(How) Do Car and Truck Buyers Think about Fuel Economy?

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How soon, in years, would the fuel savings have to pay back the additional cost to persuade you to buy the higher fuel economy option? (ORCI for NREL, 2002. N = 1,000)
Δt : Do we know what this graph means?

• The modal response (27 percent) is, “I don’t know.”
• The question is novel, so people struggle with it.
  • The premise is in conflict with peoples’ conceptions that “economy” cars are inexpensive.
• Not everyone is answering the same question; some respondents are answering the question “how long should it take...?”
How do people answer the question?

1. Technically competent; but still novel
   - A few people, mostly farmers, engineers, and people in the financial services sector discuss simple payback calculations.
   - Able to explain how to calculate simple payback periods and offer some of the variables involved.
   - Mostly “backcasters” and one “forecaster.”
     - Backcasters imagine using their past record of fuel expenditures to calculate the financial value of future fuel economy savings
     - Forecaster attempted to think about the future savings this vehicle would actually accrue
       - DISMAY—what is the future price of gasoline?

   - It is clear that despite knowing how to make such calculations, *none* have ever done so for a vehicle purchase.
How do people answer the question?

2. Really guessing

• Temporal anchors
  • The length of their loan or lease for their most recently financed vehicle
  • The length of time they expect to own the car

• A few offer answers that are vague and flexible.
  • Waiting for us to validate their answer?

• Most were overly optimistic
  “Oh yeah. I’d definitely pay $5,000 more if I was going to get it back in (one, two, three) years.”
How do people answer the question?

3. There has got to be a way to figure this out...

- They just know there is some way to balance the higher vehicle price with the fuel cost savings, but don’t quite know how.

- Some implicitly conclude the right payback period for them is the term of their vehicle financing.
  - “Well, if the savings on gas each month was at least as much as the increase in my monthly payment, then it would be worth it.”

- Most mistakes lead respondents to be overly optimistic about payback periods (too short), and thus have over enthusiastic responses to fuel economy increases.
Hypothetical sub-distributions based on interviews

- Finance Period
- Optimists
- Guessing
- Length of Ownership
- Wrong question
- Magic number

Percent

One Two Three Four Five Six >6 Don't know
I-80 Ecodrive Field Test: Final Results

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Summary

• Energy feedback to drivers appears to produce measurable increases in on-road fuel economy.
  1. We estimate an average 2.7% improvement attributable to eco-driving behaviors, and 2.2% attributable to increased on-road efficiency.
  2. 1.6 to 2.9% average improvement (due to eco-driving) by screen type, but differences between screen types not significant at α = 0.10
  3. Participants’ experiences are complicated—but instructive.
Three Feedback Designs

- Comparison of three feedback designs summarized by NHTSA
- Mid-point of average scales calibrated to households’ vehicles’ combined EPA rating

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<th>Direct Fuel Economy Value, “Numbers”</th>
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<tr>
<td><img src="image" alt="Symbolic “Shrub” representation" /></td>
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<td><img src="image" alt="Acceleration level" /></td>
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Driving Behavior Impacts of Feedback

Behavioral Impacts

- Acceleration rate
- Deceleration rate
- Top speeds
- Median speeds

Overall, Display 1, Display 2, Display 3
Ties to trip types
“I can affect mpg”
City driving: 62%; Freeway: 97%

“In the city, it’s hard to look at it all the time.”

“Maybe if I were taking long trips I could have done better.”
Thematic Structure: Durability of behavior change

- Durability: Will Behavior Change Last?
  - Behavior Will Last
    - New Habit
    - Disinterest
  - Behavior Won't Last
    - Old Habit
    - Reasons to dislike or not use feedback
      - Distracting
      - Not informative
      - Belittling
  - Safety
ACTUAL RESULTS MAY VARY
Why is fuel economy a matter of public policy?

• There are many social benefits to increased fuel economy; there are lots of ways people aren’t thinking about fuel economy as private consumers.

• On-road fuel economy can be improved through changes driver context.
  • Feedback
  • Goal setting
  • Habit formation