

Preliminary results of two pilot studies

Christine Boomsma, Julie Goodhew, and Sabine Pahl
christine.boomsma@plymouth.ac.uk www.eviz.org.uk

Peak energy demand is a problem for providing energy when resources are diminishing and the energy grid is reaching its limits. Peak use tends to be around 7.30 when people get ready for work or school and around 6pm when people return from work or school. A clear understanding is needed of the current patterns of energy demand to accurately assess the energy contributions made by peak demand, and in turn, the potential that exist for reducing demand (BRE, 2008).

Based on the Day Reconstruction Method (Kahneman et al., 2004; White & Dolan, 2009) an **iPad Energy Diary** was developed. In the diary participants select energy-relevant behaviours they have done during the morning or late afternoon. Questions then examine importance in daily life, behavioural flexibility and perceived energy use.

Benefits and Challenges for Developing an Energy Diary

Data in context

- Diaries build up a picture of when, where and what energy-related activities occur within the household context (Ellegard & Palm, 2011).

True reflections or...

- When collected close to actions diaries can provide reasonable accurate data in a less intrusive manner than methods requiring immediate recording of actions (Kahneman et al., 2004).

Easy to use

- Diaries can be easy to understand and intuitive to use compared to other methods measuring daily energy-related activities (e.g. logsheets).

Cognitive dissonance

- In well-being research participants sometimes report unpleasant activities as more rewarding to justify the time spend on them (White & Dolan, 2009).
- In the current context participants might report an action as important to justify it.

Rich data

- Diaries offer the opportunity to collect rich datasets with many observations per person (Gunthert & Wenze, 2012).

Compliance rates

- Gunthert and Wenze (2012) have raised concern about compliance rates: a sampling bias may occur when only motivated participants provide data.

Technology

- Using new technologies to develop an energy diary offers great potential.

Reactivity

- Diary studies might be particularly sensitive to self-monitoring (i.e. mindful observation of one's own behaviour).
- This can lead to a change in the observed behaviour even though change was not intended or desired (Barta, Tennen & Litt, 2012).

