How Uncertainty Affects Demand for Energy-Efficient Technology

SJDM 2020

https://zoom.us/j/7972525301?pwd=Uzh5Q0ZrS3RqakFiMFdQWFg3NHJHdz09

Alanna Sharman & Keri L. Kettle Asper School of Business, University of Manitoba

Abstract

Energy-efficient technology consumes less energy to perform the same task as older technologies (e.g., LED versus incandescent light bulbs), and can thus save money by reducing energy consumption.

Purchasing energy-efficient technology invokes an intertemporal choice, as consumers trade (certain) upfront costs for future (uncertain) cost-savings.

We examine how demand for energy-efficient technology is affected by ***epistemic*** and ***aleatory*** uncertainty about future energy costs and savings.

- ***Epistemic uncertainty*** refers to uncertainty caused by perceived lack of knowledge – the consumer's perception that they do not know something that is knowable (Fox & Ülkümen, 2011).
- ***Aleatory uncertainty*** refers to uncertainty caused by the inherent unpredictability of the future – the consumer's perception that something cannot be known (Fox & Ülkümen, 2011).

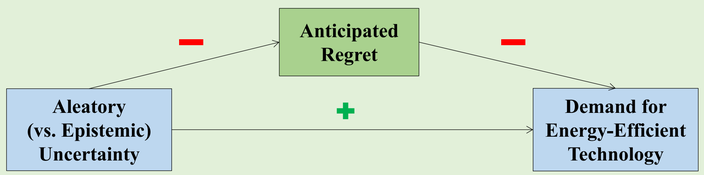
Hypotheses

H1: Emphasizing the unpredictability (predictability) of future costs increases aleatory (epistemic) uncertainty.

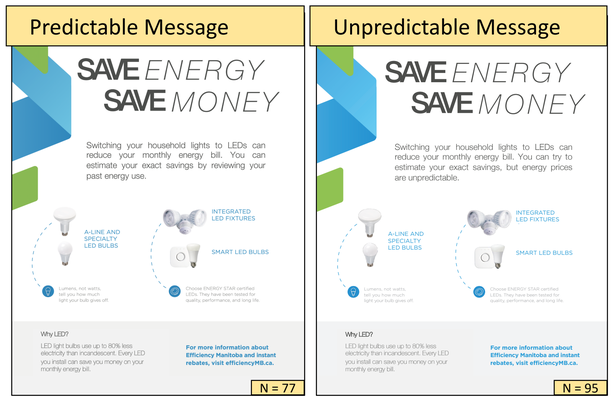
H1a: *Demand for energy-efficient technology is greater when aleatory uncertainty (versus epistemic uncertainty) is experienced.*

H2: *Epistemic uncertainty increases anticipated regret, whereas aleatory uncertainty decreases anticipated regret.*

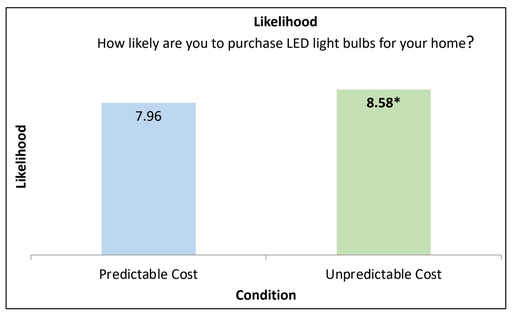
H2b: *Anticipated regret decreases demand for energy-efficient technology*



Study 1



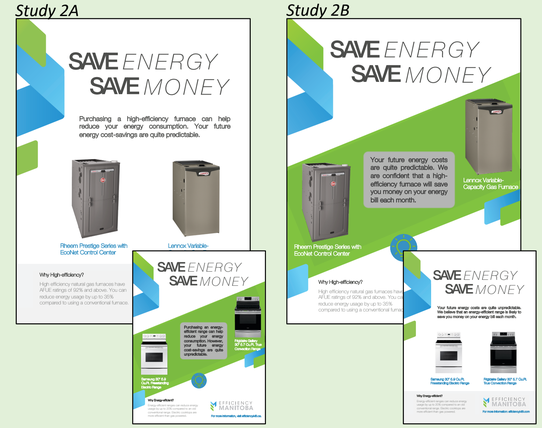
Participants indicated their likelihood of purchasing LED light bulbs for their home (1 = Extremely unlikely, 10 = Extremely likely).



Participants in the unpredictable message condition (M = 8.58, , SD = 1.61) were significantly more likely to consider LED light bulbs than those in the predictable message condition (M = 7.96, SD = 1.97; β = -0.62, *t*(170) = -2.27, p = 0.02).

Study 2A/B

Within-Subject Design (Block on Ad & Product)

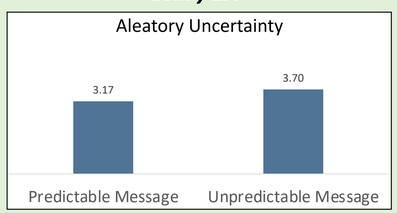


Epistemic – Aleatory Uncertainty Rating Scale

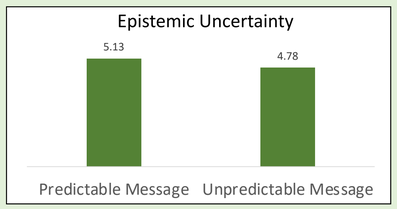
(Fox et al. 2016)

Results

Study 2A

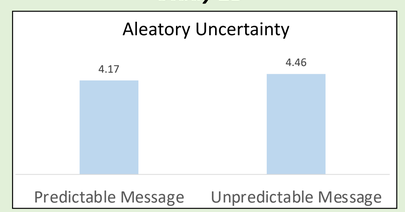


β = 0.50, *t*(416) = 4.18, p < 0.001
($SD_{predictable}$ = 1.35, $SD_{unpredictable}$ = 1.52)

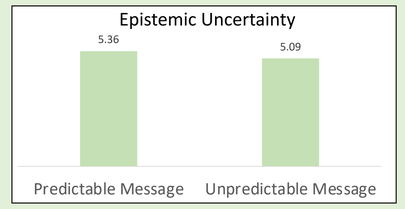


β = -0.32, *t*(416) = -3.04, p = 0.003
($SD_{predictable}$ = 1.08, $SD_{unpredictable}$ = 1.33)

Study 2B



β = 0.29, *t*(176) = 2.33, p = 0.021
($SD_{predictable}$ = 1.80, $SD_{unpredictable}$ = 1.65)



β = -0.27, *t*(176) = -2.25, p = 0.026
($SD_{predictable}$ = 1.30, $SD_{unpredictable}$ = 1.31)

Resource:
Fox, C. R., & Ülkümen, G. (2011). Distinguishing Two Dimensions of Uncertainty. Burn, W., Keren, G., Kirkeben, G., & Montgomery, H, eds. *Perspectives on Thinking, Judging, and Decision Making: A Tribute to Karl Halvor Teigen* (Universitetsforlaget, Oslo, Norway), 21-35.
Fox, C.R., Tannenbaum D., & Ülkümen, G. (2016). The Empirical Case for Distinguishing Two Dimensions of Subjective Uncertainty. Working paper, University of California, Los Angeles, California.

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