



Information Salience and Behavior Change in Solar: Three Experiments

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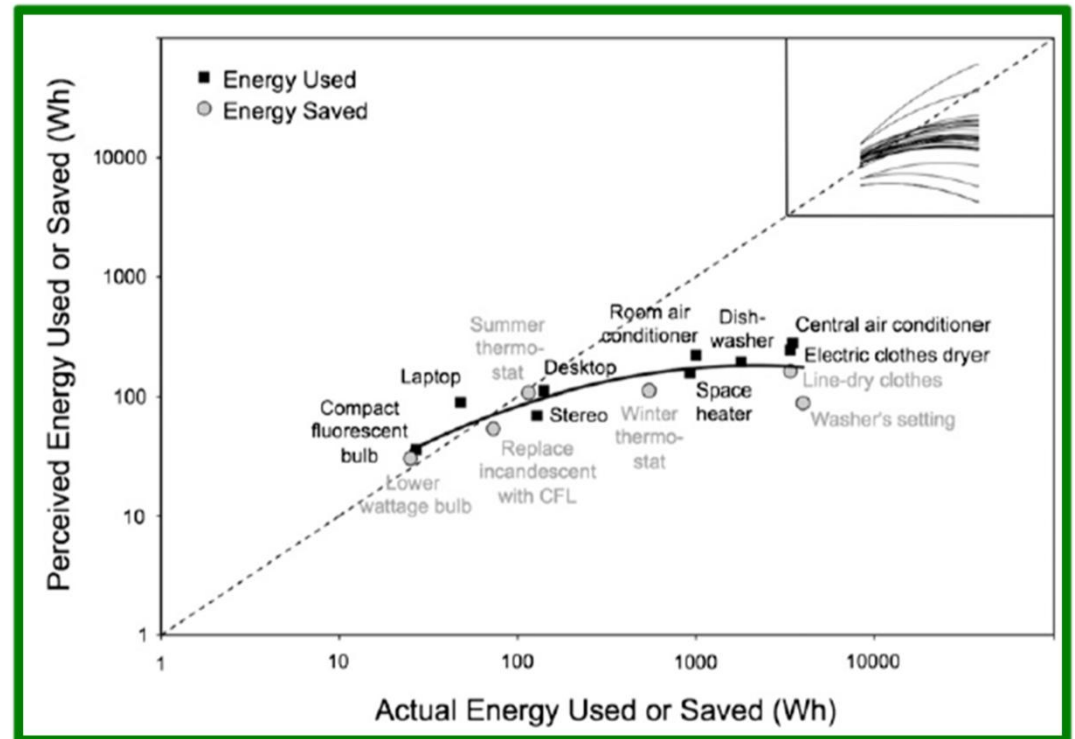


Owing to various biases, information is received, accessed, and perceived subjectively

- Trust-based networks
- Confirmation bias
- **Ostrich effect**



- **Anchoring**



Source: Attari et al., *PNAS* (2010).

Karlsson, Loewenstein, & Seppi, *Journal of Risk and Uncertainty* (2009).

Your Guide To
PUC's Energy Program Reform

Are you a current PV solar user?
 YES: No Worries, Grandpa!
 NO: Don't worry, grandpa! If you're not a current PV solar user, you'll still be able to take advantage of the new program changes.

Are you interested in going solar?
 YES: Call Alternate Energy (808) 842-5853. We'll work to get you the best solution!
 NO: R-O-Why Not? (R-O-Why Not? HI: 12-15% R-AP: 10% 1 YR CD: 2%) Solar isn't a one-size-fits-all investment. Based on your roof to PV, we'll help you decide if it's the right fit for your system.

Are you interested in adding capacity?
 YES: Call Alternate Energy (808) 842-5853. We'll work to get you the best solution!
 NO: No Worries, Grandpa!

Call the experts at Alternate Energy. THE FUTURE OF HAWAII'S ROOFTOP SOLAR. There are two new options for customers who wish to invest in solar & help Hawaii towards 100% renewable energy.

SELF SUPPLY SYSTEMS OR GRID SUPPLY SYSTEMS

YOU:
 • Consume all your solar energy onsite at your home or business.
 • Do not need to export excess energy to the grid.

YOU:
 • Will receive monthly energy credits similar to the NEM program.
 • Want to export excess energy to the grid.

