

THE STUDY OF ENERGY CONSERVATION: INTEGRATING ENGINEERING AND THE SOCIAL SCIENCES

RESEARCH DAY 2010



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CANADIAN ENVIRONMENTAL INITIATIVE TEAM

THE TEAM

An interdisciplinary team comprised of members from the

- Center for Environment
Angela Loder, Luke Gelinas, Prof. Ingrid Stefanovic, Dr. Ellie Farahani
- Cognitive Engineering Lab
Kevin Trinh, Adam Smith and Prof. Greg Jamieson
- Sustainability Office - Dr. Beth Savan

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THE CHALLENGE

- Tendency to discount larger, more abstract, and distant concepts like the environment in favour of more immediate concerns like comfort and convenience
- At the point of decision more immediate concerns determine one's behaviour



THE GOAL

To design and test visual feedback displays that attempt to overcome obstacles to pro-environment behaviour and trigger conservation action

How?

- Use principles of feedback design
- Take advantage of theories in behavioural economics
- Use nature as part of feedback study
- Fiddle with ‘choice scenarios’ in such a way as to ‘nudge’ people toward better environmental decisions and look into ethical concerns in this regard

RESEARCH BENEFITS

Improved understanding of the psychological mechanisms of feedback; design & ethical guidance for feedback interfaces to promote sustainable behaviour

WHAT DO I MEAN BY “FEEDBACK”?

An example of a feedback display that is designed to evoke a sort of cognitive dissonance



BEHAVIOUR VS. ATTITUDE

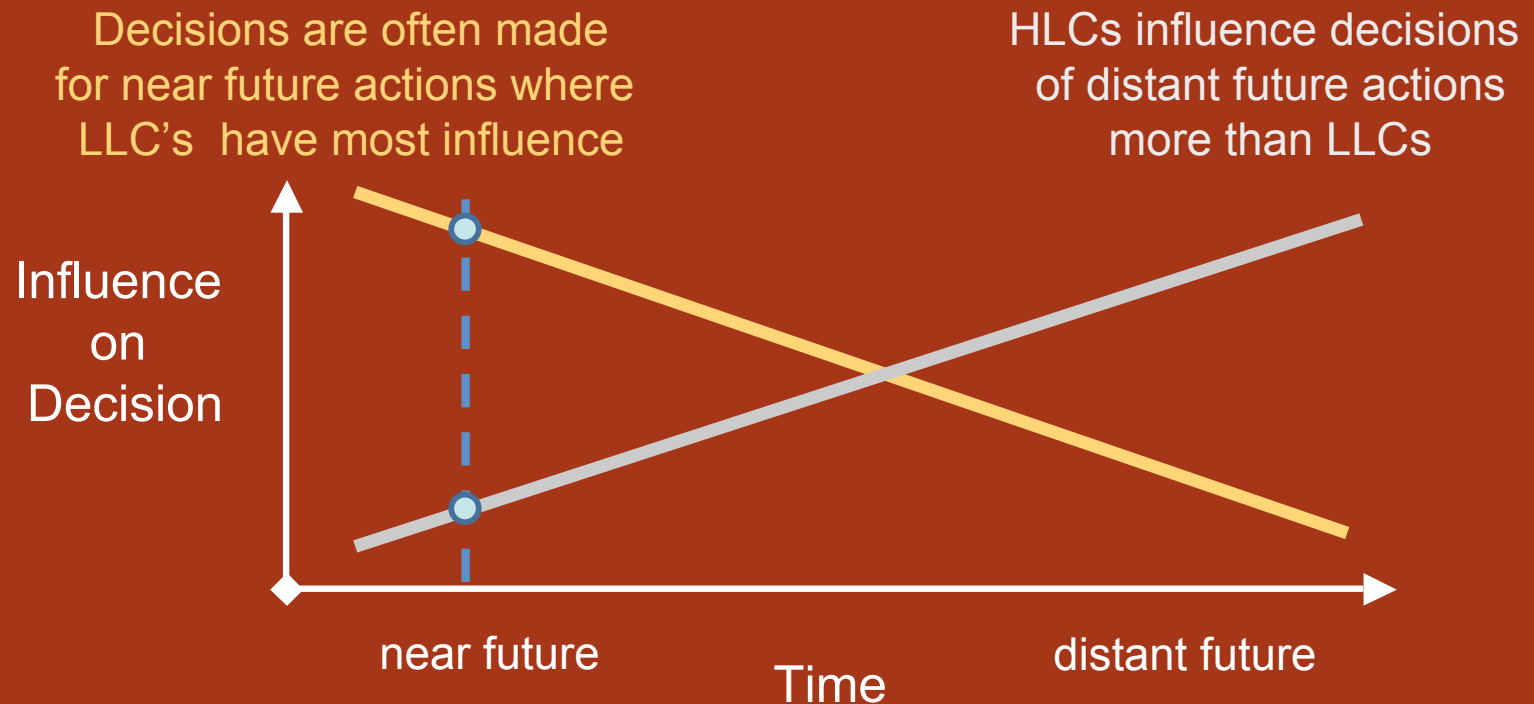
- Studies show lack of correlations between pro-environment behaviours and attitudes
- **ANTECEDENT STRATEGY** influence one or more determinants of behaviour prior to behaviour
 - Pledges/commitment; Goal-setting; Information
- **CONSEQUENCE STRATEGY** attach positive/negative consequences to pro/con-environment behaviour in order to influence behaviour
 - Feedback; Monetary rewards

