Hug, Nudge, Shove or Smack?

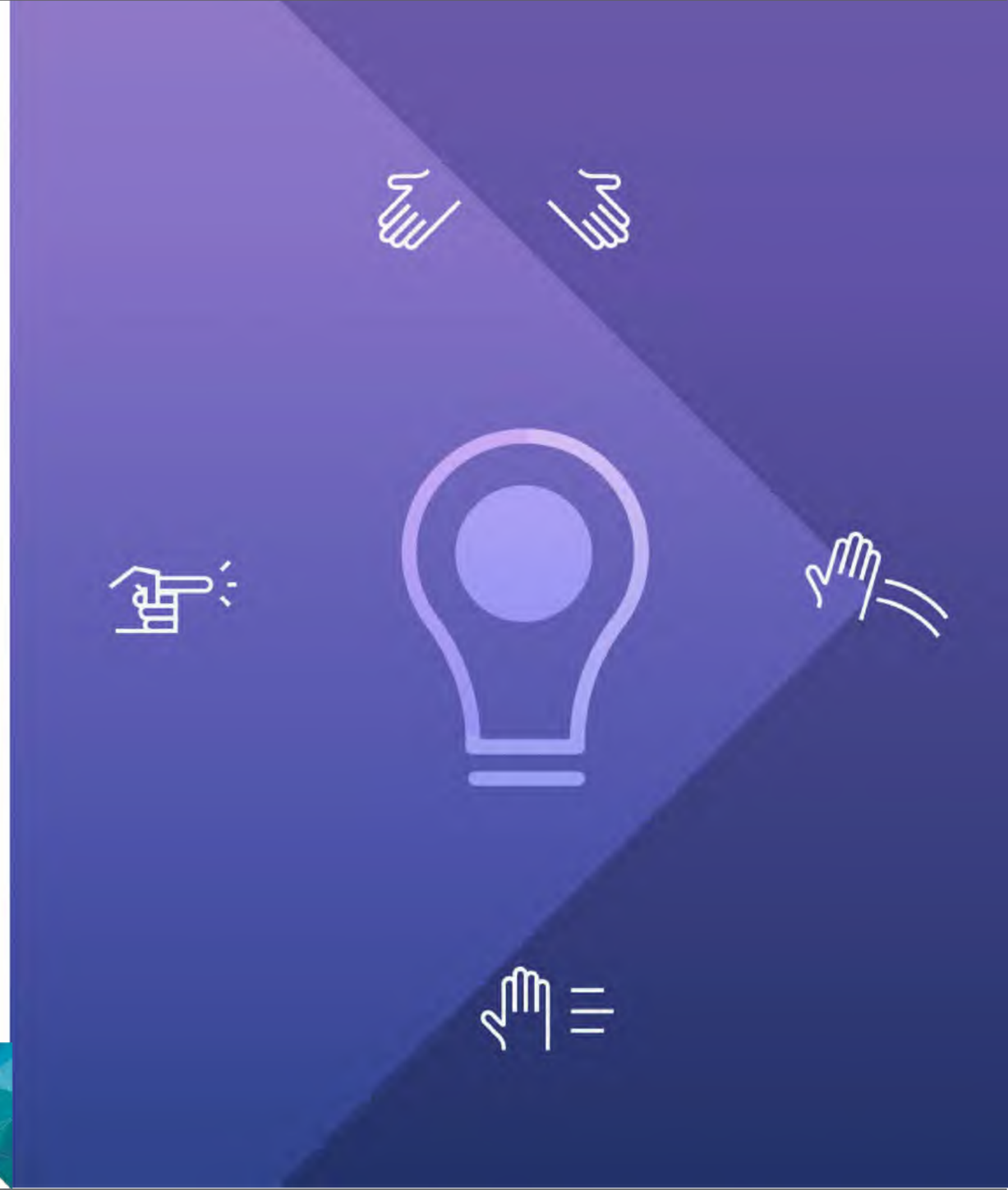
Testing approaches to enabling consumer energy use behaviour change

Final Presentation

Professor Uwe Dulleck &
Professor Rebekah Russell-Bennett

The Queensland Behavioural Economics Group (QuBE) &

Service Thinking for Social Problems



Funded by

Energy Consumers Australia

QUT Business School

Who we are

Professor Uwe Dulleck

Behavioural Economics
Professor of Economics, QUT
Qld Behavioural Economics Group (QuBE)
Hon. Professor of Behavioural Economics,
Crawford School of Public Policy ANU

Professor Rebekah Russell-Bennett

Social Marketing and Consumer
Psychology Professor of Marketing
QUT Business School
Adjunct Professor,
National University of Ireland, Galway
steering Committee Member, GEER

Agenda

& Purpose of the Session

1.00 - 1.10 Introductions

1.10 - 2.00 Background to the Project

2.00 - 3.00 Results & Interactive Discussion

The Discussions from this session will help guide the Final Report

Moving Forward

Please take notes during the session and we will collect at the end of the session

Virtual attendees please share your thoughts via chat or during questions at the end

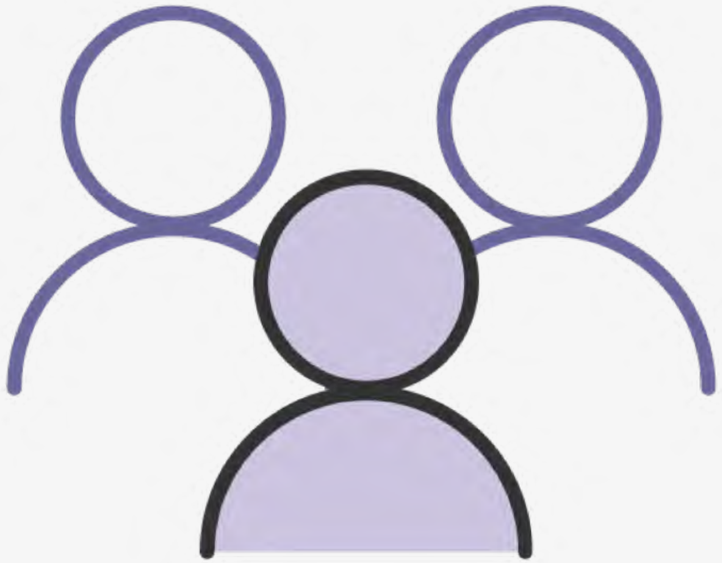
What did you find most interesting or surprising?

What would you like to see highlighted in the report?

What are the policy implications of these findings?

