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Energy Consumers Australia

Hug, Nudge, Shove or Smack?

Testing approaches to enabling consumer energy use behaviour change:

Method

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Who we are

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Agenda
and Purpose of the Session

- 12.30-12.50pm: Introductions
- 12.50-1.00pm: Brief Background to the Project
- 1.00-2.30pm: Interactive Discussion
- *Welcome to those who also attended the earlier session!*

Introductions

Who is in the room?
What is your interest in today's session?

Background to the Project

Research Questions

What we know

- The four policy levers can be successful at affecting behaviour change

What we don't know

- How (different types of) consumers will respond to each of the four levers when it comes to ToU pricing

Research Questions

- **RQ1**: How do consumers respond to each of the four policy levers?

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

RQ3: How do individual differences influence consumer responses to the levers?

Research Method

Experimental Lab Design

- Abstract public good game
- Questionnaire including individual differences like prosocial propensity

Sample

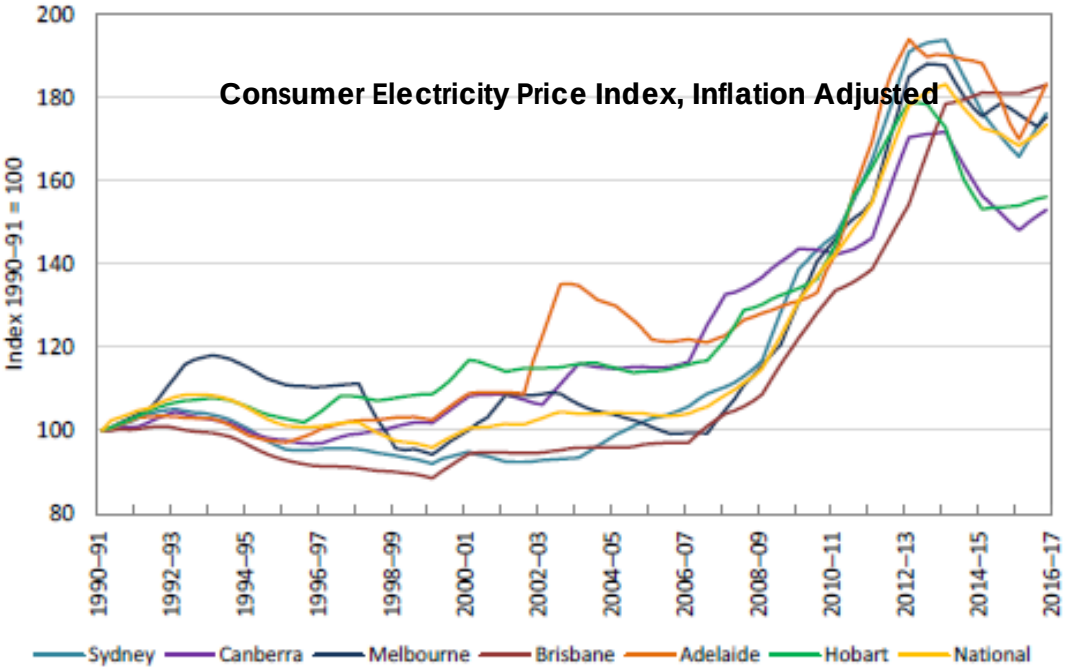
- 160 people, general population
- 10 groups of 16 people (4 groups per session)

Data Cleaning and Analysis

- T-Tests and ANOVAs – Which lever is most influential, How does this decay over time
- ANCOVA and Factorial ANOVA – Which individual differences influence the effectiveness of the levers for encouraging prosocial behaviour?

Electricity pricing and consumers

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



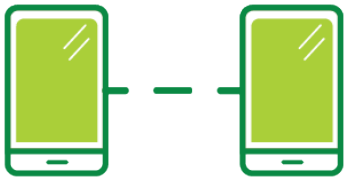
Source: Data from ABS, Graph from ACCC: *Retail Electricity Pricing Inquiry – Preliminary Report*, 22 September 2017

Behavioural Economics: Insights and Limitations

- **Defaults and Efficiency**
  Efficient (CFLB) bulbs are kept 80% of the time when they are installed as the default, whereas traditional ILB (incandescent) bulbs are kept 56% of the time (Dinner et al., 2011) – US study.

“Default is an implicit endorsement”

(Sunstein, 2016; Madrian & Shea, 2001; McKenzie et al, 2006).



Behavioural Economics: Insights and Limitations

- **Smart Meters**
  EU target of 80% of homes with smart meters (directive 2009/72/EC).

  - Oelander and Thorgerson (2013) show opt out frame leads to a **50% higher uptake** in smart meters than information alone.

  - Sunstein (2016), Johnson and Goldstein, see inertia or procrastination as a major reason.

Behavioural Economics: Insights and Limitations – Hugs & Smacks

- **Loss aversion**
  German data (Infas Energiemonitor, 2012) shows tariff switches are rare – even if the alternative is "green and cheaper".
  - How a price is presented matters – Thaler et al. (1994), McGraw et al. (2010).
  - Brown et al. (2013) – people go with the default unless it makes them too cold, pay too much.

The Ethics of Energy Nudges

- Sunstein (2016):
  - Welfare, net-benefits: Green Defaults vs. “benefits, as judged by themselves”
  - Dignity/Autonomy: Active Choice.
  - Self government – trusting institutions: Evaluated solutions as defaults.