NO CAP
 At this time there is no cap on the number of Self-Supply systems that may be installed.

CAP
 This program is limited to 25 megawatts (MW) of interconnect. Check this, this program will close.

HOW IT WORKS
 • These systems are designed to use energy management and storage systems to balance generation with demand.
 • They have reduced technical requirements and require expedited interconnection review.

Don't wait, act now!
 The estimated end date for this program is 6-8 months.

HOW DOES IT COMPARE?

Metric	Present	Compare	Future
NUMBER OF HOMES	10	14	2,600
SAFETY	4	8.5	12%
RETURN ON INVESTMENT	10%	12%	12%

MID-DAY SOLAR USAGE COSTS LESS

The New TIME-OF-USE TARIFF
 The PUC has directed HECO to develop a new time-of-use rate that will allow customers to save money by shifting energy demand to the middle of the day.

100% Renewable Energy

The Aloha State is still the leader in Solar Energy

12-15% ROI

Alternate Energy
Renewable Energy for our future

For more information call 808-842-5853 or request a free quote online at www.AlternateEnergyHawaii.com

Where are we now?

- Typical outreach through
 - Utilities
 - Bill inserts
 - Infographics
- How effective?
 - Salience

Austin Energy

Solar Photovoltaics (PV) Incentive



Let us help you pay for a new solar PV energy system for your home.

Austin Energy offers incentives for customers who purchase and install solar PV systems for their homes.

Find a Contractor to get started.

[Get Started](#)

Description | [Incentive](#) | [Eligibility](#) | [Process](#) | [Find a Contractor](#)

Solar PV systems are clean, quiet, and efficient ways of generating electricity at your home. They harvest sunlight and turn it into electricity.

Why Games?

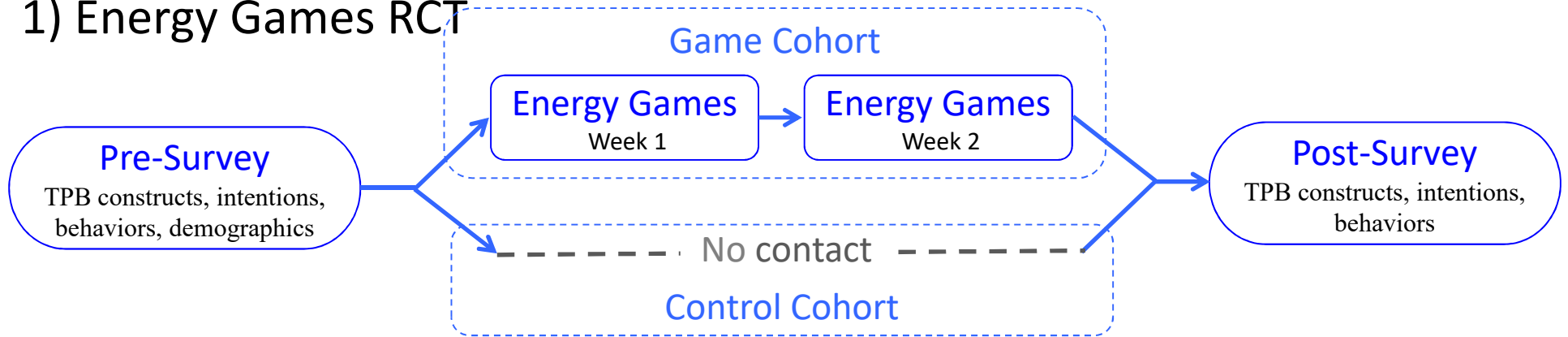
- Do games have **greater impact than traditional** forms of information?
 - **Yup!**
- Through which **behavioral channels**?
 - **Agency, intention**
- Does **frequency/amount of content** per communication matter?
 - **Sure does!**
- *Information objectives*
 - *Basic objective information*
 - *Reduced information search costs*
 - *Confronting misperceptions*