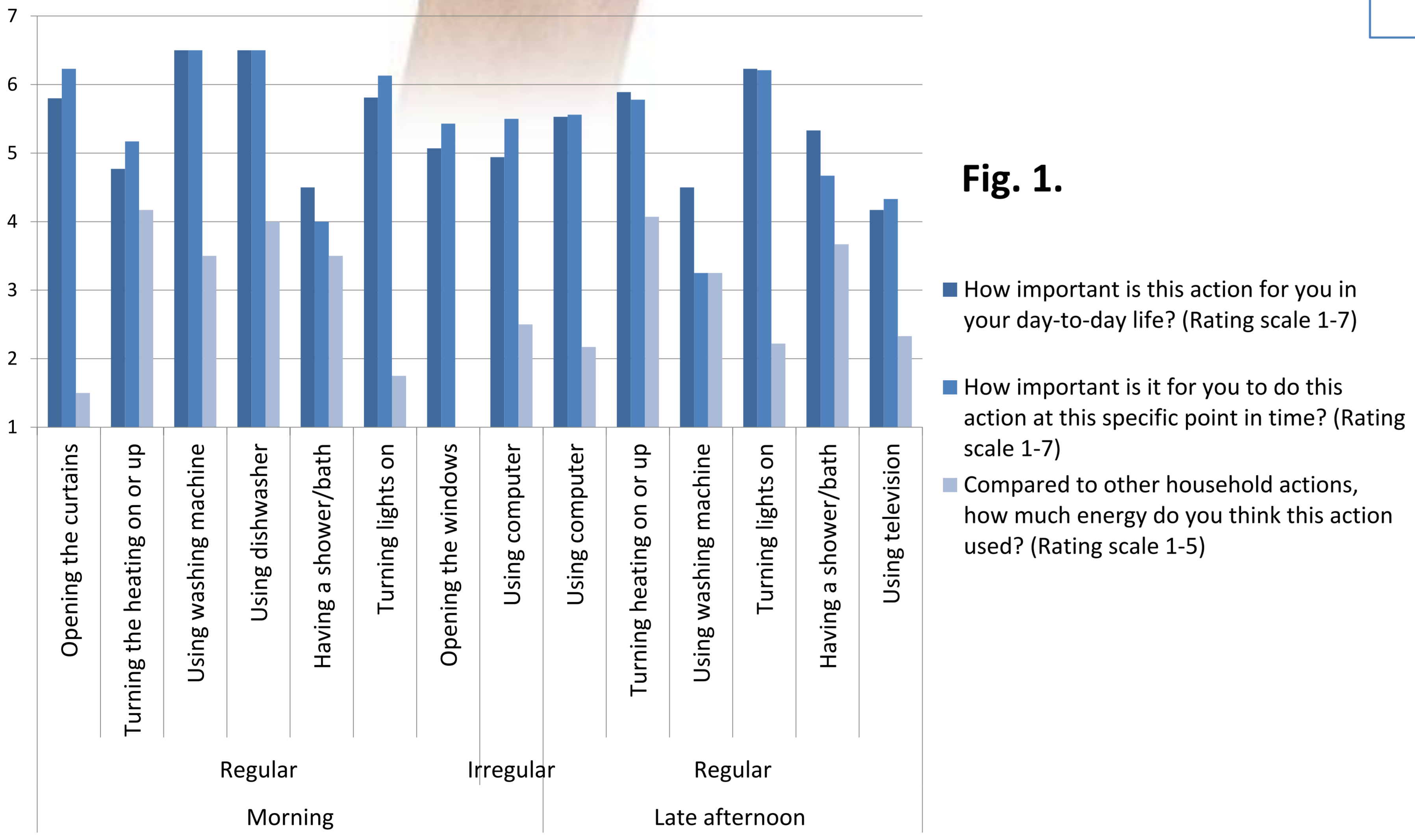


Fig. 2. *"well I imagine the insulation that a curtain offers is kind of a bit of a seesaw you know you can either keep the curtains shut and turn a light on so.. I think there are these sort of cling film type things that you can put on the glass itself which has insulation. So..do net curtains over much insulation?"*

"I could use a lamp? Does a lamp use less energy? no I don't think so. I don't know, there's only one light"

Uncertainty around energy use

"The computer is on all the time but it's not just, so my son is using it and then I come in and use it. And we do switch the screen off on the computer, quite, because it is on a lot so we do at least switch that off [...] It just isn't worth switching it off for 15 minutes or 5 minutes for the next person"

Interactions in the household

"yeah it does cause arguments yeah, not massive arguments, but it does. The children I suppose they're used to a warm house they have had it all their live, whereas me and my partner we're quite a bit older, we're used to houses, you know we grew up in houses with no heating. So we're kind of more used to being cold, whereas they think: we're living in a modern world we shouldn't have to be cold"

Motivations for behaviour

"I suppose it is mostly money related, but yes I'm aware of trying not to be too wasteful. That's the thing, I feel as if, sometimes you walk into the house and it's boiling hot, and it's just silly, it's a waste of money and of energy. I suppose ultimately, I don't know, if energy was really really cheap and electricity and whatever, I probably still wouldn't want to be too wasteful with it, yes definitely, yeah"

"But it is, the problem is because it's quite dark, obviously it's quite dangerous as well because there are lots of stairs three ways up. But yeah, we turn the top one off at night but we leave the lights on in the middle stairs due to, in case of an emergency. That's just an emergency thing, which you could argue [...] It's just a thing, [my wife] feels more save cause the light is on. But otherwise we turn the lights off when we're not there"

Pilot Studies

These are **feasibility studies** in the first instance which had the following aims:

- Explore the diary as a method for measuring specific household actions and to engage people with the topic of energy use.
- Explore the importance and flexibility that people associate with energy-relevant actions.
- Explore whether people have a realistic understanding of relative energy use.

Pilot 1: Feasibility study in three homes

- 3 householders filled in the diary twice a day for 1 week.
- Actions during peak times were rated as regular and important (see Fig.1).
- Only in 19.4% of cases householders suggested alternatives that could reduce energy use.

Pilot 2: Diary as a discussion tool

Pilot interviews (N = 7) were conducted to examine how the diary can trigger conversations about energy-relevant behaviours and can help people reflect on their energy usage. Conversations that came up often surrounded three main themes (see Fig.2).

What have we learned so far? Peak times tend to be dominated by routine behaviours, discourse also reflects habitual behaviours and challenges for behaviour change. The next step is to adapt the diary based on the pilot work and literature. The diary will then be used to examine peak time energy-relevant behaviours in a larger dataset by placing a kiosk in the Plymouth City Council Reception.