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 (McDougall, 1908). **Prosocial Propensity,** refers to the individuals predisposition to engage with prosocial behaviour.

The Consumer must decide; Will I reduce my own consumption, incurring a personal cost, to contribute to a common resource (Dawes, 1980).

What is a public good game?

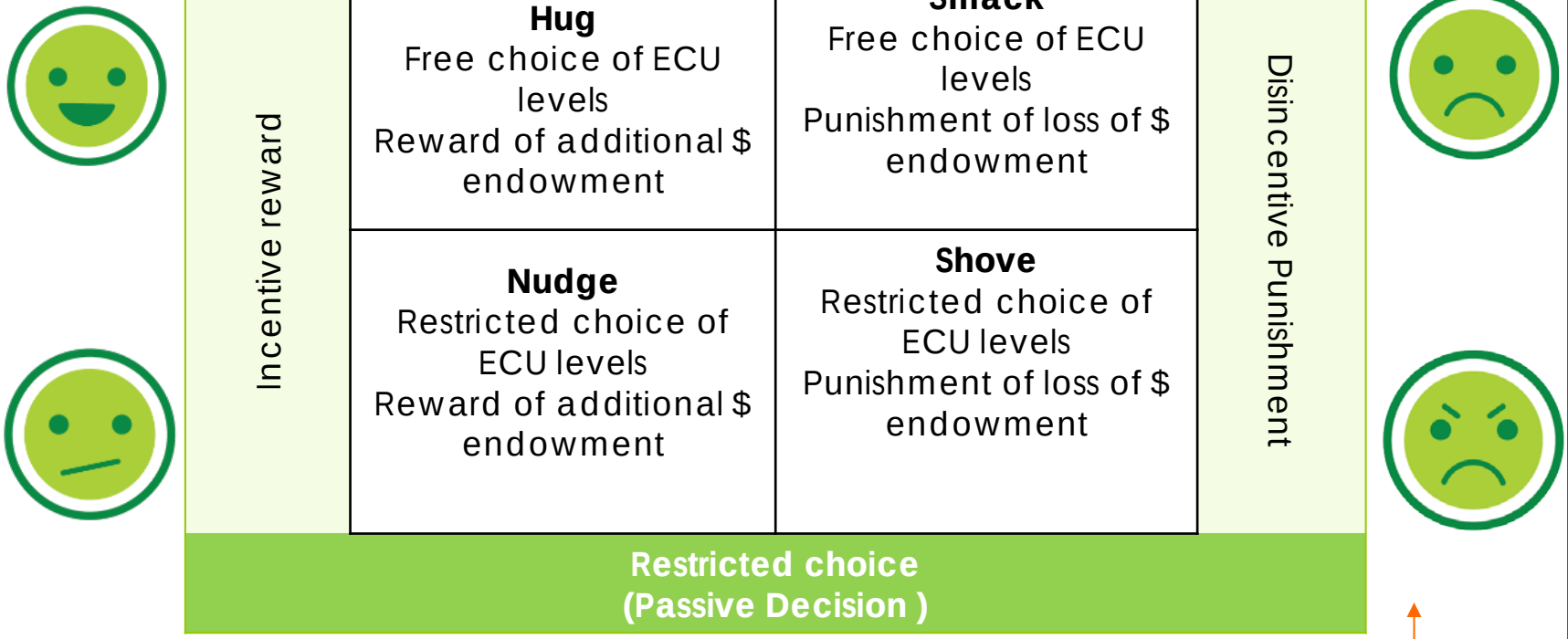
Terminology

- ***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.

Possible 2 x 2

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



Question: How do you think these findings might help to operationalise the *nudge, hug, smack and shove* in the energy sector?

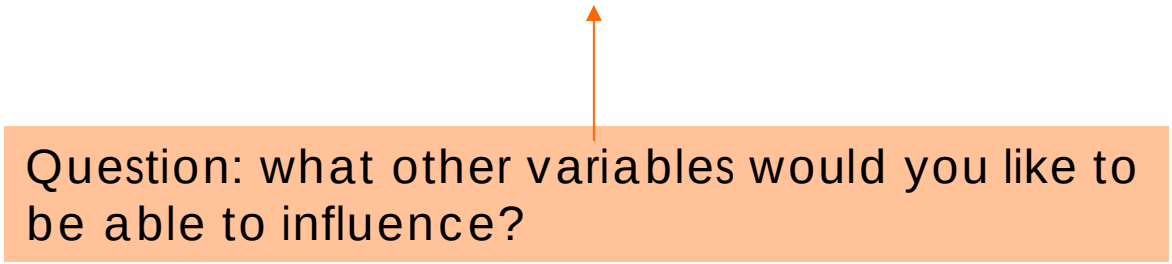
How do we create hugs, nudges, shoves, and smacks?

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

Question: What are the existing levers that you are aware of that encourage consumers to change their energy behaviours? How are consumers responding?

Dependent Variables

- Consumer responses:
  - Willingness to conserve energy (kwh)



Data Collection

Two stages are proposed, allowing us to test the robustness of the research in two environments, building the evidence base for knowledge and method at once (providing useful insights into consumer behaviour *and* the best platform to use).