“Serious Games”: Games with primary purpose other than entertainment

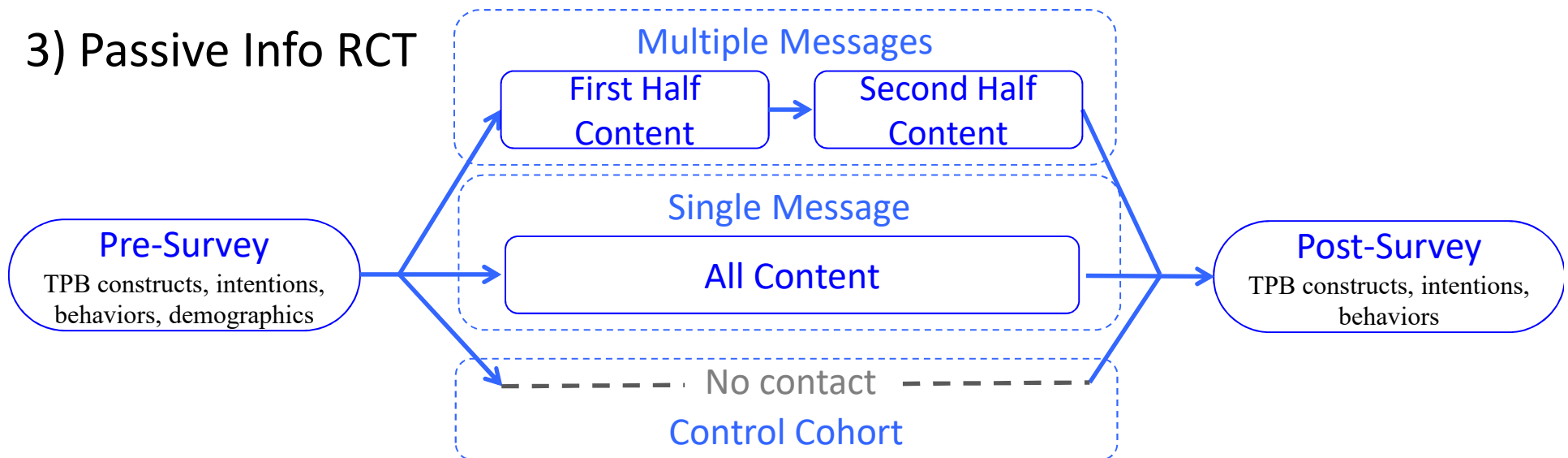
Three Experiments

