TECHNOLOGY DRIVEN BEHAVIOUR CHANGE

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TECHNOLOGY
CHANGES
BEHAVIOUR
OUR BEHAVIOURS ARE MADE TANGIBLE THROUGH OUR INTERACTIONS

- Use of technology has become more ubiquitous and pervasive.
- The opportunity to affect behaviour through technology is vastly increasing.
ARE THESE CHANGES ALWAYS INTENTIONAL?
CAN WE DESIGN THESE CHANGES?
THEORY OF PLANNED BEHAVIOUR

“Attitudes toward the behavior, subjective norms with respect to the behavior, and perceived control over the behavior are usually found to predict behavioral intentions”

THE TRANSTHEORETICAL MODEL

Pre contemplation

Relapse

Maintenance

Contemplation

Determination

Action

CAPTOLOGY

Fogg Behavior Model

B = mat

behavior motivation ability trigger at same moment

High Motivation

Low Motivation

motivation

Action Line

triggers

succeed here

fail here

Hard to Do

ability

Easy to Do

For permissions, contact BJ Fogg
“the roles that computing products play, from the perspective of the user”
TOOLS FOR CHANGE
TOOLS TO INFLUENCE OUR BEHAVIOUR

Provide a simple path to the desired outcome:

• That path supports a desired behaviour.

• Resists undesirable behaviours.

Should we resist undesirable outcomes/behaviours?
INTERACTION WITH TECHNOLOGY IS GUIDED BY AFFORDANCES

Aaron Sloman

Slanty design passively resists certain behaviours
Effective but very hard to achieve
They are static

STROPPY TECHNOLOGIES

Stroppy Technologies are active and dynamic.

They can actively affect selected behaviours:
- resist the undesirable
- support the desirable

They can adapt to the dynamics of more complex human behaviours.

USING MEDIA TO PROVIDE EXPERIENCE

Explore cause and effect relationships:

• Poor behaviours cause bad things to happen

• Good behaviour cause nice things to happen

Technology can provide a safe environment to explore these relationships without significant repercussions.
Gamification of real-world contexts can be powerful.

It allows players to cause and effect unimpeded.

There are possible positive and negative effects.

Bad press - mainly due to unintended affects on behaviour.

But what if we design for behaviour change?

Student Switch-Off, Neil Jennings


Yes, and he says you owe him some caps.
Just hand over the caps, and I'll be out of your way.
I don't deal with junkies. Hand over all your caps. Now!
EXPLORING CAUSE AND EFFECT

• Causality must be clear and apparent.
• Timing is critical.
• It only has to be perceived.
• Correlation is just as effective.
ATTACH A NEW POSITIVE EFFECT TO A DESIRABLE BEHAVIOUR

• Reward a good behaviour.

• Punish bad behaviour?

• Rewards / Punishment must be consistent and persistent.
SMART METERS

• Smart meters have been shown to be effective (5-10%)

• Less effective in the long term

• “Information on its own has a poor track record in achieving energy conservation.”

S. Darby


THE QUANTIFIED SELF
COGNITIVE LOAD

The data challenge

- It's cheap to gather data.
- It's costly to interpret meaning.

Things that can help:

- Data visualisation
- Utilise pre-attentive processing
AMBIENT DEVICES

- Ambient signals can help use perform low cost information filtering.
- David Rose, MIT media lab
- Spawned startup - Ambient Devices
- Provides ambient feedback of household energy consumption.
Ambient Orb.

The Power Aware cord.

SOCIAL PERSUASION
SOCIAL NORMS

• A shared understanding of what is appropriate behaviour.

• Form within groups.

• Can be adopted by and transferred between groups.
BACTIVE

- Mobile application that passively monitors physical activity.
- Uses accelerometer to measure footsteps.
- Groups users with other of similar demograph.
- Provides direct comparison of users performance with average performance of group.
- 151 participants. 64% increase in walking.
- No evidence that social norms had effected this increase.

HUMANS MAKE RATIONAL DECISIONS ABOUT THEIR ACTIONS.
CHANGING BEHAVIOUR REQUIRES A CHANGE IN ATTITUDE
AN ATTITUDINAL APPROACH

Many (most) behaviour change theories rely on a desire or motivation to change behaviour.

This is potentially good news - we can’t be forced to change our behaviour.

However evidence shows that…

“attitude change does not always equate to behaviour change.” B.J. Fogg

The relationship between attitude and behaviour is complex.
RATIONALITY VIEWED AS AN OPTIMISATION PROBLEM

"a person can be said to be computationally rational when the strategies that they choose maximize subjective utility given constraints imposed by their information processing architecture and experience"

“MOST OF THE TIME WHAT WE DO IS WHAT WE DO MOST OF THE TIME. SOMETIMES WE DO SOMETHING NEW”

A habit is a learnt behaviour that:

- is frequently repeated
- has a high degree of automaticity
- is performed in response to stable contextual cues

‘Automatic’ = without conscious awareness

DIALOG HABITS
• An Android application.
• Remote push dialogs to devices.
• The dialog must be addressed before normal use can continue.
IMAGE SELECTOR APP

Project still ongoing… undertaking statistical analysis of results.

- >100 participants.
- >32,000 interactions.
- Control conditions - random images.
- Test conditions - fixed images or fixed positions.

Early results suggest that participants in the test conditions:

- developed a faster response time than those in the control condition.
- are more prone to err when presented with random images.
HOW TO INTERVENE WITH A HABIT

• TRIGGER
• ENACTING OF BEHAVIOUR
• OUTCOME
July 30th, 2013
We waste £68 million a year on overfilled kettles!

Posted by British Gas in Smarter Living

How many cups of tea or coffee do you enjoy per day?
With 40% of people boiling the kettle five times a day or more, Britain’s penchant for hot beverages wastes a total of £68 million in wasted energy!

The Energy Saving Trust, who looked into the energy habits of 86,000 households, also discovered that the average shower lasted seven and a half minutes. If we all reduced this by one minute, the people of Britain could save £215m.

4 July 2013 Last updated at 04:06
Overfilling kettles wastes £68m a year, says report

Three-quarters of British households overfill their kettles, wasting a total of £68m each year, an Energy Saving Trust (EST) report has suggested.

The study of 86,000 households also found that the average shower lasted seven-and-a-half minutes. A minute less would save £215m, the EST said.

Washing clothes at 30C and filling kettles to the required amount were among ways to save money, it added.
HABIT BREAKING STROPPY DEVICE

THE STROPPY KETTLE
The Stroppy Kettle
University Of Birmingham
STROPPY KETTLE V1

A prototype electrical device:

- High power (2500W)
- Used in a Kitchen!

Utilised off the shelf CE or BS certified components.

Heavily dependent upon WiFi connectivity.
STROPPY KETTLE V2

Plug-through 433Mz wireless mains switch

433Mhz transmitter

Load sensor (Kitchen Scales)

Bluetooth radio communication with Android device

Arduino micro controller

Load sensor (Kitchen Scales)
LESSONS LEARNT

Behaviour change theories are exactly that.

- Human behaviours and what motivates/drives them is often more complex than a rudimentary theory can describe.

Be user centric… but not overly.

- If you want to influence someone’s behaviour with an intervention then they might not be the best person to inform design.

Ultimately success can only be measured by a change in behaviour.

- Subjective metrics such as attitudinal changes do not constitute confirmation of an effective behaviour change.

- Find a way to objectively measure behaviour… and keep measuring it.
THANK YOU

HCI & Habits  
Chris Bowers, Worc  
Ben Cowan, UCD  
Charlie Pinder, Bham  
Russell Beale, Bham  

[Links to websites]