



Consumers' Overestimation of Average Fuel-Efficiency and How It Can Lead to Biased Car Choices

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Abstract

Consumers estimate vehicles' fuel efficiency by simply averaging fuel efficiency values in the city and on highways (Study 1). The combined fuel efficiency measure is lower than the simple mean. This might cause consumers to choose less efficient cars as if they were more efficient (Study 2). Replacing or complementing fuel efficiency measure by fuel consumption measure does not fully eliminate the fallacy (Study 3).

Background

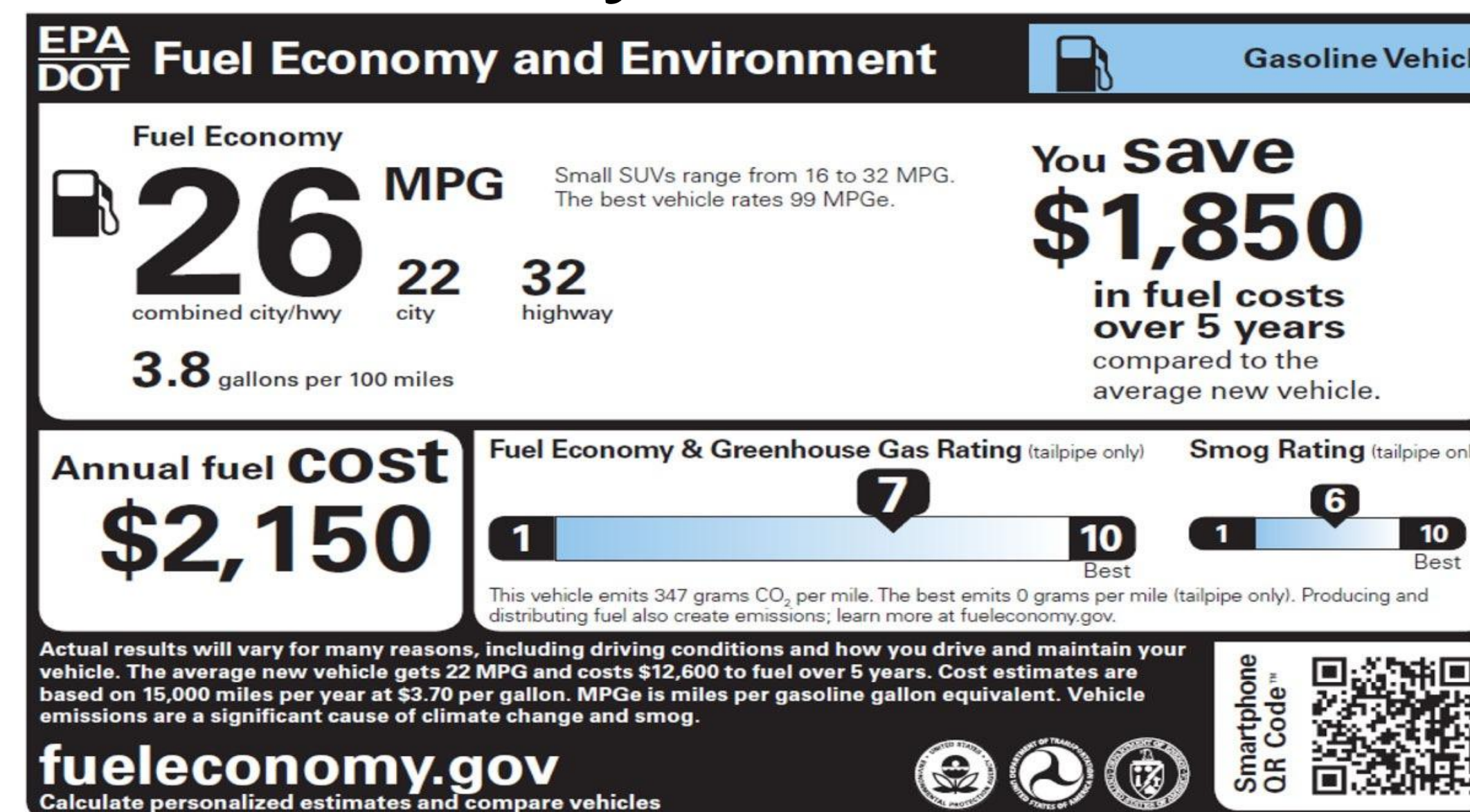
People falsely believe that fuel consumption (e.g., Gallons per 100 Miles, GPM) is a linear function of fuel-efficiency (e.g., Miles per Gallon, MPG) (Larrick & Soll, 2008).

The actual relation is curvilinear, dictating that a "combined" fuel-efficiency measure should give more weight to lower (e.g., city MPG) than high values (highway MPG).

We hypothesize that people will overestimate combined fuel-efficiency measures: Average Fuel-Efficiency Fallacy (AFEF), similar to findings about average speed judgment (Falk et al., 2004).

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Study 1 (N=103)



71% of the participants erroneously thought that the car described in the EPA/DOT label that drives 50% in the city should have a combined MPG of 27, whereas only 14% answer correctly: 26 MPG.