Introductions

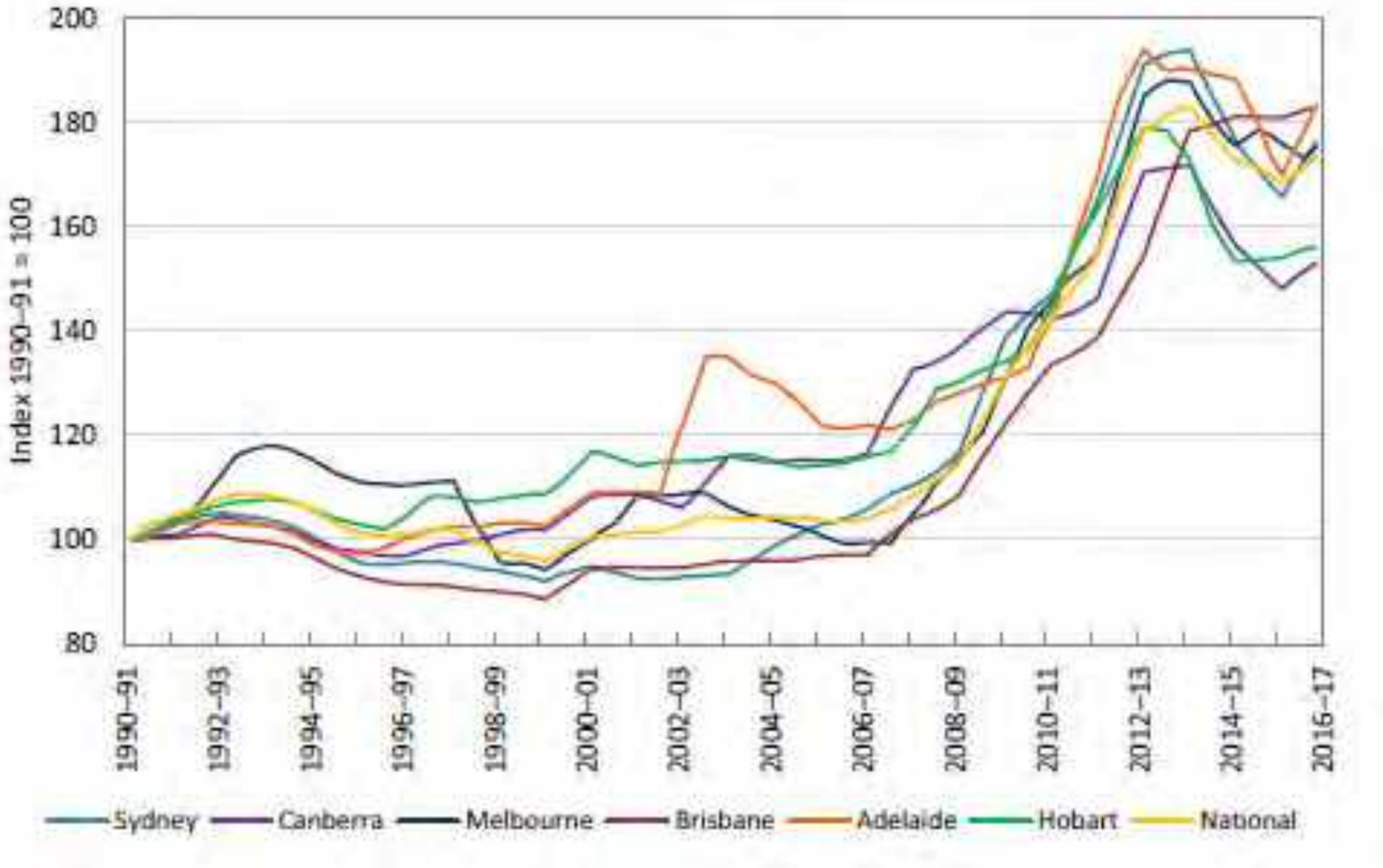
Who is in the room and online?



Background to the Project

Electricity pricing and consumers

- Electricity prices are increasing
- There is increased pressure on vulnerable consumers
- We can either influence the demand or the supply side



Source: Data from ABS, Graph from ACCC: *Retail Electricity Pricing Inquiry – Preliminary Report*, 22 September 2017

How to influence the demand side when electricity is invisible to consumers?

There is evidence that much electricity consumption takes place without any conscious consideration of consumers usage (Thøgersen & Grønhøj, 2010; Pierce, Schiano, & Paulos, 2010).

It is bound up with routine and habit (Shove, 2003).

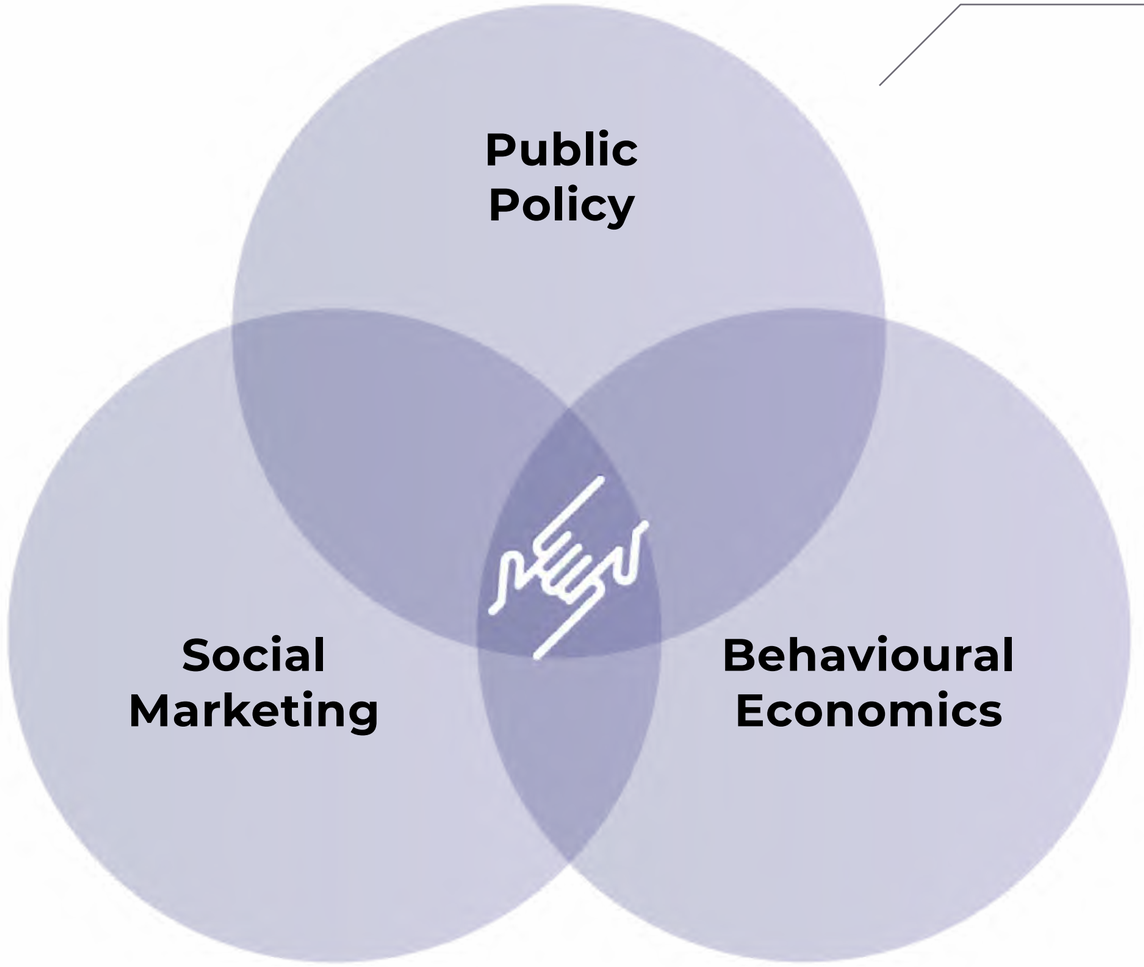
Electricity is ‘abstract, invisible and untouchable’ (Fischer, 2008).

It is considered a low-involvement product (Yam, Russell-Bennett, Foth, & Mulcahy, 2017).

Consumer Habits & Decision-making

Background Literature

Social Marketing (AASM, 2013) Social Marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good.