TEMPORAL CONSTRUAL THEORY (TCT)

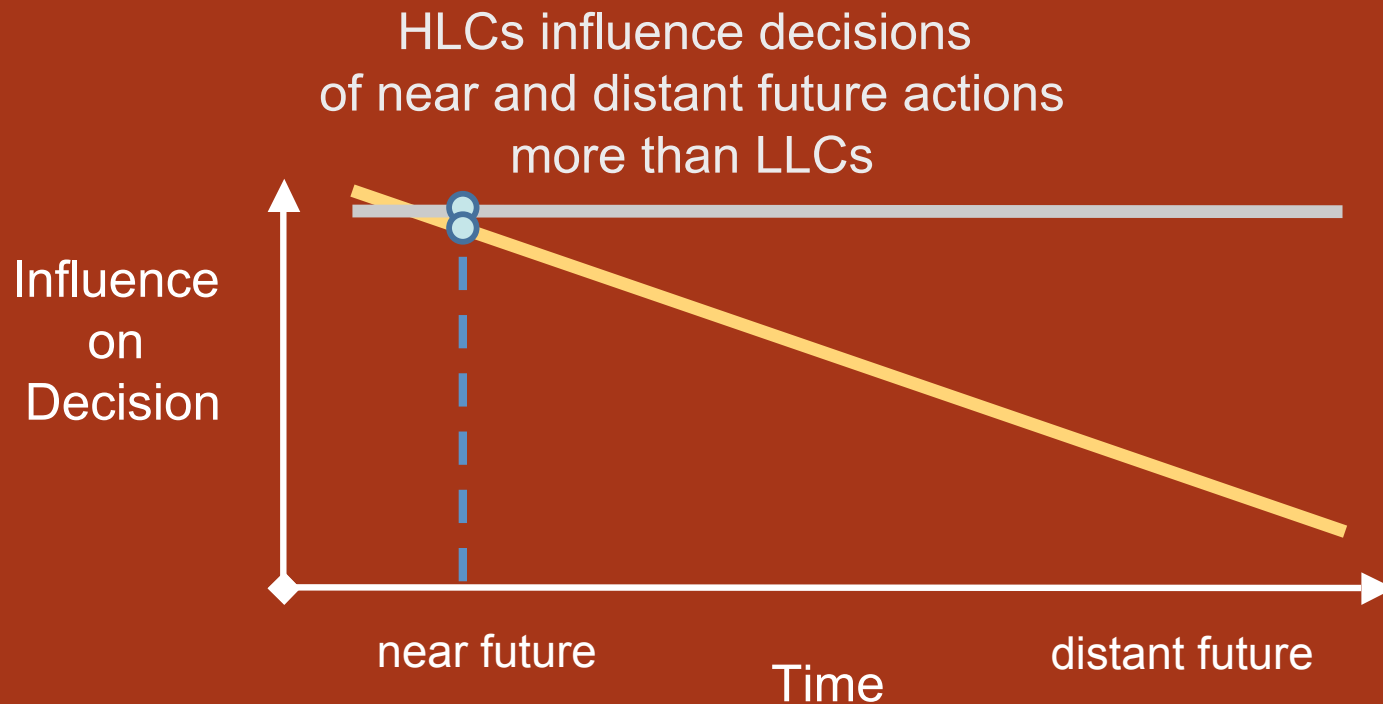
- TCT (Trope & Liberman, 2003) describes how temporal distance systematically changes people's mental representations and associated valuations of future events
 - Events in the distant future influenced more by **HIGH LEVEL CONSTRUALS** (HLCs)
 - Events in the near future influenced more by **LOW LEVEL CONSTRUALS** (LLCs)

