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# Temporal Framing, Endowment, and Energy Choices

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## Abstract

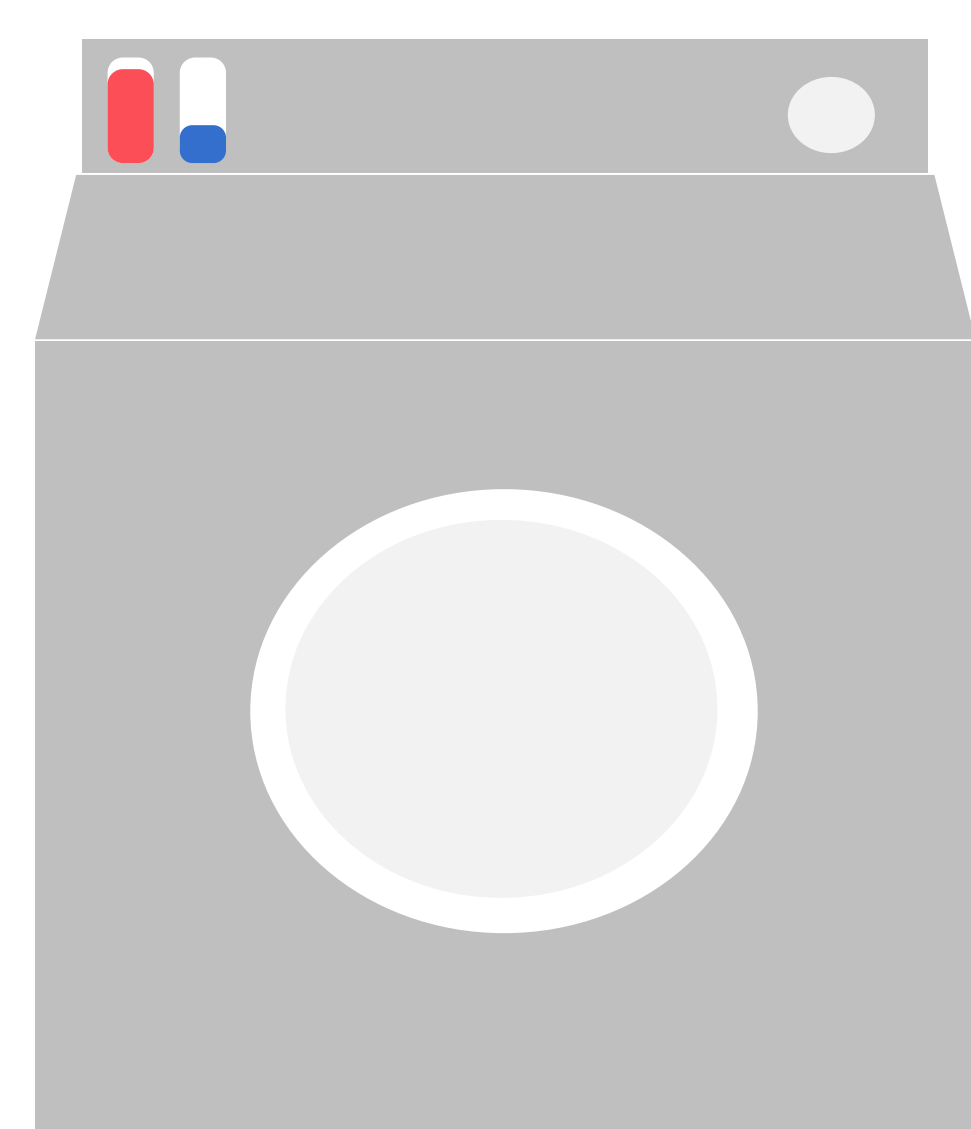
One challenge of promoting energy-efficient behavior is that it requires change. Limiting energy use often requires sacrificing convenience and comfort now and in the future.

Using experimental data, we explore what temporal frame (daily, monthly, or yearly) neutralizes loss aversion and encourages energy-efficient choices.

Results suggest consumers are most willing to adopt energy efficiency when cost savings are framed on a monthly basis.

We explore why the endowment effect diminishes in the monthly frame, and in particular note that fluency is the highest in the monthly frequency frame.