- **Stage 1**: QuBE Lab at QUT (in person)
- **Stage 2**: Online survey using partner Rubin8
  - http://www.rubin8.com.au/

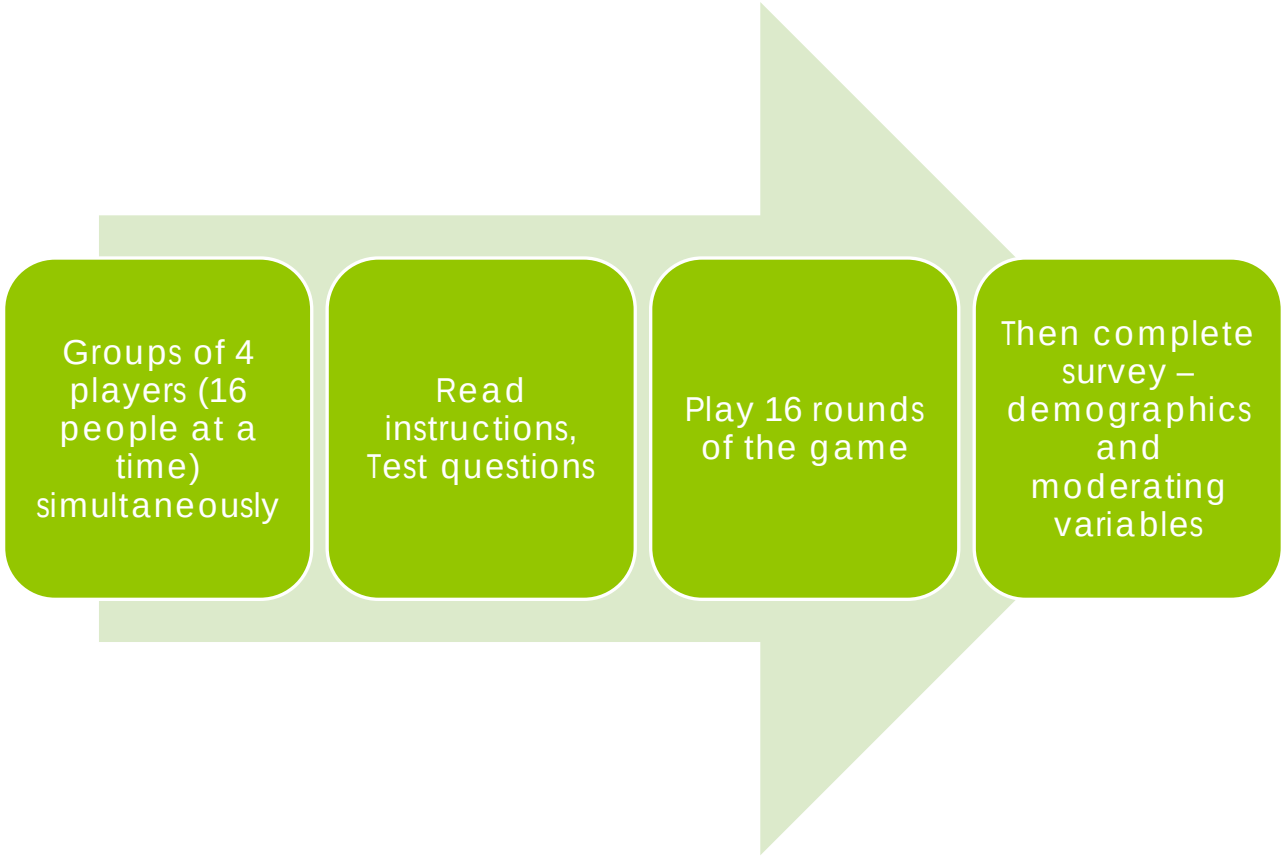
Question: what do you think of the online vs the offline approach? What percentage of sample should be in each?

Sampling and Recruitment

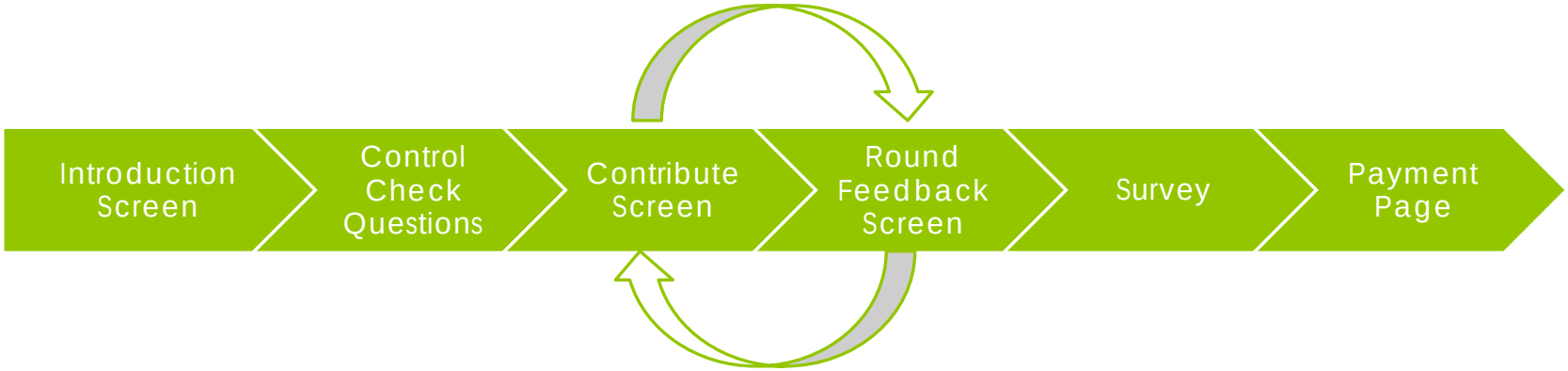
- We can collect online or offline
- Seeking general population adults (different from the student samples usually used)