1) Energy Games RCT

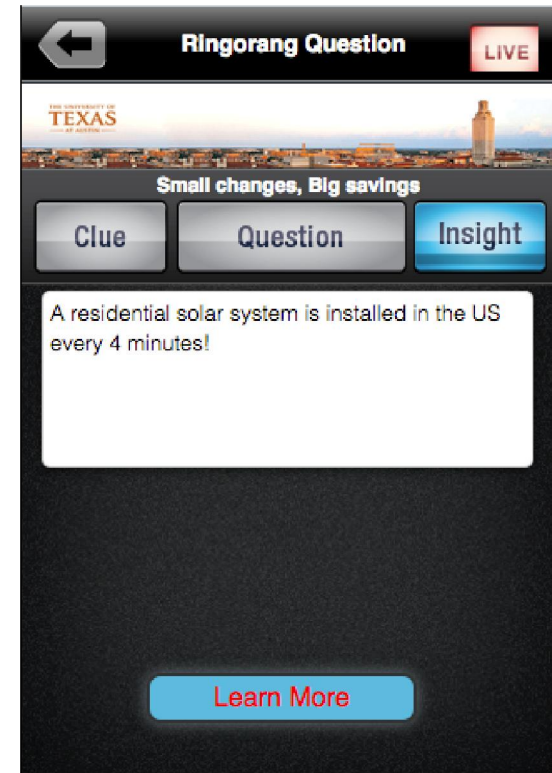
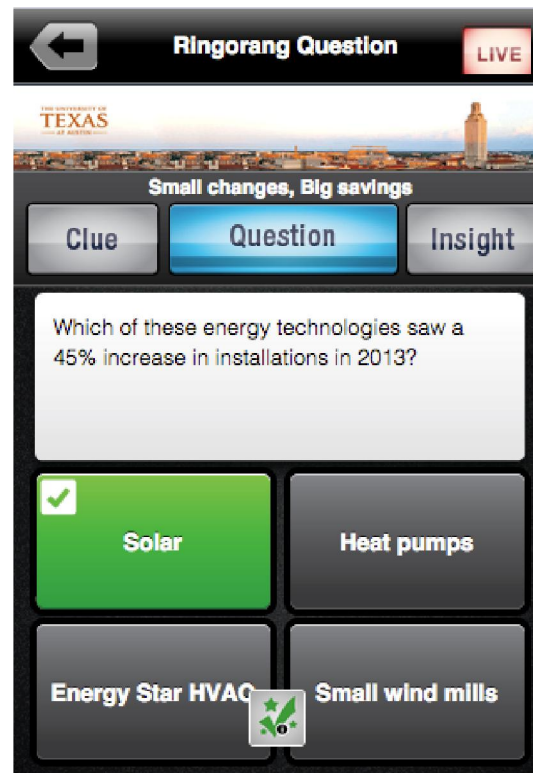
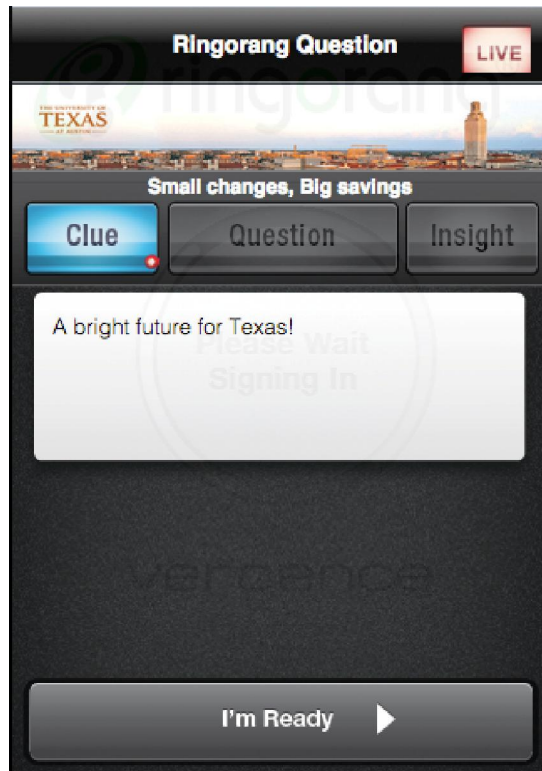