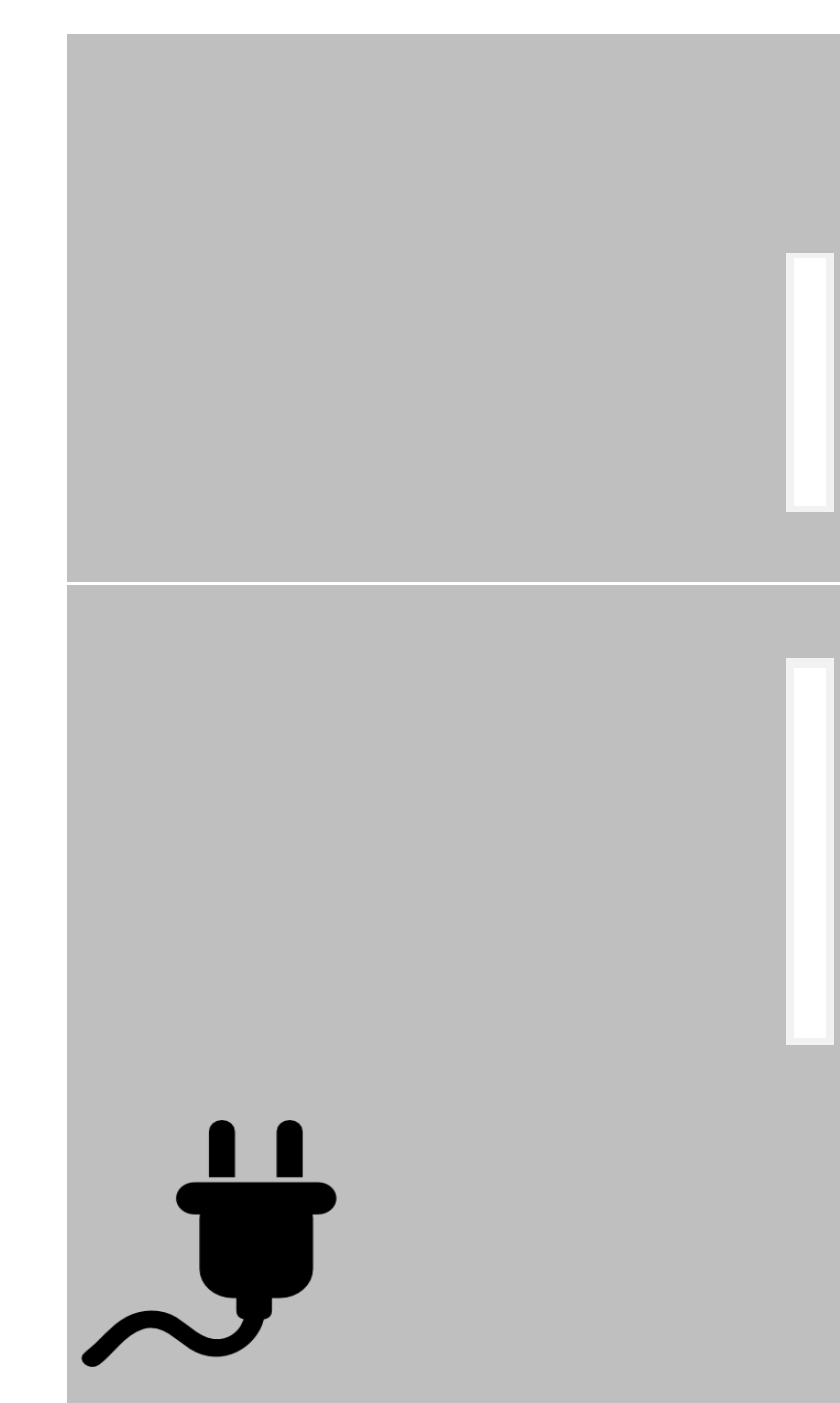
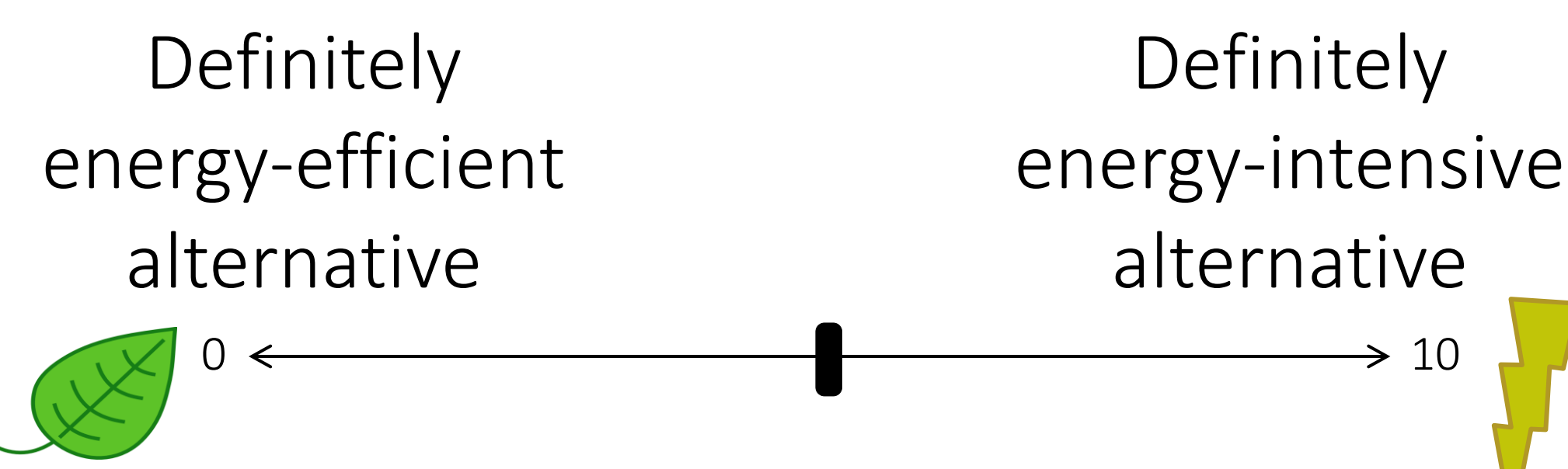
## Survey