High-level construals (HLC)	Low-level construals (LLC)
Abstract	Concrete
Simple	Complex
Structured, coherent	Unstructured, incoherent
De-contextualized	Contextualized
Primary, core	Secondary, surface
Superordinate (“why”)	Subordinate (“how”)
Goal relevant	Goal irrelevant

VISUAL INTERPRETATION OF TEMPORAL BIAS



THE HYPOTHESIZED EFFECT OF FEEDBACK



THE NATURE



NATURE AS PART OF FEEDBACK STRATEGY

- Humans have strong emotional and symbolic associations with nature
- Nature triggers both larger, abstract values and more immediate, emotional responses
- Incorporating images of nature into feedback strategies may
 - be a powerful motivator for sustainable behaviour
 - trigger behavioural change at a deeper level than prompts and cues alone



HUMAN-NATURE: A COMPLEX RELATIONSHIP

- Social constructionists have shown that highly iconic images of nature can both evoke deep meaning and a sense of separation and helplessness
- Which “**NATURE**” would be most useful in triggering environmental behaviour? Local or distant? Wild or cultivated?



A QUALITATIVE STUDY

- We are conducting a qualitative, exploratory study of responses to nature images
 - Asking open-ended questions about how different images make respondents feel, what they associate each image with, etc.
 - Using selected images based on known responses to similar images also using new, hybrid images



WHAT WE GAIN FROM THIS STUDY

- Be more aware of unconscious messaging, associations with different nature images
- Integrate the results of qualitative study into feedback strategy
- Possibly use in other aspects of CDM* and CBSM** programs



*Conservation Demand Management

** Community-Based Social Marketing

ETHICAL CONCERNS



ETHICAL WORRIES

The explicit aim of CBSM-inspired feedback is to influence behaviour

- This immediately raises worries about **AUTONOMY**
 - At what point do these strategies begin to manipulate behaviour in an ethically objectionable way?
 - If there is a loss of autonomy, can it be justified by appeal to expected gains in well-being?
 - Is CBSM really the best way to change practices?

AUTONOMY

- It seems certain forms of feedback could influence behaviour in ethically problematic ways
 - In ways that undermine individual freedom of conscience and choice
- Tough to say exactly what forms of feedback will cross this line
 - Everyday TV/radio marketing campaigns?
 - Does consent, hypothetical or otherwise, make a difference?
- Based on **LIBERTARIAN PATERNALISM** (Sunstein & Thaler) we set up choice scenarios to encourage good behaviour, while still permitting people to make the wrong choice
 - Controversial as there are worries about slippery slopes



AUTONOMY VS. WELL-BEING

- **IF** CDM and CBSM strategies do in fact compromise autonomy in some cases, what (if anything) justifies the loss of autonomy?
 - The best candidate is *well-being*, either of the individual, the community, or both
 - So the moral justifiability of CBSM requires a substantive thesis on the relation between autonomy and well-being
- That loss of autonomy is capable of being justified by appeal to expected gains in well-being