Public Policy (Hertier & Lehmkuhl, 2008): Hierarchical: "Legislative decisions and executive decisions that steer democratic governmental action at the national level… legislators can threaten to enact adverse legislation unless potentially affected actors alter their behaviour to accommodate the legislators demands".

Behavioural Economics (Thaler and Sunstein, 2009): studies effects of psychological, social, cognitive, and emotional factors on economic decisions, provides important insights into how people make choices. Contrasts this with normative insights from economics.

Social Marketing:

Insights

Temporal orientation
Consumers are more motivated by short-term, self-oriented options than long-term and altruistic

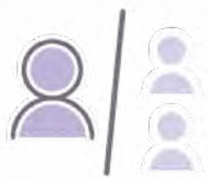
Pleasure principle
Consumers act to minimise pain and maximise pleasure

Social orientation
Individuals do not act alone - homo sociologicus

Knowledge-action gap
More education does not equal more action

Consumer empowerment
Consumers need to feel in control

Value-orientation
Consumers make choices that deliver them value- their definition of value not ours



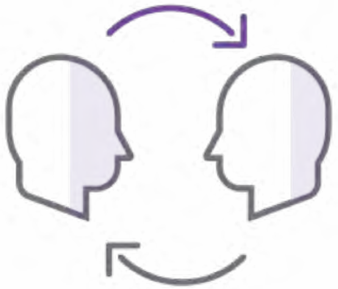
Segmentation
Consumer choice goals and choice processes differ by household and by individual

Behavioural Economics:

Insights

Framing Matters
Losses (penalties) are treated differently from gains (subsidies) triggered by an action, even if the final outcome is the same.

Defaults Matters
Decision makers tend to make ‘errors of omission’ more often than ‘errors of commission’

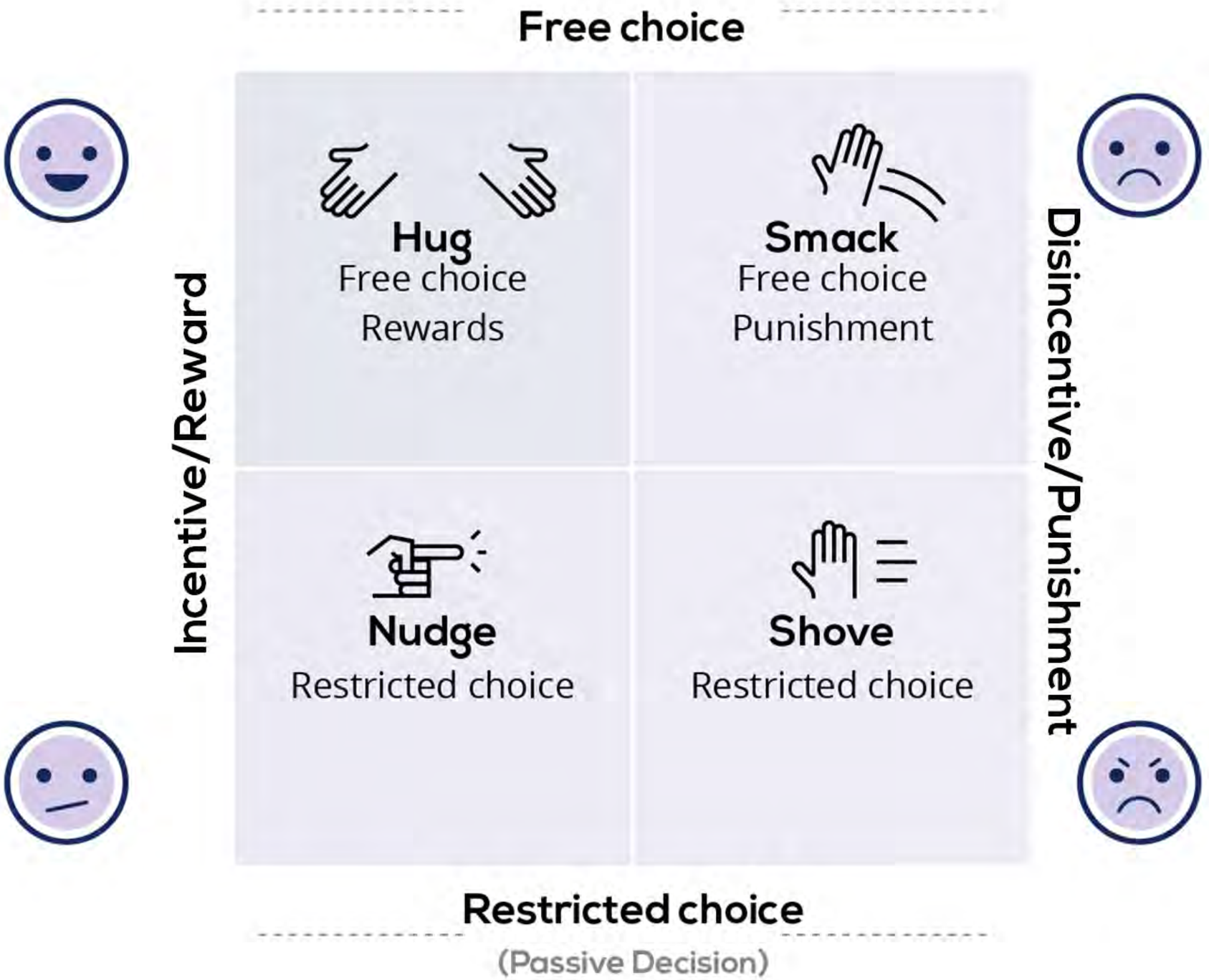


Reciprocity
If an action is perceived as positive, such as a subsidy, or negative, such as a penalty or a limitation of choices available, it will trigger different behaviours

4 Policy levers

(French, 2011)

Choice
(restricted/free)
and
Outcome
(reward/punishment)



Context: Peak Usage

Problem:

- The network is built for the extremes of electricity use - costly
- Peaks and surges on the network - strain, potential brownouts/blackouts, whip effect

Event days
Electricity load is time-shifted or reduced

Demand Control
One solution is demand control

Network controlled v customer-controlled

State of play:
Networks are offering demand control programs but there is low awareness and adoption

Research Questions

What we know

The four policy levers can be successful at affecting behaviour change in electricity

Consumers are not adopting or responding well to demand control offers

What we don't know

What is the effect of each policy lever for consumer change on event days?

Research Questions

RQ1: How do consumers respond to each of the four policy levers for demand control?

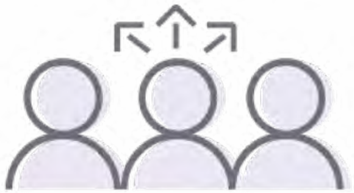
RQ2: How does the initial effect decay over time for each lever?

RQ3: What are the individual differences that influence consumer responses to the levers?

Electricity usage is a social dilemma

A ‘public good’ social dilemma is where an individual must decide whether to contribute to a common resource (Dawes, 1980).

Individual choices generally are made based on intuitive and implicit judgments concerning short-term and long-term benefits, and the many competitive options available (Rothschild, 2001).



Prosocial Personalities influence behaviour (Penner *et al.*, 2005). Prosocial Propensity, refers to the individuals predisposition to engage with prosocial behaviour.

On an event day:
the Consumer must decide; Will I reduce my own consumption, incurring a personal cost, to contribute to a common resource or will I take what I want (Dawes, 1980).