**S1: Use cold laundry water**  
\$63 annual estimated savings

Would you switch from an energy-intensive habit to an energy-efficient habit if it saved you...

\$0.25 per day?  
\$7.63 per month?  
\$91.50 per year?



**S2: Unplug second refrigerator**  
\$120 annual estimated savings

We presented participants with hypothetical energy scenarios. We randomly assigned status quo behavior costs/savings frequency.

3 (frequency) x 2 (frame) between subjects design  
N = 353 responses from Amazon MTurk

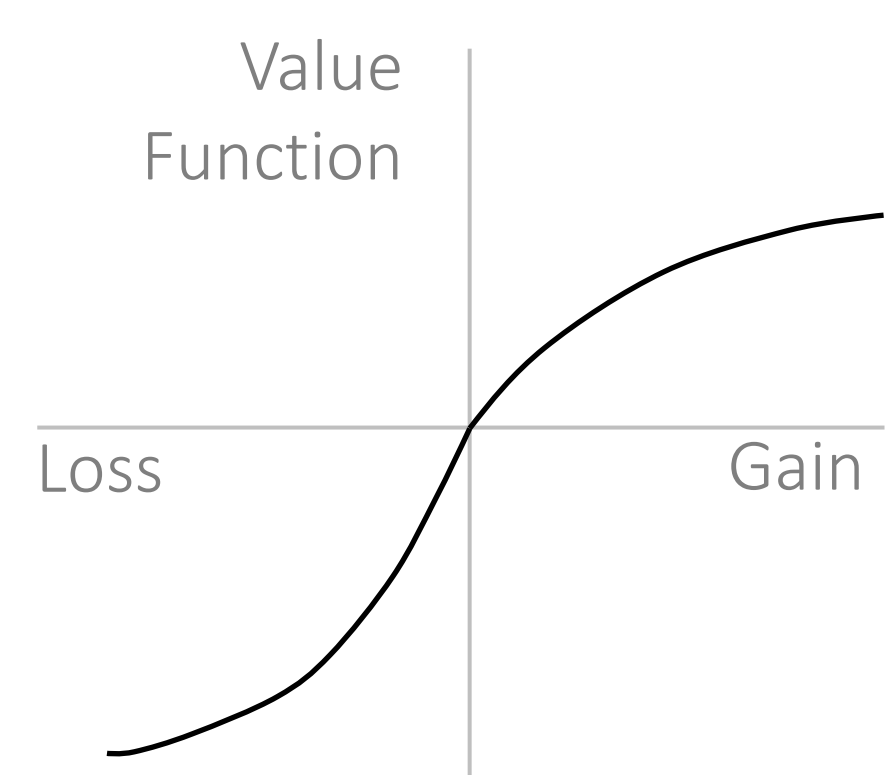
## Background

### Loss aversion for comfort

Defaults are sticky [5]. Consumers keep a contractor's arbitrary light bulb choice, despite zero switching cost and the potential for monetary savings [2].