2) Energy Games within subjects (no control cohort)

3) Passive Info RCT



Game Platform: Ringorang[®]

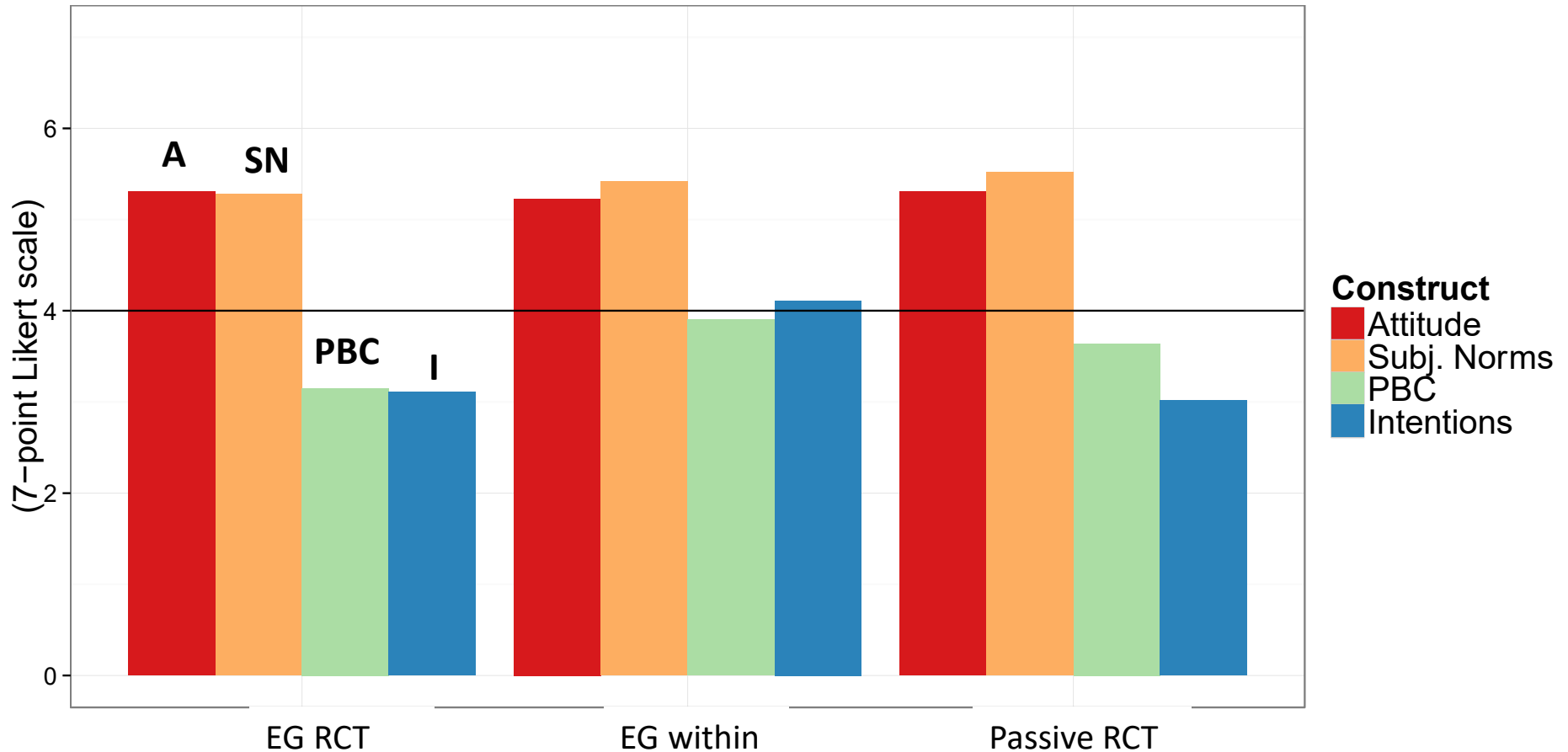


- Question conveys actionable or educational information
- An *insight* provides more context or information
- **< 1min**
- Not too complex
 - Points, Leaderboard, Prize drawing
- Easy learning curve
- Minimizes confounding factors

Survey Topics: Solar Measures

- Attitude
 - General appeal, *financial outcome*, *impact on home value*, visual appeal, *environmental benefit*, and maintenance
- Subjective norms
 - *People who are important to me would approve*
 - Most people who are important to me would support my installing solar.
- Perceived Behavioral Control (PBC)
 - Ease of installation, *affordability*, knowing what steps to take, available time
- Intention
 - *How likely is it that you will request a quote for a solar installation some time in the near future (within the next few months)?*

Pre-treatment Survey TPB Metrics



- PBC and intentions low (below neutral of 4)
- Solar perceived as “unaffordable” indicates anchoring
- PBC key factor to impact

Results: TPB Constructs

	PBC ↑	Incentive Awareness ↑
EG RCT: game to control	d = 0.71	Δ = 20%
EG within subjects	d = 0.66	No change
Passive: Multi to control	d = 0.33	Δ = 14%
Passive: Multi to single	d = 0.26	No change
Passive: Single to control	No change	No change

- **Repeatability** of Energy Games (similar effect size, d)
- PBC and incentive awareness **consistently effected**
 - But not for single message condition
 - **Effect 2x for Energy Games** compared to multi message

Effect size – Cohen's d

Two-way repeated measures ANOVA

Results: Intentions

Intentions↑

EG RCT: game to control	$d = 0.49$
EG within subjects	$d = 0.63$
Passive: Multi to control	$d = 0.36$
Passive: Multi to single	No change
Passive: Single to control	$d = 0.28$

- **Repeatability** of Energy Games (similar effect size, d)
- Multi and Single have comparable impact on intentions
- **Energy Games consistently higher effect size**

Effect size – Cohen's d

Two-way repeated measures ANOVA

The University of Texas at Austin

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Key Insights

- Higher frequency, smaller bits of information
 - Energy Games extreme end of modularity
 - Games as cohesive experience may slow fatigue
- Interactive nature tests perceived knowledge
 - Need to “encounter” information to address confirmation bias
 - More “aha” moments → Higher PBC to correct misplaced anchor points
- Simple (but serious!) games could help “activate” passive potential customer base

What Next?

- What is the **durability** of the impact on antecedents?
- What are the long-term impacts (over several months) of the information modes on **solar adoption behavior**?
- Optimal **quantity, frequency, and content** of to maximize engagement and reduce audience fatigue?
- Does the mode of information delivery affect the likelihood of **independent information search**?

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 - Project design
 - Outreach and participant recruitment AEP
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