What is a public good game?

Terminology

Endowment
refers to the sum of 10 tokens each player is given to use during each round

Cooperating
high contributions to the public good correspond to acting pro-environmentally, and in turn reduced electricity consumption

Contribution
directly translates as electricity consumption behaviour

Achieving high levels of contribution by the group is considered co-operation. High levels of cooperation are the ultimate goal of the public good game.

Stages

1. Lab experiment

Students

General electricity use context

2. Lab experiment

General public

Peak usage on event day

3. Future projects

Field experiment

General public

Larger sample

Research Method (Phase 2)

Experimental Lab Design

Public good game
Questionnaire including individual differences (moderators) such as citizenship

Sample

178 people (Phase 1: 144),
General population (Phase 1: students)
10 experimental sessions (-)

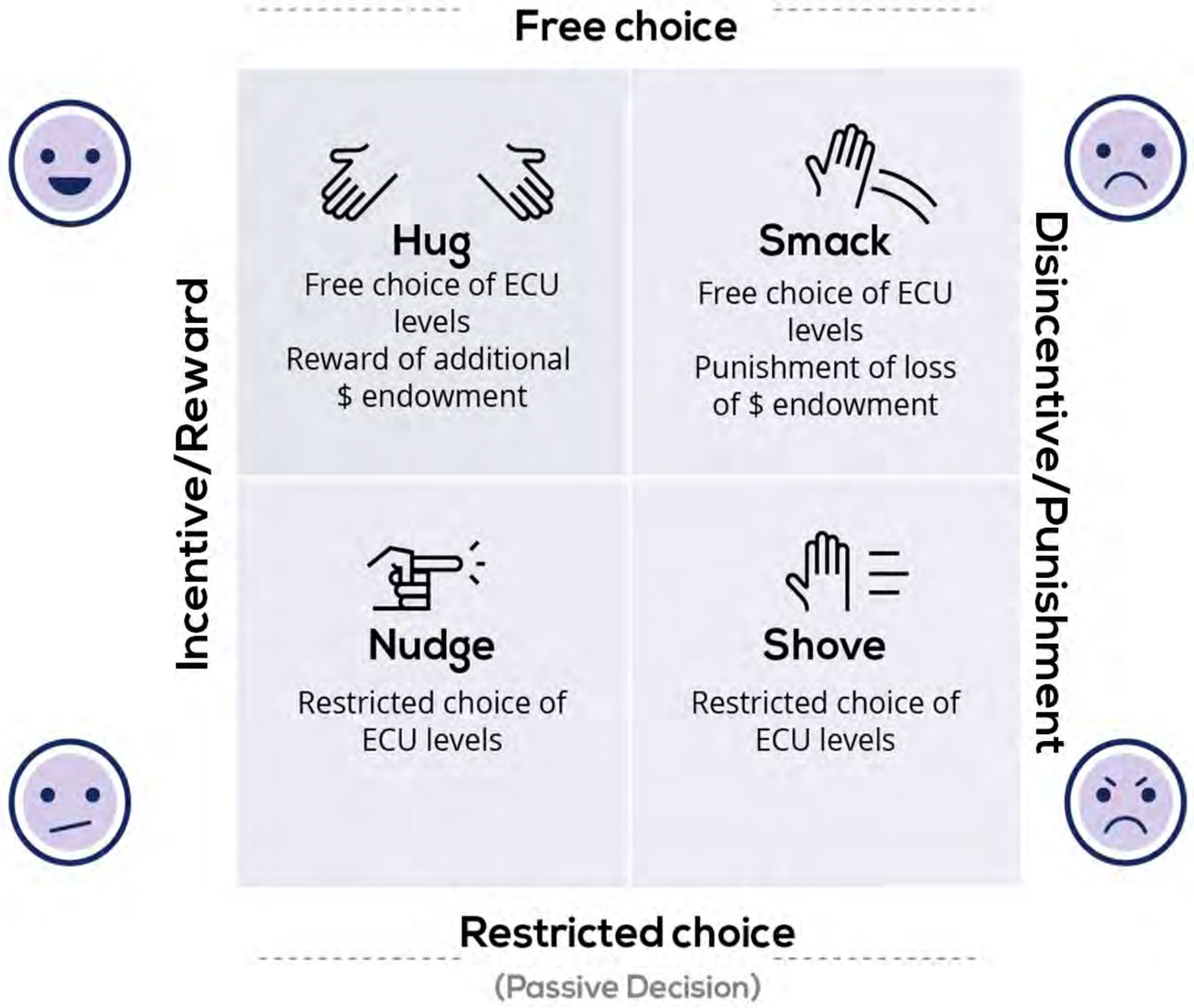
Data Cleaning and Analysis

T-Tests and regression analysis – Which lever is most influential? How does this decay over time?

Which individual differences influence the effectiveness of the levers for encouraging prosocial behaviour?

Our 2 x 2 experiment

Choice
(restricted/free)
and
Outcome
(reward/punishment)



How did we create hugs, nudges, shoves, and smacks?

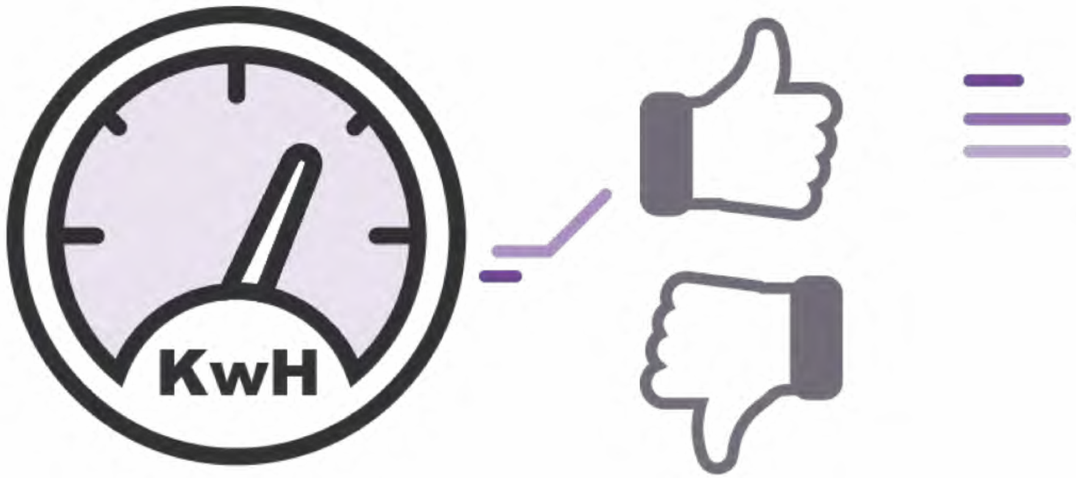
Different design to Phase 1 (lab experiment with students):
Scenario focus was originally general, in this experiment it was peak usage

In this experiment, the shove started at 3 instead of 5.