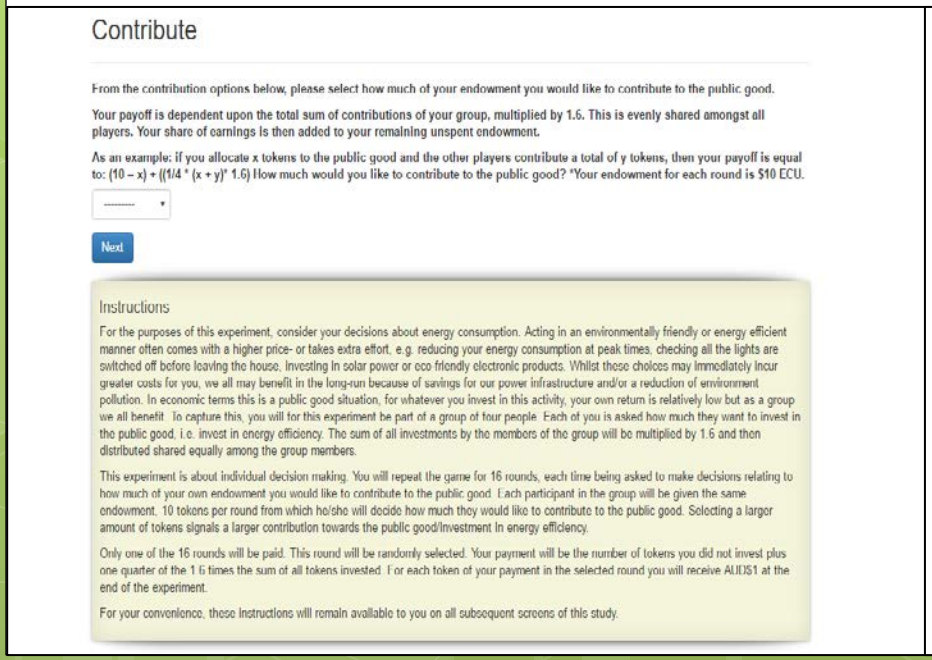
Question: what sampling criteria are *critically* important?

Experimental Process



How does the game run?





Contribute

From the contribution options below, please select how much of your endowment you would like to contribute to the public good.

Your payoff is dependent upon the total sum of contributions of your group, multiplied by 1.6. This is evenly shared amongst all players. Your share of earnings is then added to your remaining unspent endowment.

As an example: If you allocate x tokens to the public good and the other players contribute a total of y tokens, then your payoff is equal to: (10 – x) + ((1/4 * (x + y)* 1.6) How much would you like to contribute to the public good? *Your endowment for each round is $10 ECU.

Next

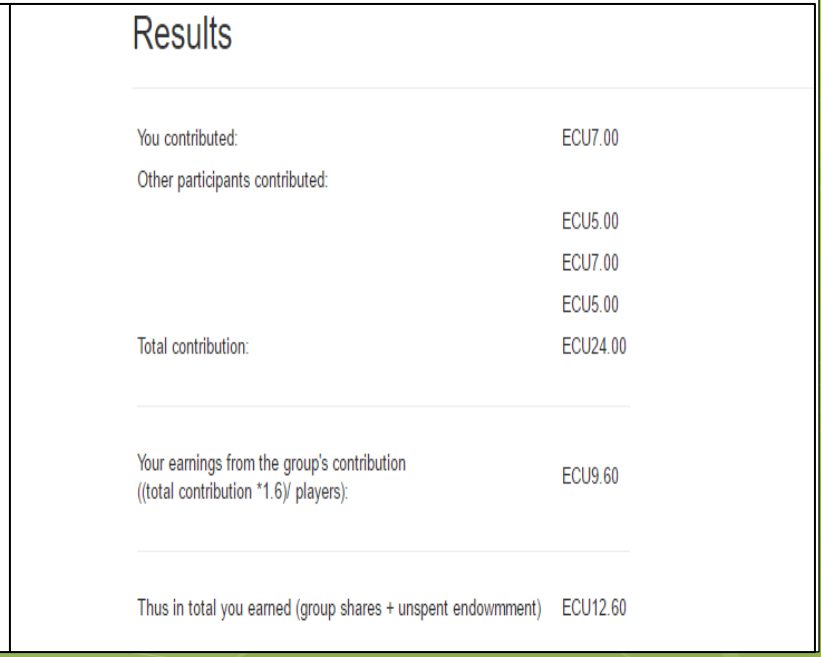
Instructions

For the purposes of this experiment, consider your decisions about energy consumption. Acting in an environmentally friendly or energy efficient manner often comes with a higher price- or takes extra effort, e.g. reducing your energy consumption at peak times, checking all the lights are switched off before leaving the house. Investing in solar power or eco-friendly electronic products. Whilst these choices may immediately incur greater costs for you, we all may benefit in the long-run because of savings for our power infrastructure and/or a reduction of environment pollution. In economic terms this is a public good situation, for whatever you invest in this activity, your own return is relatively low but as a group we all benefit. To capture this, you will for this experiment be part of a group of four people. Each of you is asked how much they want to invest in the public good, i.e. invest in energy efficiency. The sum of all investments by the members of the group will be multiplied by 1.6 and then distributed shared equally among the group members.

