

# Energy-Related Behaviour: *Generating Creative Designs*

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# *Initial Understanding*

- ◎ Herbert Simon's (1969) understanding of design and its capacity to create change in “*devising courses of action to change existing situations into preferred ones*”
  
- ◎ Market designs aim to produce to match “*Preferences*” but they overlook how people interacting with those designs affect behavior.

# Important Concepts

- ◎ ‘Artifacts have a co-responsibility for the way action develops and for what results. If we waste energy or produce waste in routine actions such as in the household practices, that has to do with the way artifacts guide us’ (*Jelsma, 2006*).
- ◎ Design for Behavioural Change (*Hekkert et al, 2014*)  
*understand people; why they behave the way they do, and to use design to encourage them to ‘do’, or ‘not do’ something.*
- ◎ *Models: Design with Intent (Lockton et al, 2010), Persuasive Technology (Fogg, 2003), Behavioural change wheel (Michie et al, 2011)*

# *Improving the application of DfBC*

- ◎ Understanding the effect of *Contextual factors* in residential and organizational environments (*non-bill based environments*)
- ◎ Targeting non-academic partners to clarify how those models work (*implementation and expectations based on their typical environments*)
- ◎ Understanding what and how the individual *perceives as positive or negative* possible behavior within their working or living environments.

# Our study: *Creativity of Smart Energy Control Devices*

- ⦿ Trying to find a more systematic method of involving the user into the designing process of energy control and management devices.
- ⦿ Trying to encourage participants to generate creative designs by manipulating how they construe objects or events
- ⦿ Based on the generated designs, we can build a comparison between market designs and participants' perceptions of how designs should be creative

# ***Theory again: Construal Level Theory***

- ◎ Human minds can construct counterfactual possibilities of reality, plan the future, absorb the influence of others and perceive spatially remote places (*Cooke, 2007*) (*Trope & Liberman, 2010*).
  
- ◎ Level of construal is the meaning of events, scenarios, or objects depending on how representations are formed mentally in either concrete or abstract construct (*Semin & Fiedler, 1988*) (*Trope, 1989*) (*Liberman & Förster, 2009*).
  - High Level of Construal: Big picture, abstract thinking, goal focused
  - Low Level of Construal: Concrete thinking, Interested in details, mean oriented

# *Construal level theory and Creativity*

- ⦿ Increasing psychological distance (high level of construal) has a significantly positive effect on creativity (*Förster, Friedman, & Liberman, 2004*).
- ⦿ **Creativity** ?? (*Generating novel or original (unexpected) ideas or products that are practical or useful*) (*Mumford, 2003*), (*Kaufman and Sternberg , 2010; Boden, 2004; Simonton, 2012*)
- ⦿ Will that also be true if applied in unfamiliar grounds such as energy-related creativity?

# Objectives:

- ⦿ Evaluating the effectiveness of different manipulations of construal level?
- ⦿ What kind of effect these manipulations will have a significant effect on both divergent (generating many ideas) and convergent thinking (generating the most likely right solution)?
- ⦿ If effective, using the most significant manipulation in round two: allowing people to design their own smart energy control and saving device (Scenario based experiment).



# ***The experiment (Between Subject Design)***

## ***193 Participants in total around 25-28 per condition***

- Spatial Distance: (Imagine spending the weekend in a cottage that is either 10 or 100 miles away from where you live).
- Temporal Distance: (Imagine your day tomorrow or a year from now)
- Why and How: (Why or how people try to save energy)
- Categories VS Examples: (Generate either an example of the given word, or a category that might include that object) (List of 25 objects)

Manipulation check: Behavioral Identification Task: (Ref) a list of 25 actions each has two descriptions (High or low level) or related to either abstract or concrete thinking  
(*Vallacher & Wegner, 1987*).

# ***Creativity Measures*** (Lubart (1994), Kaufman & Sternberg, (2010); Hommel (2012); Batey (2012):

- ◎ Divergent thinking:

Guilford Alternative Test (List as many uses as you can for a tin).

- Creativity was evaluated based on 4 dimensions: originality, fluency, flexibility, and elaboration (*Hommel et al, 2011*).

- ◎ Convergent thinking:

Remote association test (*Insight Problems*)

- Linking three seemingly unrelated words

Dust Falling Super (Linking word: (**Star**))

# Results:

- ⦿ There was a slight shift in means of creativity in the high level as compared to the low level manipulations but it was not significant.
- ⦿ We carried out several t-tests to compare the difference in means between groups in each condition. Spatial distance seems to positively affect creativity (p-value (0.0323)).

**Thank you**

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