Tested over 8 rounds instead of 16, reflecting the lower frequency of event days

Baseline: **Payoff = (10 – x)+ [¼ *(x+y)]*1.6**	**Standard Treatment**	
Hug Payoff = (10 – x)+0.1x+ [¼*(x+y)]*1.6	Reward for contribution	
Nudge Payoff = (10 – x)+ [¼ *(x+y)]*1.6	Auto-selected contribution amount	
Shove Payoff = (10 – x)+ [¼ *(x+y)]*1.6	Choice restriction	
Smack Payoff = (10 – x) * 0.9 + [¼* (x+y)]*1.6	Punishment for non-contribution	

Dependent Variable (x)



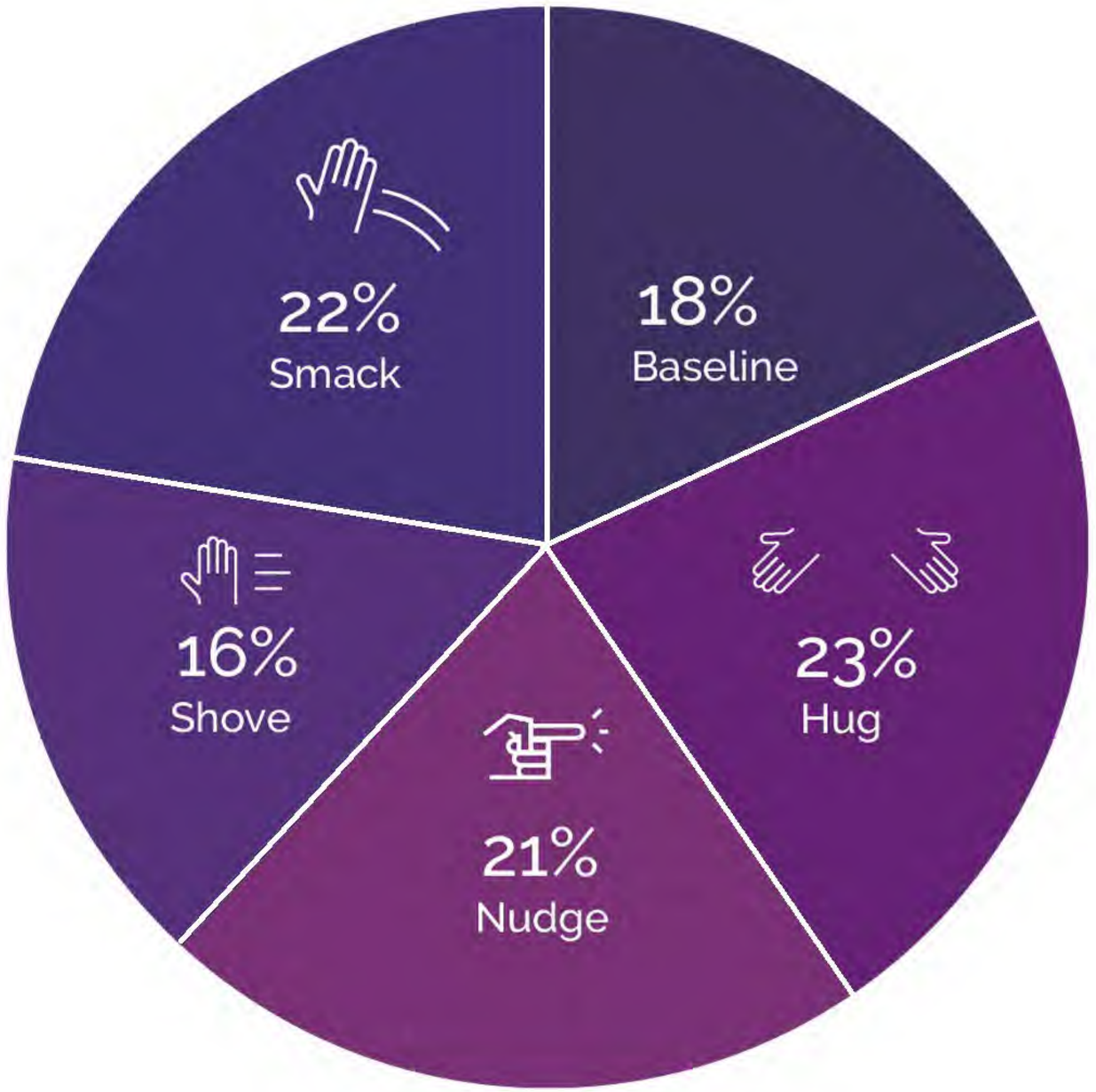
Consumer responses:
Willingness to conserve energy (kwh) during peak time

Data Collection and Sample

Data was collected across 10 experimental sessions, conducted at the QUT QuBE lab.

A total of 182 general population adults took part. The useable sample was 178

Participants were randomly allocated to one of five treatments



Sample Comparison

Phase 1 (n=144)

Students

Majority Sample Age: <36 years

Younger skew

Gender: 56.25% male

Majority Income: <$11'000 p.a.

Income Skew: Lower

Phase 2 (n=178)

General Population

Majority Sample Age: >36 years

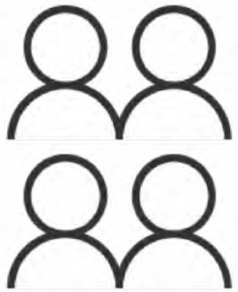
More balanced mix of ages

Gender: 44.94% male

Majority Income: >$70'000+ p.a.

