

# CHALLENGING COMFORT & CLEANLINESS NORMS THROUGH INTERACTIVE IN-HOME FEEDBACK SYSTEMS

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## **Abstract**

*This paper discusses the limitations of targeting individual behaviours through information feedback systems without considering the broader socio-technical context in which decisions are made about how people use energy and water. The paper draws on recent research conducted by the author investigating the impact of interactive in-home feedback systems on practices dependent on comfort and cleanliness norms. The research found that although current feedback systems were doing little to challenge bathing, laundering, heating and cooling practices dependent upon these norms, feedback systems could be redesigned to target normative behaviours. This conclusion is made within the context of previous research on social norms which has found that people will be more likely to change their behaviours if they are benchmarked against a wider social group and given approval or disapproval for their current behaviours.*

Previous research shows that personalised feedback can achieve energy and water consumption savings of between 5-15 per cent [6]. However, larger gains have arguably not been achieved because information feedback does little to challenge practices that are deeply ingrained in social and cultural norms.

This paper briefly summarises recent research conducted by the author on the impact of interactive feedback systems on comfort and cleanliness norms, which largely govern practices such as heating, cooling, bathing and laundering. The paper offers preliminary conclusions to suggest how feedback systems can challenge normative practices. This analysis is made within the context of the researcher's PhD, which is exploring how interactive energy and water technologies, such as 'smart meters' and 'in-home displays', influence expectations of comfort and cleanliness in Australian households.

The research discussed involved a range of ethnographic methods, such as interviews, household tours, observation and photography, with ten households from South East Water's 'EcoPioneer' trial based in the south-eastern



Figure 1: Ampy Email's EcoMeter

suburbs of Melbourne. The full trial involved 50 households, which each had an Ampy Email 'EcoMeter' in-home display system (see Figure 1). The EcoMeter plugs into any power point in the home and displays the household's energy, water and gas consumption in real-time. The research aimed to understand how feedback systems affect expectations of comfort and cleanliness, and how they could be re-designed to challenge these norms more strongly.

Normative behaviours are those which sit beyond the realm of questionable practice [13] and are so deeply ingrained in the routines of daily life that education alone will not result in their reconfiguration [9]. This is despite the fact the histories of everyday practices such as laundering, bathing, heating and cooling show dramatic variations in what is considered 'normal' [1, 4, 5, 11, 18]. For example, while a weekly bath was recently the norm, this has been replaced by daily or more frequent showering. Similarly, comfort practices such as opening windows, cooling the body with water, using blankets and appropriate clothing, or building thermally efficient housing, are being replaced by heating and air-conditioning [13].

Although many other norms influence individual behaviours, water and space heating and cooling (comfort norms) constitute almost 60 per cent of Australians' energy demand in the home [7]. Similarly, the bathroom, toilet, laundry and kitchen (cleanliness norms) constitute 70 per cent of an average household's water consumption in Melbourne [12]. However, governments, utilities and conservationists have been reluctant to challenge these norms. Shove [13, p. 17] argues that this is because 'comfort and cleanliness constitute fine examples of non-negotiability, their meaning and importance being quite simply taken for granted.' The EcoPioneer research supported Shove's conclusion and attributed the lack of change in these norms resulting from the provision of feedback to two factors.

Firstly, the research found that householders either didn't understand or misunderstood the connections between the consumption data provided through the EcoMeter, and their own practices. They were left to answer questions such as: what practices does this figure on my screen relate to? And, is this figure appropriate or inappropriate for the tasks I have just undertaken? This problem is related to the way the consumption data was provided to participants, which was in the units of kilowatts, kilolitres and greenhouse gas emissions. Providing raw consumption data to householders assumes that they can understand and translate this information into energy and water services, such as air-conditioning, heating, lighting, showering, cooking and computer or TV usage [13, 14, 18, 20].

Secondly, the practices made possible by energy and water are set within wider social and cultural norms governed by notions around what it means to have a clean body, clothes or house, or to be comfortable in any given society or culture [13]. Feedback systems generally target the individual, rather than this larger context in which a household is situated.

Therefore, where householders had made the connection between their consumption data and practices, they did not necessarily consider these tasks to be negotiable or changeable. Instead, they often tried to improve the practice by changing the technologies used for the task. For example some participants changed to water-efficient showerheads or energy-

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efficient light globes (provided to all participants taking part in the EcoPioneer trial). Similarly, most participants made small efficiency changes to their practices such as taking shorter showers, doing full loads of laundry, or turning off lights and standby appliances. However, feedback rarely resulted in fundamental changes to householder norms around what it means to be clean or comfortable. Residents rarely showered or washed their clothes less, or suddenly tolerated a larger band of temperatures, although some did use the heater and air-conditioner less.