Switching from energy-intensive to efficient behaviors, consumers lose comfort and convenience [3].

Under Prospect Theory, consumers prefer to segregate savings and integrate costs [6].



Status Quo Behavior	Proposed Impact to Comfort/Convenience	Proposed Impact to Energy Bill
energy efficiency	gain	added costs
energy intensity	loss	savings

### Pennies-a-day (PAD)

However, consumers tend to neglect small recurring costs [1]. Do consumers similarly neglect small recurring savings or small non-monetary consequences?

Save \$0.25 per day by choosing the energy-efficient alternative.

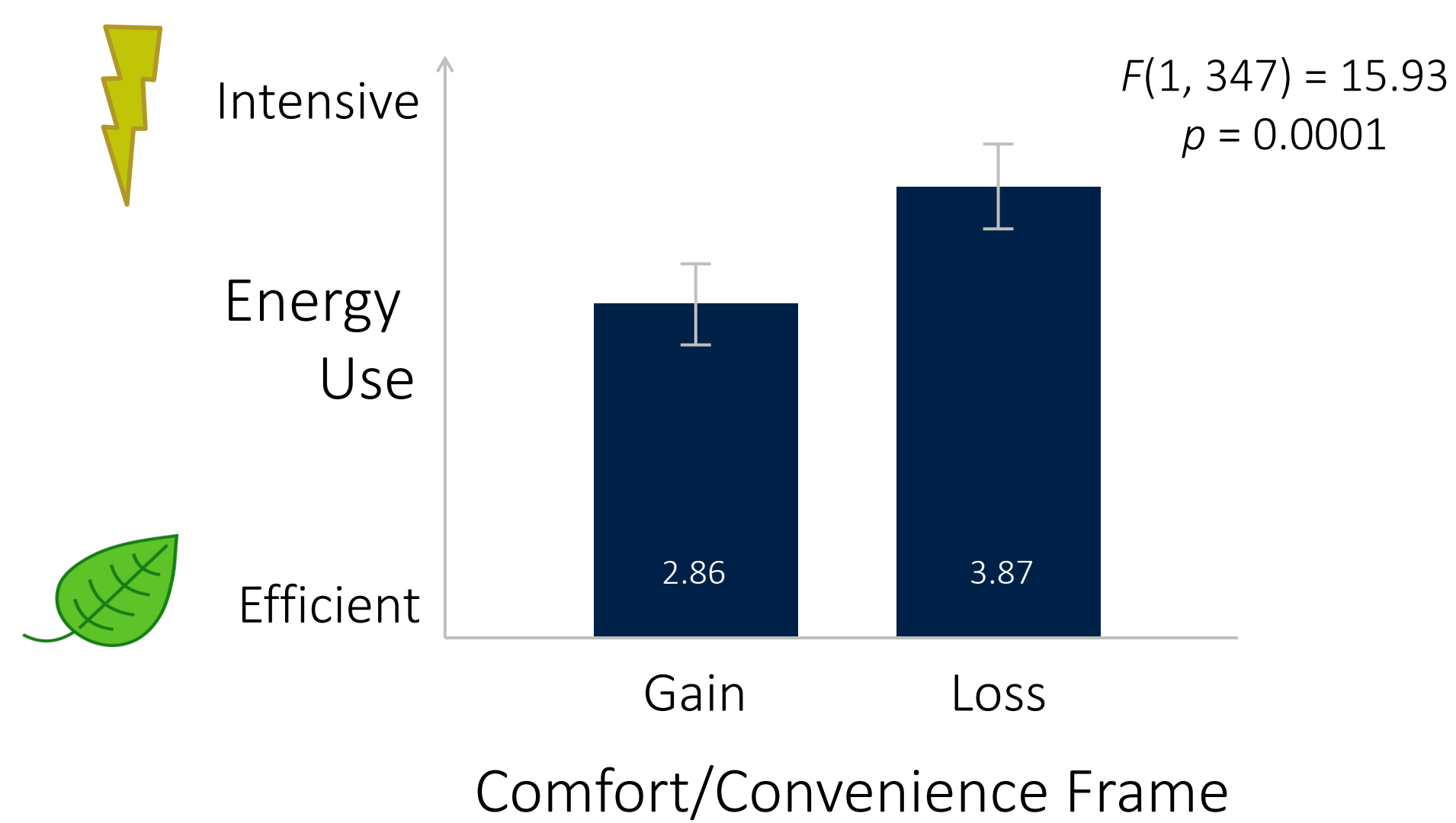
Pay an additional \$92 per year to choose the energy-intensive alternative.