Income Skew: Balanced

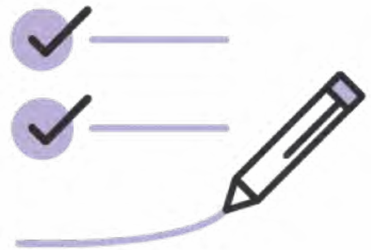
Experimental Process



Groups of 4 players (16 people at a time) simultaneously

Read instructions, Test questions

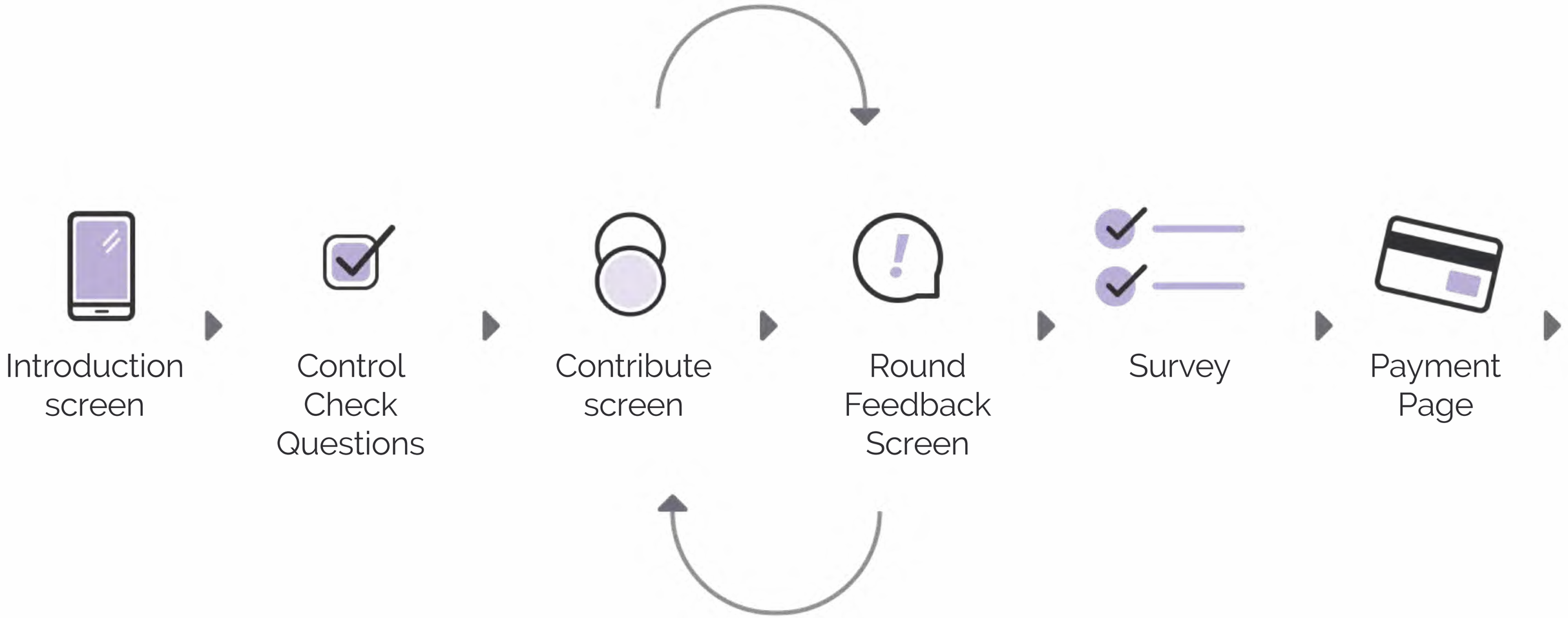
Play 8* rounds of the game



Then complete survey – demographics and moderating variables

* Original lab experiment with students played 16 rounds. Behaviour of peak usage required fewer rounds

How does the game run?



Understanding of Questions

For example:

Imagine in neighbourhood 1, these were the contributions:

5	**9**	**3**	**5**
(Your contribution)	(one of the other three people)	(Another person)	(another)

If we add these together, we get 20 tokens for the neighbourhood to share.

The investment means this total goes up by 160% (multiply by 1.6), meaning the neighbourhood actually now has 32 tokens.

When we divide 32 by 4 people, this means that each person gets 8 tokens back. This means you have 8 tokens (+ the 5 tokens you did not contribute) for a total of 13 tokens to use for the next round of the game.

Results

Thanks for playing in round 3!

You contributed:	9 tokens
Other players contributed:	5 tokens 3 tokens 5 tokens
Total contribution:	20 tokens

Your earnings in this round: **8 tokens**

(total neighbourhood tokens x 160% and divided by number of players)

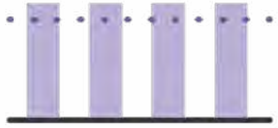
Your total tokens left: **9 tokens**

(your share of neighbourhood tokens + tokens you haven't spent yet)

Phase 2 Results

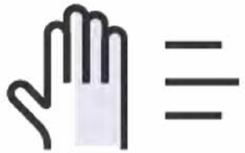
RQ1:
What worked best?

RQ1. How do consumers respond to each of the four policy levers for demand control?



No treatment made a significant difference to participant contributions

- If at all, negative interventions (penalties – smack , limitations of choices – shoves) lead to lower contribution levels.

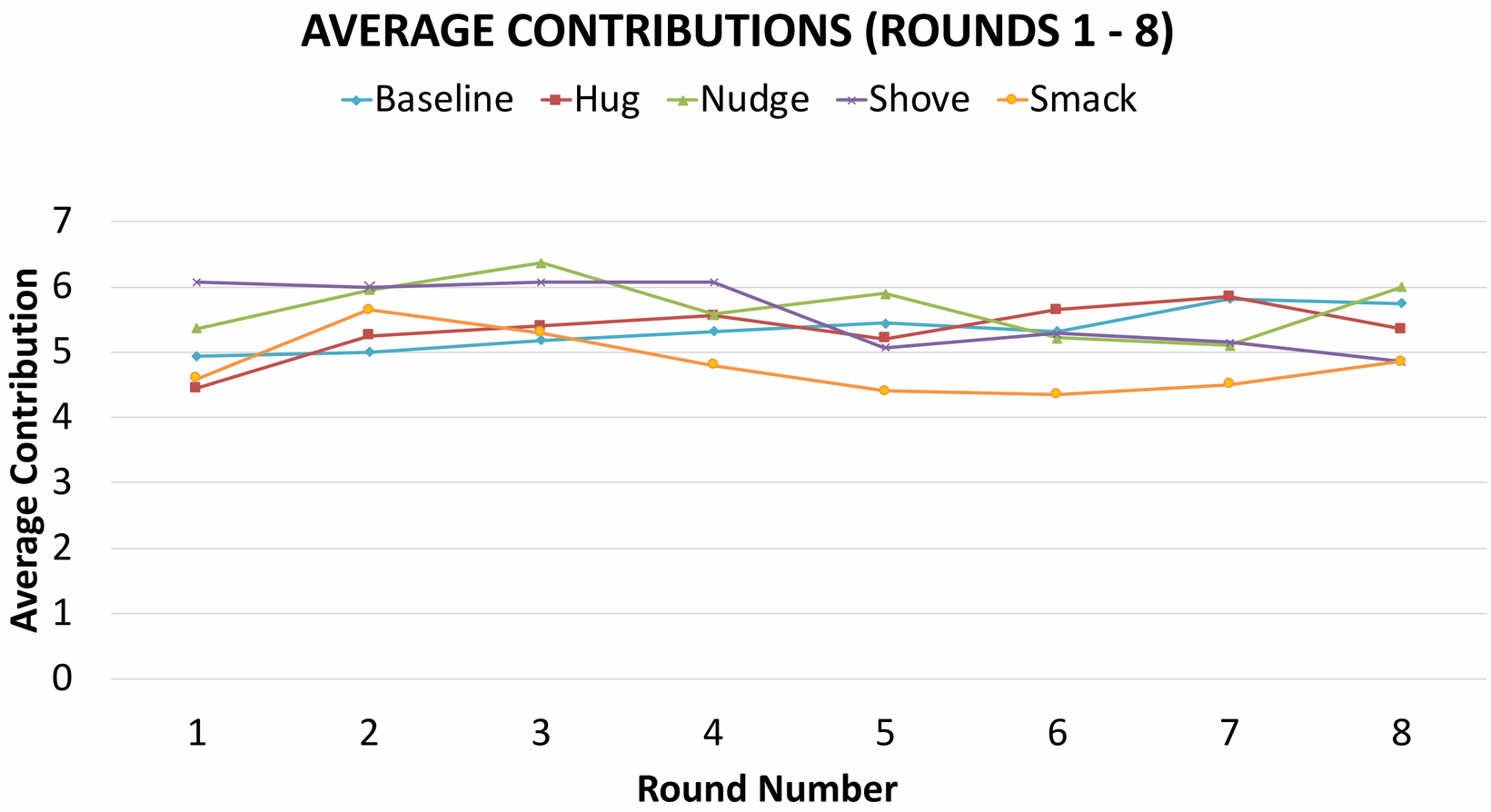


The shove initially results in higher contributions (round 1) but by the end, none of the treatments are significantly higher than the baseline. In fact, the baseline increases.

Phase 2 Results

RQ1: What works best?

Phase 2 Results (the current study)



Result: High Baseline Contributions

- In this scenario, baseline contributions are very high.
- Shove and Smack seem to lead to a backlash or to a social norm

Phase 2 Results

RQ1: What worked best?