This experiment is about individual decision making. You will repeat the game for 16 rounds, each time being asked to make decisions relating to how much of your own endowment you would like to contribute to the public good. Each participant in the group will be given the same endowment, 10 tokens per round from which he/she will decide how much they would like to contribute to the public good. Selecting a larger amount of tokens signals a larger contribution towards the public good/investment in energy efficiency.

Only one of the 16 rounds will be paid. This round will be randomly selected. Your payment will be the number of tokens you did not invest plus one quarter of the 1.6 times the sum of all tokens invested. For each token of your payment in the selected round you will receive AUD$1 at the end of the experiment.

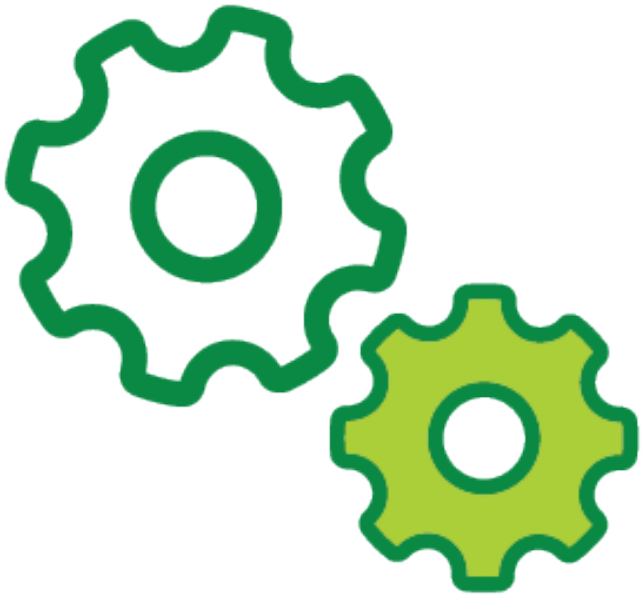
For your convenience, these instructions will remain available to you on all subsequent screens of this study.



Results

You contributed:	ECU7.00
Other participants contributed:	
	ECU5.00
	ECU7.00
	ECU5.00
Total contribution:	ECU24.00
Your earnings from the group's contribution ((total contribution *1.6)/ players):	ECU9.60
Thus in total you earned (group shares + unspent endowmment)	ECU12.60

An example



Question: Are the instructions clear and intuitive for the experiment?

Instructions

Living in Australia, we all know what it's like to experience a blackout. But what if all of us 'chipped in' to avoid blackouts in the first place by taking steps to use less electricity  at busy times (like when it gets really hot in Summer or cold in Winter, or when most of the country is cooking dinner and watching TV at the same time)? You're about to embark on a game that asks this question. You will be playing with a virtual neighbourhood of four: **you**  and three other people  .

Each person will be given tokens that represent your electricity consumption  (the benefit you get from using electricity). At each stage you will be asked how many tokens you would like to contribute  to the neighbourhood. **The number of tokens you give to the neighbourhood**   **represent the amount of electricity you would willingly <u>not</u> use:** so, giving one of these  means one day of saving electricity (e.g., setting your air-conditioning to 24 degrees uses less electricity, etc)  .

Once everyone has decided how many tokens to give, these electricity savings will lead to savings for your neighbourhood overall (to represent this in the game, the total neighbourhood tokens given by everyone will be increased by 160%) and you'll get an equal share of this back at the end of each round. We will play **16 rounds** in total.

Here is the catch: **you have complete control** over how many tokens you give, and so do your neighbours. You could choose to give nothing, and so can everybody else. Because the tokens you get back at the end depend on the contributions of the whole neighbourhood, it is possible to get back **more** **or less** than you gave originally.

YOUR TOKENS:


= Number of days you would take action (e.g., keep air conditioning at 24 degrees, dry clothes outside, avoid using non-essential electricity)

YOUR NEIGHBOURS:

YOUR PAYOFF:

Are you ready? Let's play!

Question: The figure of 160% comes from the literature…is this realistic?

Understanding of Questions

Imagine in neighbourhood 1, these were the contributions:

- 9
- 5
- 3
- 5

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

The investment means this total goes up by 160%, meaning the neighbourhood actually has 32 tokens.

When we divide 32 by 4 people, this means that **each person gets 8 tokens back.**

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)