Study 2 (N=484)

Participants were presented with choices between two cars, which are equivalent on all things, except for their fuel-efficiency. In all three pairs the simple city/highway MPGs average led to choosing the less fuel efficient car.

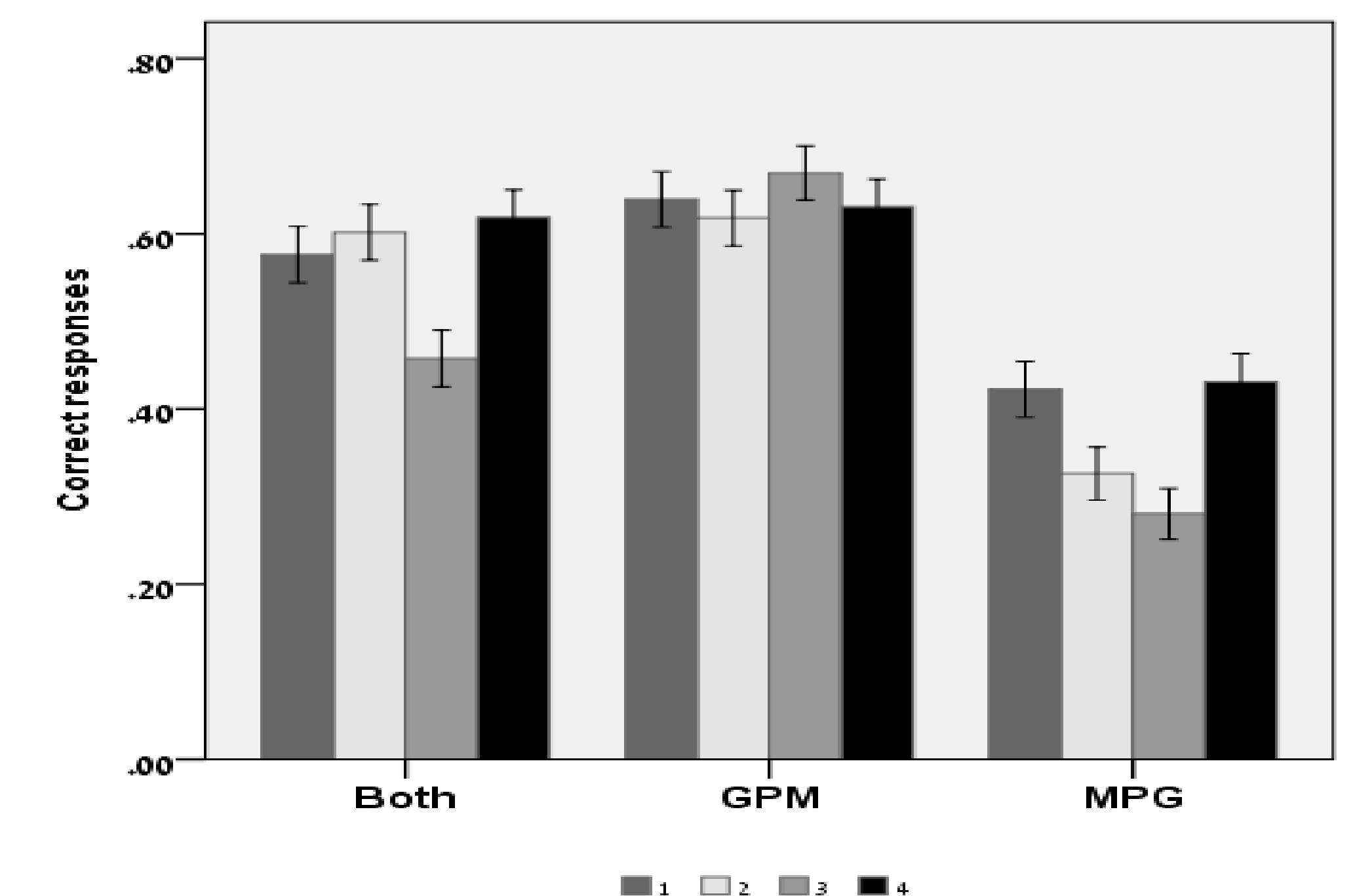
Participants chose the less efficient car in about 70% of the cases.

For example, Car A gets 11 MPG in the city and 24 MPG on highways; car B gets 14 MPG in the city and 19 MPG on highways.

Assuming equal city/highway mileage, simple average implies that Car A is more fuel efficient (17.5 MPG vs. 16.5 MPG), whereas the opposite is true (15 MPG vs. 16 MPG).

Study 3 (N=708)

Replacing or complementing MPG measures with GPM reduced the AFEF.



Conclusions

Consumers overestimate vehicles' fuel efficiency, and might make sub-optimal decisions when choosing between vehicles.

The AFEF can be generalized to other measures of energy efficiency.

Replacing energy efficiency measures with energy consumption measures could "nudge" people to make better judgments and improved energy savings decisions.

References

- Falk, R., Lann, A., & Zamir, S. (2004). Average speed bumps: Four perspectives on averaging speeds. *Chance*, 17(4), 25-32.
- Larrick, R. P., & Soll, J. B. (2008). The MPG illusion. *Science*, 320(5883), 1593-4.