A closer look at the Shove

Round 1	SD	Mean	T-stat	Significance	Hypothesis result
Shove vs Baseline	1.59 2.41	6.071 4.938	-2.1202	0.0191*	Supported
Shove vs Hug	1.59 2.02	6.071 4.45	3.5423	0.0002**	Supported
Shove vs Nudge	1.59 1.79	6.071 5.369	1.6526	0.0486*	Supported
Shove vs Smack	1.59 2.36	6.071 4.6	3.0732	0.0015**	Supported

While this effect eventually disappeared – the Shove may still represent the best option for discrete actions (e.g., event days), provided strong restrictions are offered.

Case Study Water Restrictions: The ‘Shove’ of the Millennium Drought

“South East Queenslanders have shown in the past that they can change their water use when asked”

SE Queenslanders used to use a lot of water, until a drought (and visible restrictions) changed their behaviour for the benefit of themselves and society.

By the numbers:

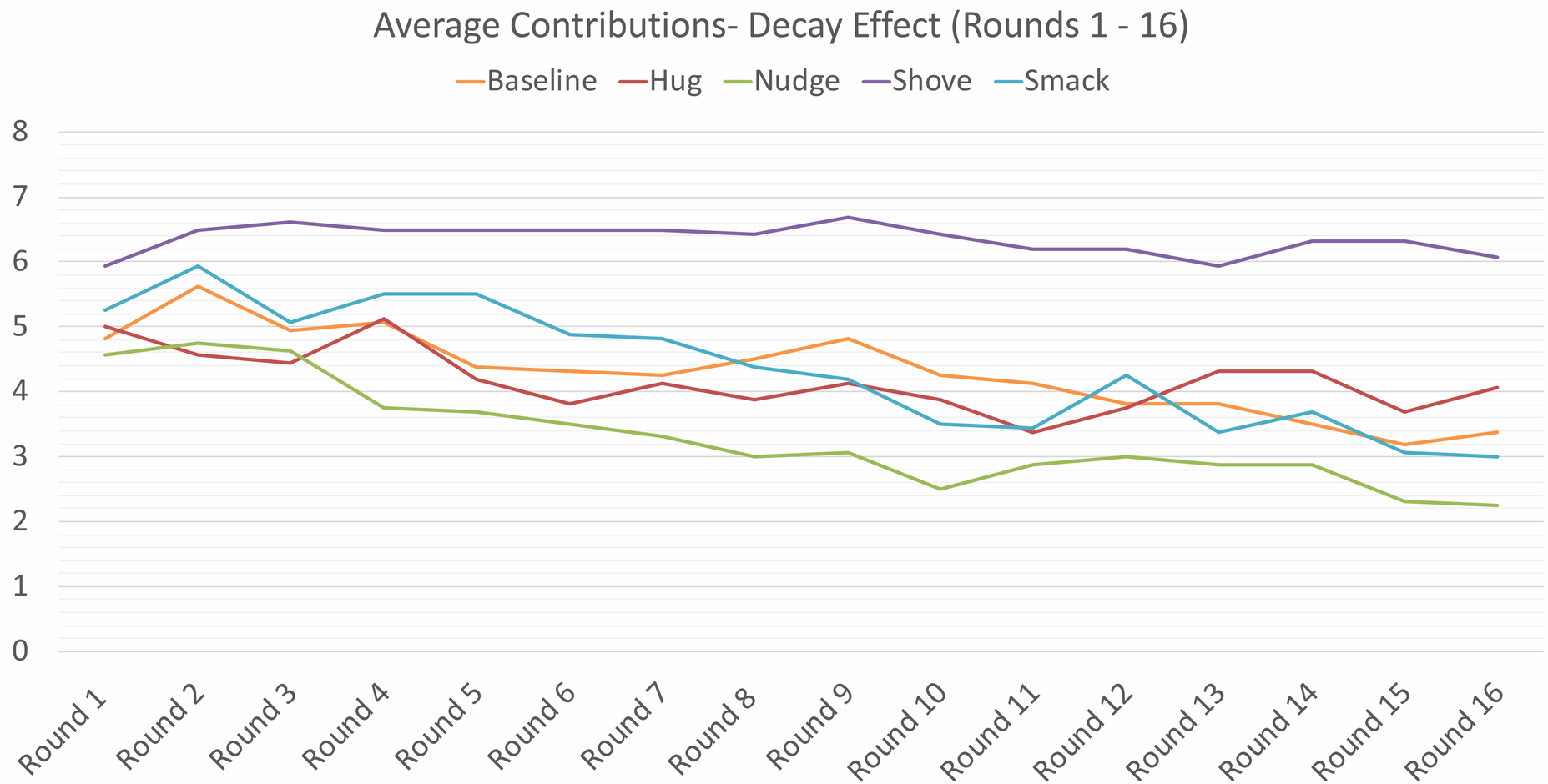
- Prior to drought (2002): 292 L/day average per person
- During drought (2007-8): 140 L/day average per person
- Currently 175 L/day average per person (sometimes >200L).

Clear, visible restrictions like the 4-min shower timer provided the ‘Shove’ needed. Post-restrictions, good habits still persist, but are diminishing.