### Boundaries of Loss Aversion

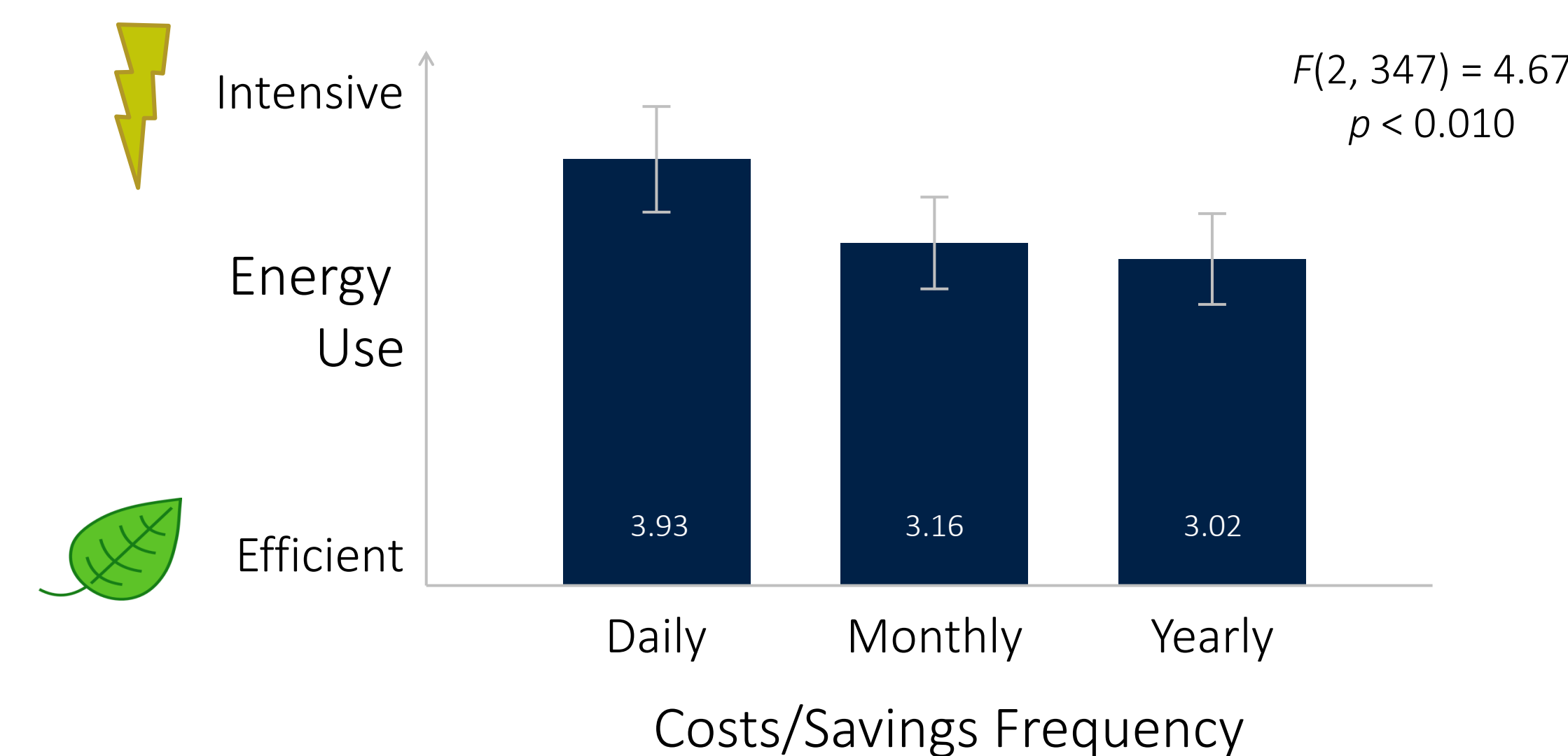
Consumers experience decreased loss aversion for money they plan on spending [4]. Can we align their energy decisions with their budgets to reduce loss aversion?