ADDITIONAL QUESTIONS/CONCERNS

- Are we really comfortable with the idea that appeal to well-being can justify loss of autonomy?
 - Think of the warnings of Orwell, Huxley, Dostoevsky
- Feedback of the sort in question appears to send the following messages
 - If you don't shorten your shower, this is what the world will look like!
 - But of course it's possible that
 - You shorten your shower and the world nonetheless **TANKS**
 - You **FAIL** to shorten your shower and the world is fine
- In both cases any loss of autonomy fails to be justified
- The problem is that **EXPECTED** well-being is supposed to do the moral work

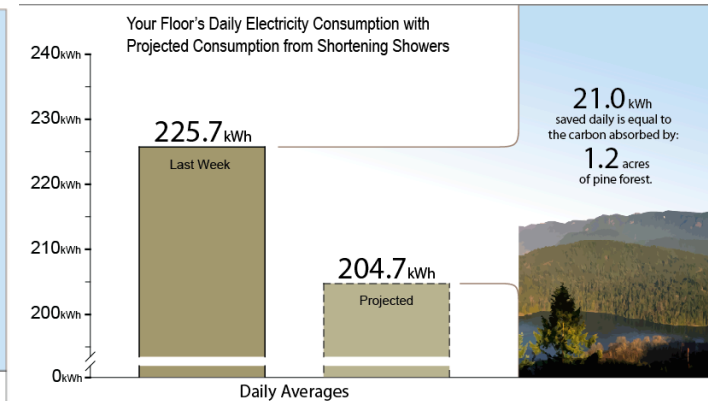
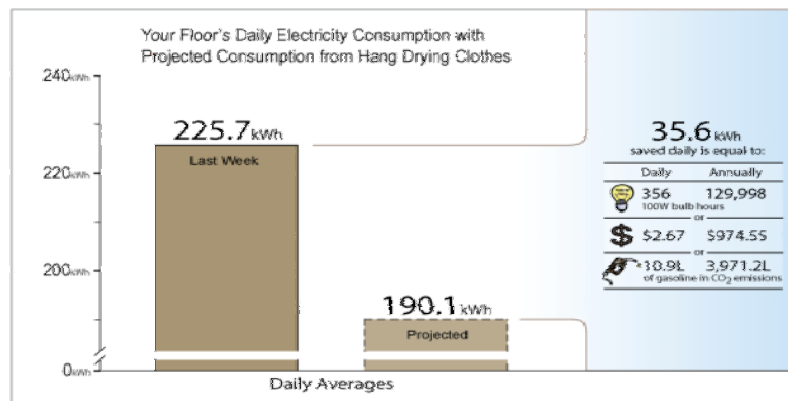
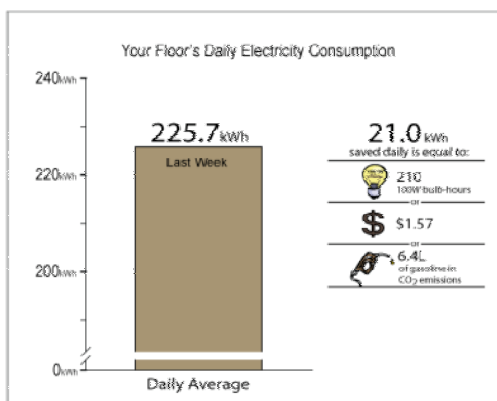
Difficult questions here, e.g., about discounting the future
Also if CBSM is the best way of eliciting pro-environment behaviour!

WHAT ABOUT EDUCATION?

- Proponents of CBSM are usually pretty pessimistic about the ability of education to get the job done
- Is this alleged shortcoming endemic to any and all forms of education?
- Can this be due to a shortcoming in our particular philosophies of education, or in the way we actually teach, rather than in education itself?

THE ACTUAL FEEDBACK EXPERIMENT

- A web-based tool will provide students living in residences with 4 scenarios each suggesting an electricity conservation behaviour to be initiated either tomorrow or next year in their dorm room
- Analysis of data for each scenario at different feedback levels will enable us to test our hypothesis
- Can feedback system using nature images
 - evoke deeper emotions?
 - make HLCs more salient at present?
 - trigger intentions for behavioural change?



“We cannot
live long or well without
a functioning biosphere,
and so it is worth
everything we have.”

Joseph Guth

Director of the Science and Environmental
Health Network



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