Phase 1 Results

RQ2: Decay over time

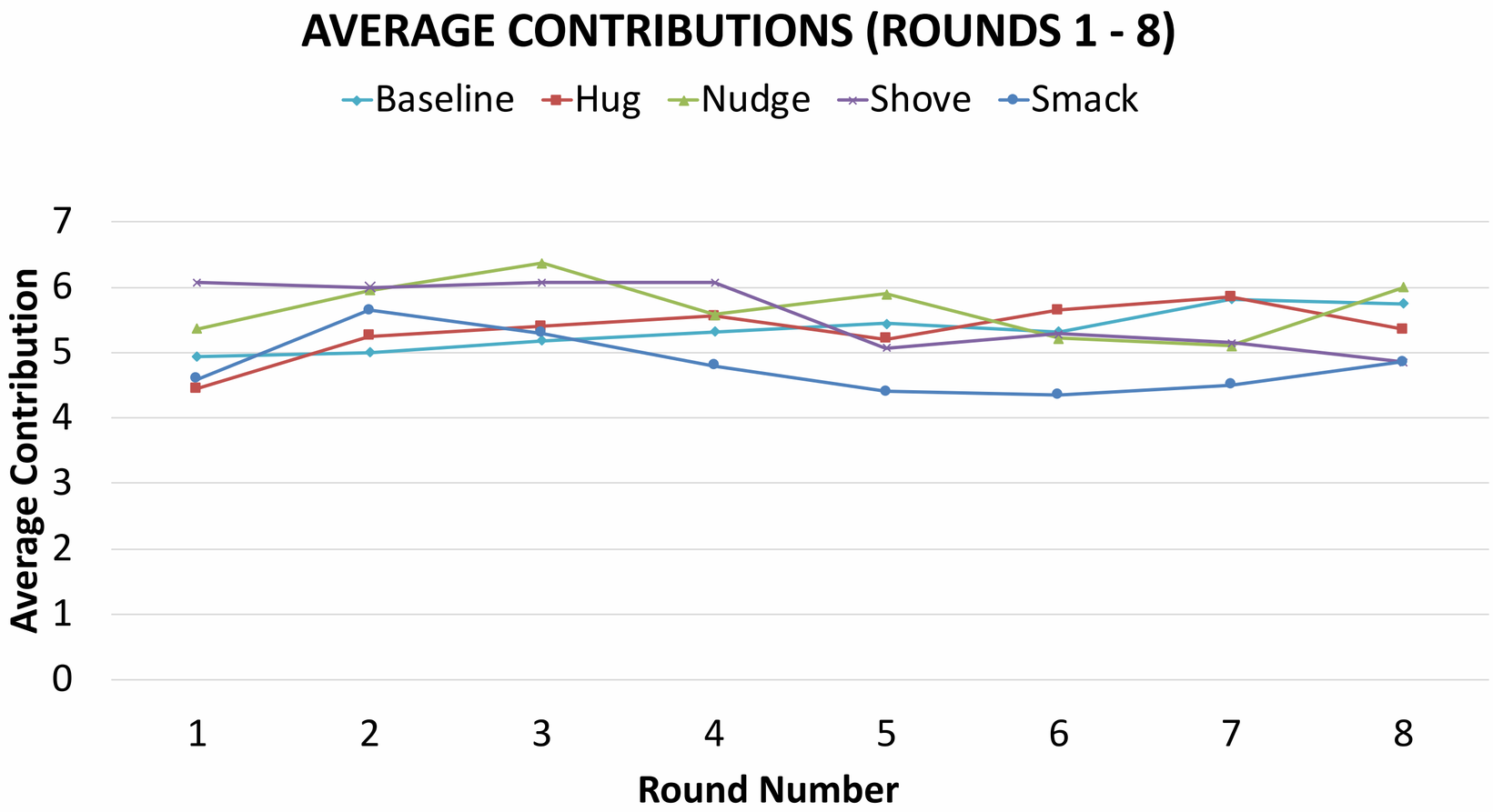
Phase 1 Results



Phase 2 Results

RQ2: Decay over time

Phase 2 Results (the current study)



Results
Did the effect decrease with time?

RQ2: How does the initial effect decay over time for each lever?

- There has been no indication that the level of cooperation is deteriorating over time given the described decision situation.
- This is in contrast to Phase 1 results. This may indicate more stability of response in the general population.

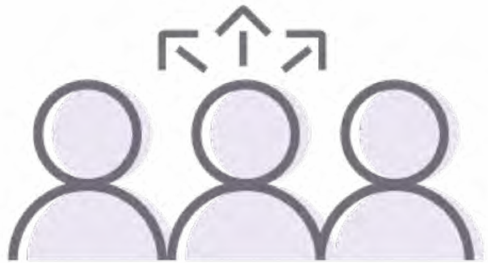
Results Individual differences

RQ3: What are the individual differences that influence consumer responses to the levers?

- In general, those who believe in being good citizens (”pitching in”) contribute more - this is the same across both phases.
- Phase 2 also found results from age, ethnicity, employment and taxation compliance attitude.

Phase 1 Results

Individual differences



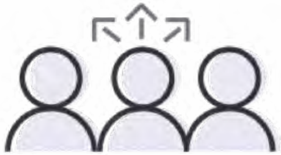
In Phase 1, highly pro-social customers were more generous.

That is, those with higher levels of other-oriented empathy made higher contributions.

In Phase 2, we decided to dig deeper on individual differences

Phase 2 Results

Individual differences



Participatory citizenship
participants with higher levels of participatory citizenship contribute larger amounts to the public good. $P < 0.01$.

Age
as participants age increases, so does the contribution amount. $P < 0.1$.

Taxes
the more a participant justifies cheating on their taxes, the less they will contribute. $P<0.05$

Ethnicity
participants who identify as Asian, contribute smaller amounts than Caucasian participants. $P < 0.05$.

Employment
participants who are “Unemployed/looking for work,” will contribute smaller amounts than participants who are employed. $P < 0.01$

A closer look at the variables (round 4-8)

Contribution	**Coefficient (t-value)**
Treatment Dummy – Baseline Reference	
Hug	-0.27 (-0.96)
Nudge	0.01 (0.04)
Shove	-0.52* (-1.66)
Smack	-1.37*** (-4.94)
Gender Dummy – Female Reference	
Male	-0.01 (-0.05)
Personally Responsible Citizenship	0.00 (0.01)
Participatory Citizenship	0.01*** (3.39)
Justice Oriented Citizenship	-0.00 (-0.48)
Self-Efficacy	0.00 (1.21)
Bill Amount	0.03 (0.50)
Age	0.02** (2.23)
Cheating on Taxes	-0.26*** (-2.68)

A closer look at the variables (round 4-8)

Renter Dummy – Owner Reference	
Renter	0.36* (1.66)
Education Level	0.12** (2.17)
Household Income	-0.18*** (-2.89)
Type of Household Dummy – At home with parents Reference	
Group or shared household	-0.70 (-1.21)
One parent family	-1.63** (-2.12)
One-person household	-1.38** (-2.18)
Other	-2.64*** (-3.21)
Part of a couple with children	-1.19** (-2.02)
Part of a couple without children	-1.54** (-2.49)

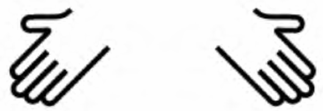
A closer look at the variables (round 4-8)

Ethnicity Dummy – White/Caucasian Reference	
Asian	-1.45*** (-3.14)
Hispanic	0.27 (0.32)
Other Ethnicity	-0.83* (-1.93)
Employment Dummy – Employed Reference	
Homemaker	-0.64 (-1.24)
Other Employment	0.83** (2.29)
Retired	-0.21 (-0.57)
Student	-0.94 (-1.23)
Unemployed/looking for work	-1.29*** (-2.94)
Bill Period Dummy – Bi-monthly Reference	
Monthly	-0.90 (-1.25)
Quarterly	-1.37** (-2.00)
Constant	6.22*** (5.05)
N	890
Prob. > F	0.000

Comparison of Results from Prior Study

The long-term effectiveness of the shove approach

No difference in long-term effectiveness of approaches

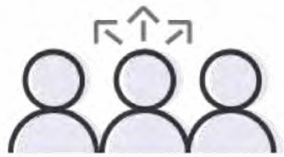


The short-term effectiveness of the hug approach

The short-term effectiveness of the shove approach

The ineffectiveness of the nudge and smack

The unintended negative effect of the smack and shove over time



The moderating effects of pro-social propensity in electricity consumption.

The moderating effects of participatory citizenship and other individual differences.

Males and females respond differently to intervention approaches.

No significant difference in how males and females respond in this general population sample

Source: Orr, Russell-Bennett & Dulleck, 2017 (left) and the current study (right)

Limitations

Real rate payer participant pool in the lab environment:
Potential for confusion of participants

Experimenter bias/Hawthorne effect:
The results may be biased due to participants wanting to show a specific behaviour given the experimental setup

No skin in the game:
The stakes on which these decisions are based are low compared to similar decisions in the real world.

External validity:
A computer based experiment can only provide first evidence into real world behaviour

Key Points

The high shove was the most effective approach (Phase 1)
Caveat – restriction level is important.

The smack and shove have unintended negative effects - Potential reactance.

Negative interventions (smack, shove) seem to crowd out good behaviours and lead to lower contributions.

The high baseline indicates the community may be already willing to work together on this…but do not ask often.

Communication issue apparent – value needs to be clear. We're all in this together, but DON'T ask me to solve network problems.

Communication of such situations is important and may in itself provide sufficient incentives for behavioural change.

Interactive Discussion

Moving Forward

What did you find most interesting or surprising?

What would you like to see highlighted in the report?

What are the policy implications of these findings?

Next Steps

Submission of Final Research Report (Nov 30)

Possible collaboration: Field experiment ECA + networks?

Thank you!