Overview of Results from Prior Study

The long-term effectiveness of the shove approach

The short-term effectiveness of the hug approach

The ineffectiveness of the nudge and smack

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

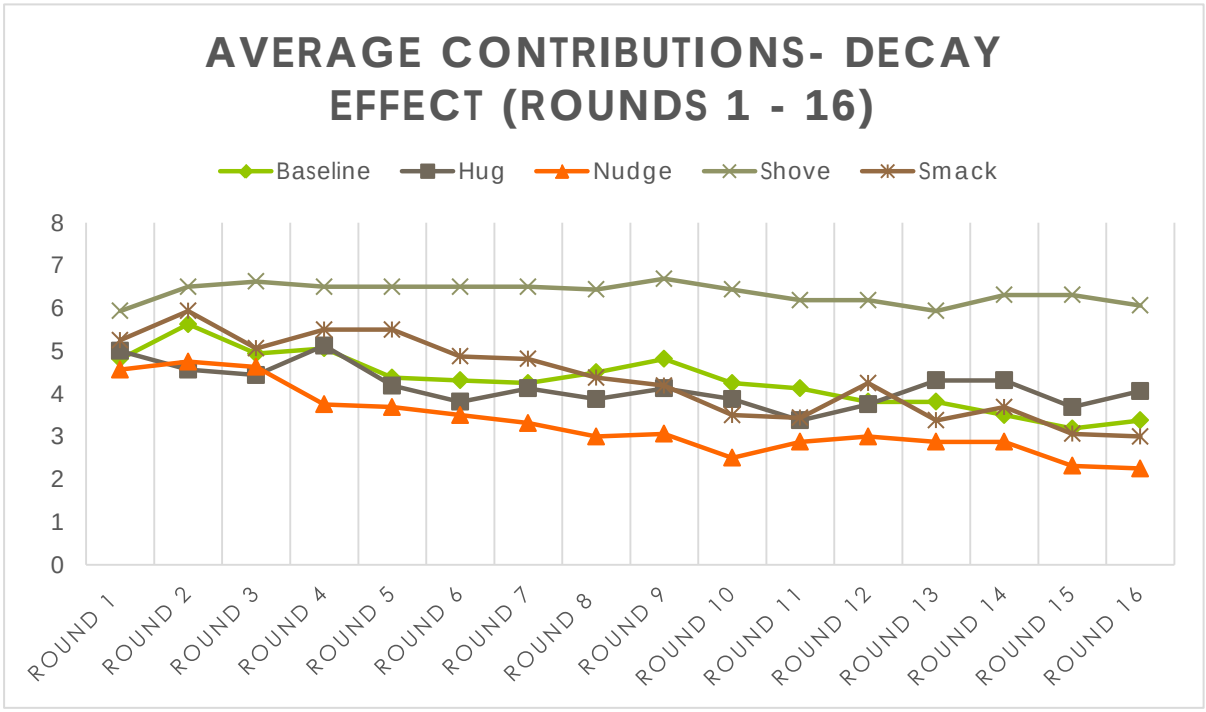
Males and females respond differently to intervention approaches.

Practical Implications for Policy Development in the Pro-Environmental Space

- Nanny State vs Free Choice
- Delaying the Saturation Point
- Segmentation

Source: Orr, Russell-Bennett & Dulleck, 2017

The Shove is the most effective approach to behaviour change for electricity consumption.



Key Points

The data says:

- In round 1, the shove treatment makes the highest contributions of all four treatments.
- In round 1, the hug treatment makes higher contributions than the baseline treatment.
- In round 16, shove contributions were not statistically different compared to round 1.
- In round 16, contributions were statistically smaller in the hug treatment compared to round 1.

What this means…

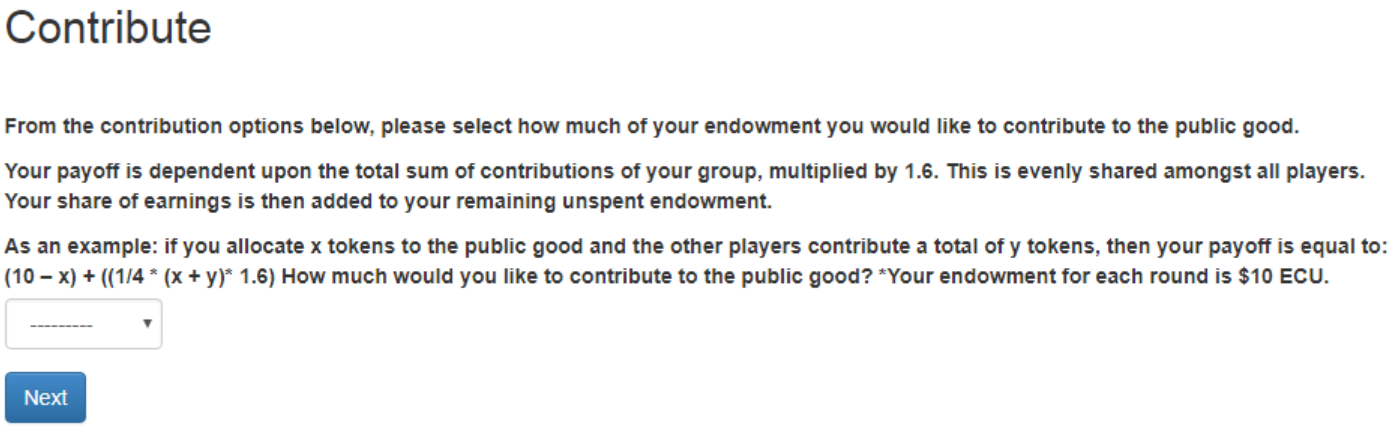
- The shove is the most effective approach to achieving sustained reduced electricity consumption.
- The hug provides only temporary behaviour change in reducing electricity consumption.
- The nudge and smack are not effective approaches to achieving reduced electricity consumption.

How do we implement hug, nudge, smack, shove ?

Question: How closely do you think the experiments match what has been done? What is new or different?