## Findings

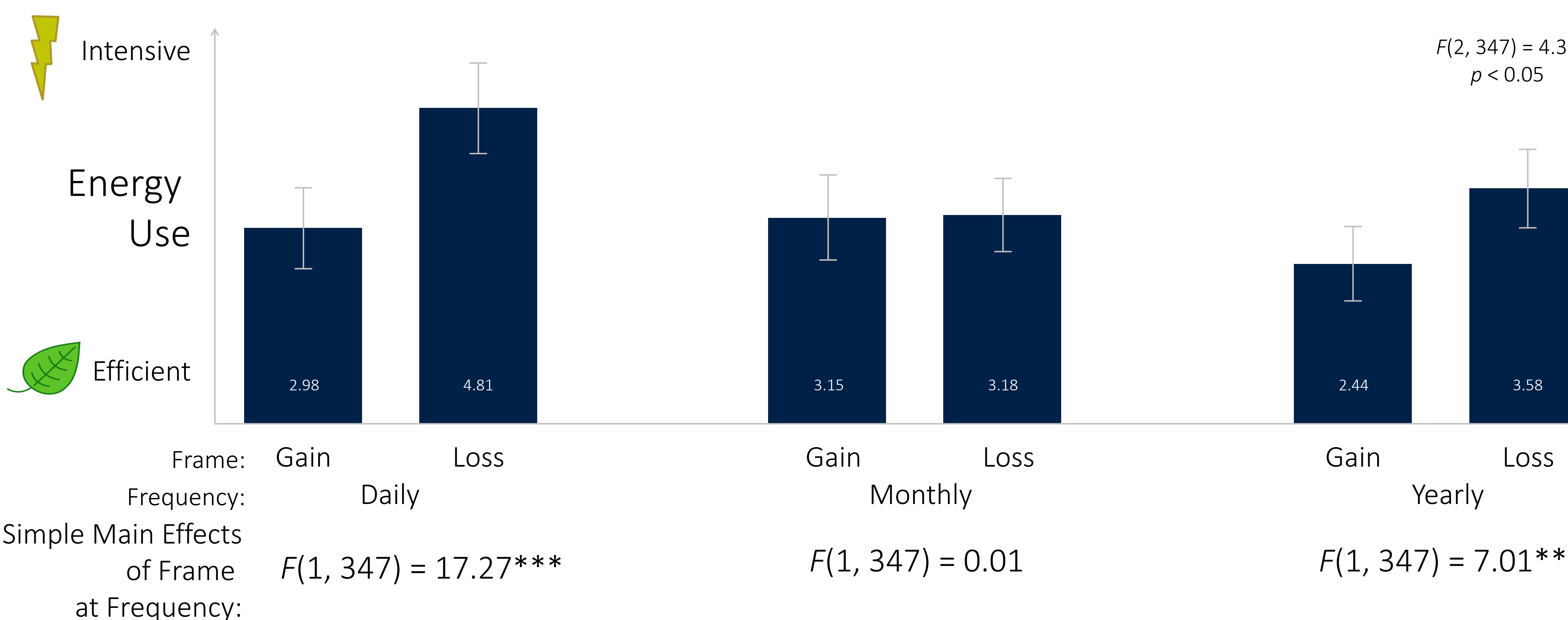
### Defaults are persuasive



### Neglect for small recurring savings



## A boundary of loss aversion for energy decisions



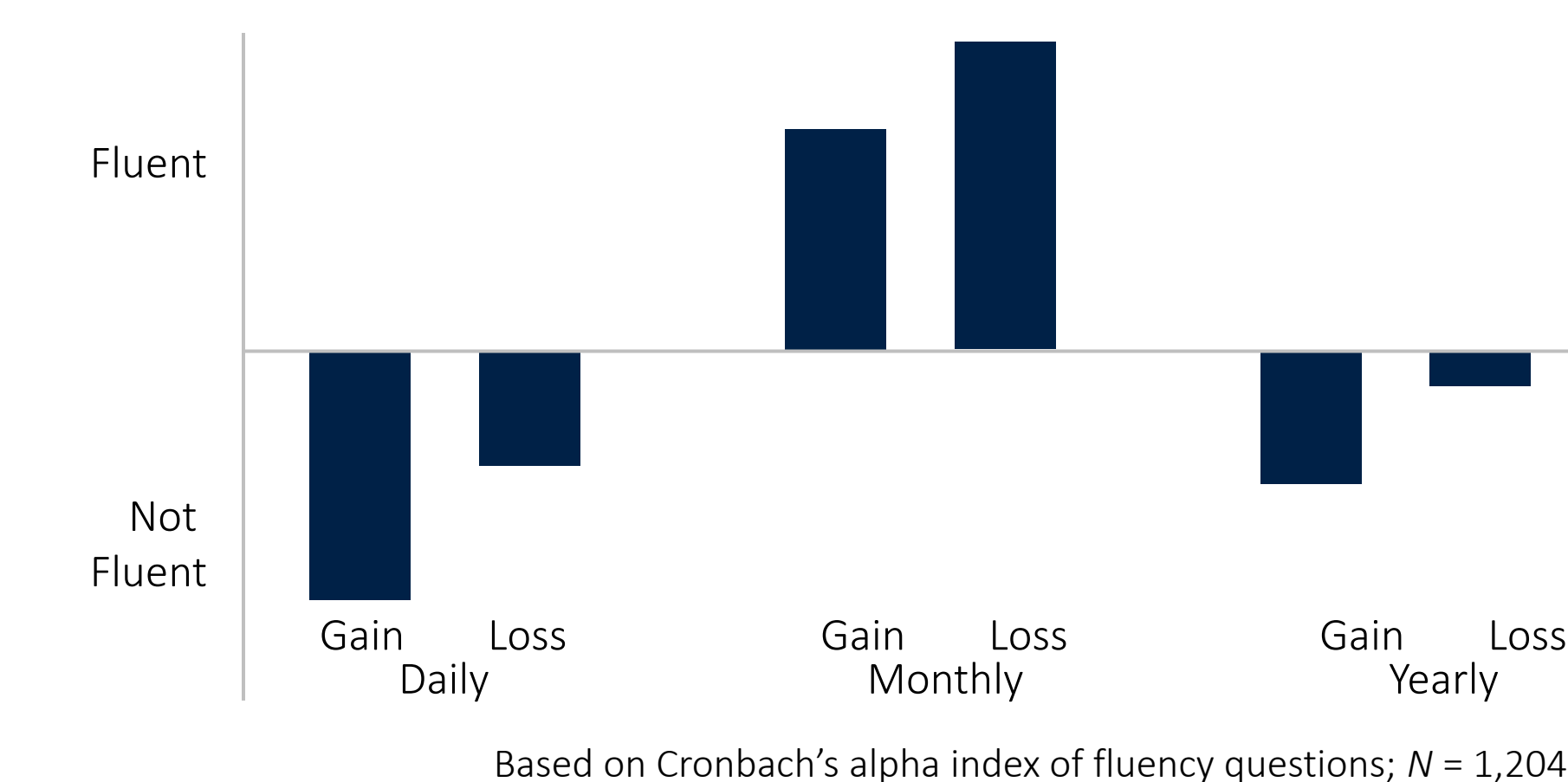
\*\*\* and \*\* indicate significance at the 1% and 5% levels, respectively, using the per family error rate.

Status quo affects daily and yearly energy use, but not monthly use.

## Discussion

### What's special about monthly?

Are consumers more familiar with monthly energy costs/savings? Preliminary evidence from a second study supports greater fluency with monthly frame:



### Coefficient of loss aversion

We find neither a main effect or interaction between the loss aversion coefficient and frame.

### Environmental concern

Environmental concern is significant but does not interact with the treatment or affect findings.

### Other controls

Main findings persist even when including control variables for typical energy bill cost, actual frequency of engaging in these behaviors, and construal level.

### Discomfort

Perceived discomfort/inconvenience may be a possible mediator for frequency.

## Managerial Implications

Efficiency advocates and energy managers should consider messaging with monthly savings. Simple messaging may help reduce resistance to adopting energy-efficient behaviors.

## Future Research

- Validate findings using Qualtrics participants
- Further explore fluency as a mediator
- Examine other approaches to reducing loss aversion through fluency, e.g. percent savings

## Acknowledgments

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## Select References

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