The non-negotiability of these practices can be attributed to two main factors. Firstly, many people shower once or twice a day and wear fresh clothes everyday because they believe society expects them to, and because this expectation becomes habitualised into daily life. The thought of embarrassing or disrespecting oneself by wearing dirty clothes or giving off body odour is generally reprehensible, and indeed many people find their own body odour repelling, although this has not always been the case [13].

Secondly, comfort and cleanliness expectations are being ratcheted upwards by a whole range of actors. For example, heating and air-conditioner manufacturers, electricity providers, governments, fashion designers and builders are all involved in both directly and indirectly promoting artificially-produced comfort [13]. People conform to these escalating expectations and come to regard them as normal, rejecting former and alternative ways of achieving them.

Providing isolated information to households about their energy and water consumption therefore falsely assumes that people can meaningfully translate this information into practices and make autonomous decisions to substantially change them independently of their social context [18]. These findings confirm the views of several other authors [2, 15, 17, 19], who argue that individuals are not always free to act on information that is provided to them. Instead, individuals are constrained and influenced by technologies and infrastructures around them, the way resources are provided, and the social and cultural norms of the society they live in. While the EcoMeter encouraged participants to make small changes to the technologies and infrastructures in their homes, it rarely challenged their expectations of comfort and cleanliness.

Feedback systems could be redesigned to challenge these norms in a number of ways. Firstly, feedback systems should encourage greater social interaction, both within and beyond the household, by improving the prominence and visibility of the in-home display system. Social interaction around the EcoMeter was already occurring in some of the homes visited, and this encouraged debate about everyday practices such as laundry and showering. Within the household, it gave the members with lower comfort and cleanliness expectations (mainly males and children) the opportunity to challenge householders with higher expectations (mainly females), who tended to dictate the overall standard of the household.

Having the in-home display in a prominent position can also encourage discussion about practices that depend upon social norms with people visiting the household, such as what each person would or would not be willing to change to achieve a reduction in energy and water

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use. Several interviewees reported this occurring as a result of the EcoMeter and noticed that householders with high expectations of comfort and cleanliness tried to conform to the norms of their peers and family members. While this approach can backfire and reinforce or increase existing expectations of comfort and cleanliness if the social group in question has higher expectations than the target household, the conservation focus of the in-home display biases discussion towards practices that save energy and water.

To reinforce this approach, normative information could be provided through the feedback system. This might involve benchmarking people against a wider social group, such as their neighbours, in addition to indicating some form of approval and/or disapproval for their consumption levels through the display system. Several psychology researchers have tested this approach with great success [3, 8, 10]. They found that people aspire to the norm of any given group they belong to, as well as respond to an approval rating provided by the managers of the feedback system (which reinforces an aspired social norm).

Although this paper has argued that subtle changes could be made to feedback systems to encourage a greater reduction in energy and water consumption, norms are unlikely to change overnight. Feedback systems are still heavily focused on individuals, and largely ignore the wider technological and institutional context in which individuals are contextually situated. For example, feedback systems designed to challenge comfort and cleanliness norms have to compete with the dominance of the shower, the proliferation of air-conditioning, and universal clothing standards in the workplace. Therefore, it would be foolish to promote feedback systems as a ‘solution’ to environmental problems without considering it a small part of a wider socio-technical system of energy and water consumption [13, 16].

## **Author biography**

Yolande Strengers is currently undertaking a PhD research project within the School of Global Studies, Social Science and Planning at RMIT University in Melbourne. Her PhD is funded by the Australasian CRC for Interaction Design (ACID) and the Australian Housing and Urban Research Institute (AHURI). Yolande is supervised by Dr Anitra Nelson and Professor Mike Berry from AHURI Research Centre at RMIT University. She holds a Bachelor of Arts (Deans Scholars Program) from Monash University and is due to finalise a Masters of International Urban and Environmental Management at RMIT University in the near future.

## **Motivation for attending workshop**

Yolande is interested in attending Green Pervasive because the first workshop theme is closely aligned with the aims of her PhD research. In particular, Yolande is interested in understanding how pervasive technologies can assist in challenging normative behaviours.

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