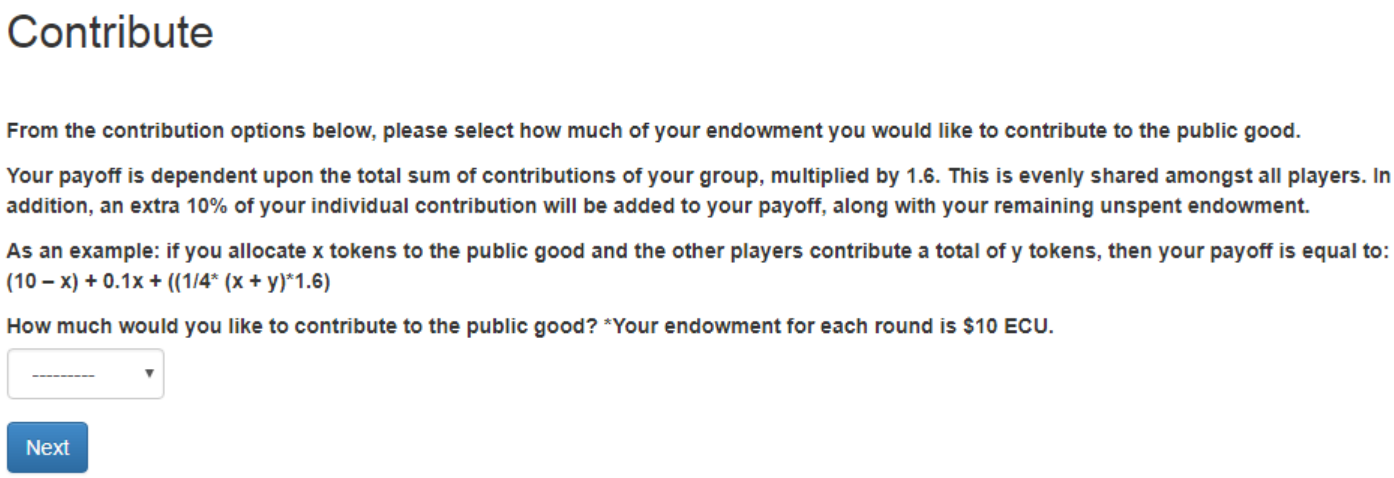
Baseline

- Options: 1, 3, 5, 7, 9
- Default: Not applied
- Financial Incentive: None



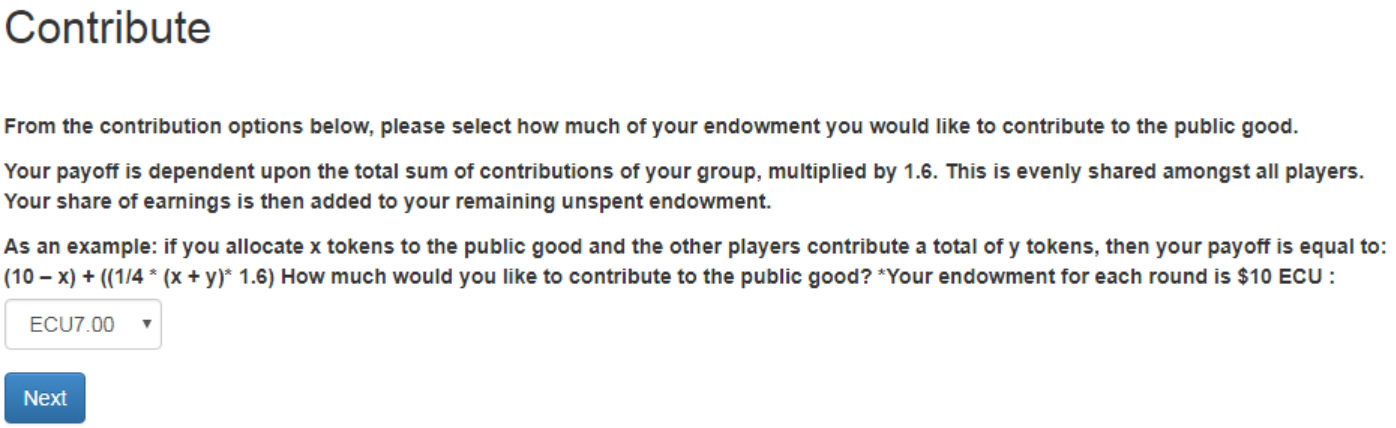
Hug – a reward

- Options: 1, 3, 5, 7, 9
- Default: Not applied
- Financial incentive: Positive



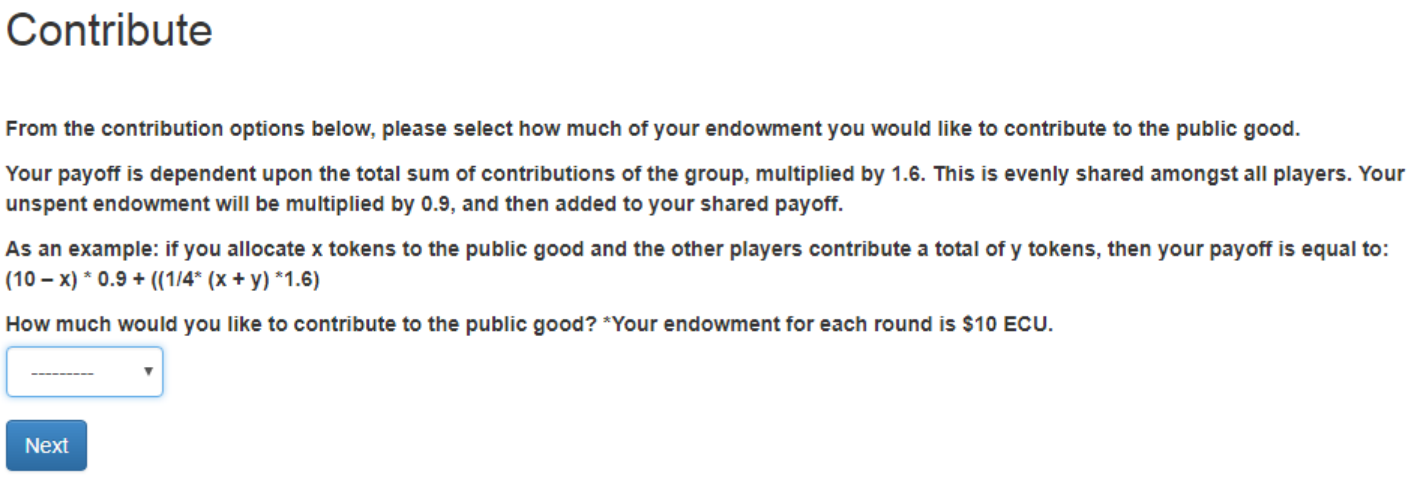
Nudge
– gentle push in the right direction

- Options: 1, 3, 5, 7, 9
- Default: Automatically lands on 7
- Financial incentive: None



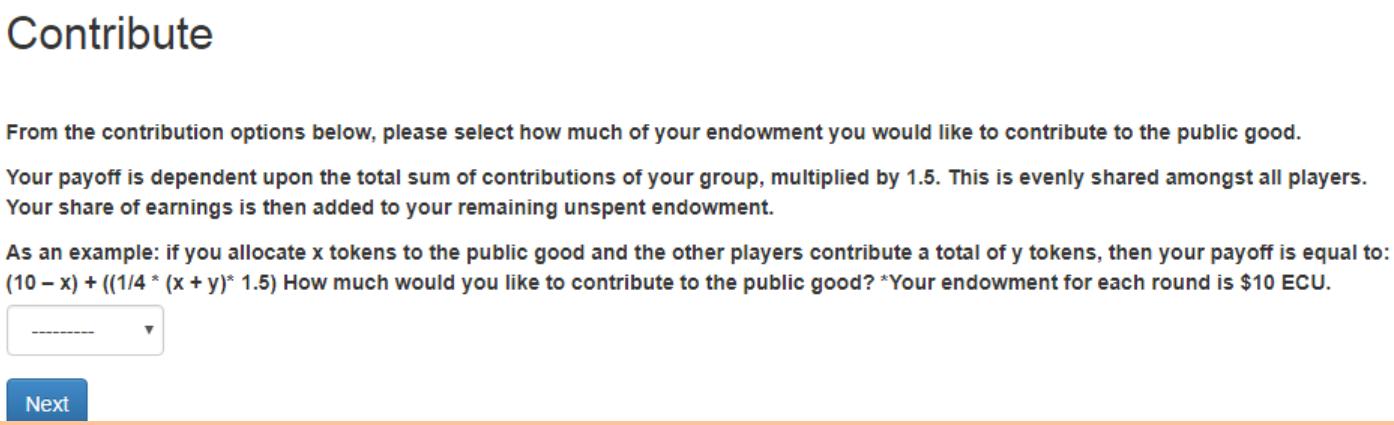
Smack – a punishment

- Options: 1, 3, 5, 7, 9
- Default: Not applied
- Financial incentive: Negative



Shove – a restriction of choice

- Options: 5, 7, 9
- Default: Removes lower options entirely
- Financial incentive: None



Question: The student results indicated the shove worked best BUT was the bottom level restriction too high – was it realistic (external validity)?

Individual differences -options

- What do we think might influence the effect of the levers on consumer responses?
  - Social/environmental consciousness
  - Demographics – gender, age, income
  - Political persuasion (citizen type)
  - Structural energy efficiency tools e.g. solar PV, batteries
  - Learned/Perceived helplessness
  - Self efficacy
  - Perceived behavioural control

Question: what other individual differences do you think are interesting in this context?

Additional Dependent Variables

- Power and control
- Political leanings
- Others?

Revisiting our Discussions

- How closely do you think the experiments match what has been done? What is new or different?
- What are the existing levers that you are aware of that encourage consumers to change their energy behaviours? How are consumers responding?
- Dependent variables: what other variables would you like to be able to influence?
- What do you think of the online vs the offline approach? What percentage of sample should be in each?
- What sampling criteria are *critically* important?
- Are the instructions clear and intuitive for the experiment?
- The experiments: The figure of 160% comes from the literature…is this realistic?
- How do you think these findings might help to operationalise the *nudge, hug, smack and shove* in the energy sector?
- The student results indicated the shove worked best BUT was the bottom level restriction too high – was it realistic (external validity)?
- What other individual differences do you think are interesting in this context?

Next Steps

- Discussion today
- Submission of draft research plan
- Ethical clearance, preparation, recruitment
- **Final research plan (Stage 3)**
- Then on to Stage 4: Conducting the experiments

Thank you!