / Meier with regard to the mobility behavior described above?

- Actually higher energy consumption
- Actually lower energy consumption
Results

- Car driver 1: 28,700 km
- Car driver 2: 11,400 km

<table>
<thead>
<tr>
<th>Condition</th>
<th>Estimated energy consumption</th>
<th>Test Statistic</th>
<th>p-value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbolic info</td>
<td>4.0</td>
<td>F(1, 504) = 144.32</td>
<td>&lt; .001</td>
<td>d = 1.28</td>
</tr>
<tr>
<td>No symbolic info: Fuel consumption</td>
<td>3.4</td>
<td>F(1, 504) = 19.97</td>
<td>&lt; .001</td>
<td>d = 0.47</td>
</tr>
</tbody>
</table>

- Symbolic info: $F(1, 504) = 144.32, p < .001, d = 1.28$
- No symbolic info: $F(1, 504) = 19.97, p < .001, d = 0.47$