Editorial

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Biographical notes: Renee Wever obtained his PhD at Delft University of Technology in 2009. His PhD project was concerned with packaging design for durable consumer goods, especially consumer electronics products. Besides his PhD project, he was involved in other packaging-related projects, one of which was concerned with the prevention of litter through packaging design. Through this project, he became involved in the field of 'design for sustainable behaviour', in which he has since published multiple articles. He currently works as an Assistant Professor in the Design for Sustainability group at Delft University, Faculty of Industrial Design Engineering.

1 Introduction

For better or worse, products contribute to shaping the behaviour of their users. Hence, designers have the opportunity, or if you are so inclined the responsibility, to take those potential behaviour changes into account in their design process. Through thoughtful design, they may aim to change user behaviour for the better and make it, for instance, more sustainable.

Such design, aimed at enabling, inducing or even forcing users to behave in a more sustainable manner, is the topic of this special issue. It deals with the intersection between the disciplines of design, behaviour and sustainability. This intersection constitutes a research area that has grown considerably in recent years especially amongst design researchers (e.g., Lilley, 2009, Lockton et al., 2008, 2010). Although aspects of it have been covered in the extant literature earlier, the specific combination of the three aspects design, sustainability and behaviour, in combination with the researchers coming from a design background, is relatively new.

This special issue is based on papers presented in a special session during the 14th European Roundtable on Sustainable Consumption and Production (ERSCP) Conference, which was held in Delft, the Netherlands, in October 2010. In this editorial, these papers will be put in a wider context to illustrate how they relate to each other, as well as to other recent publications in this emerging field of research.

2 Influencing behaviour

The notion of designers wanting to change user behaviour in order to improve the world, society, or the life of their users, is not new. For instance, architects have shown a

tendency in the past to design from their vision for a better world. An example of the rather extreme forms this may take comes from the Amsterdam School, a Dutch architectural movement (roughly 1915–1930) now classified as expressionist architecture. In the catalogue of an exhibition about the Amsterdam School, Venema (1975, p.11) describes the debate among architects within the movement about the level of forcefulness with which the designs of working-class dormitories could change the way these people lived. Some spoke of a paternal-educational approach:

> "One teaches the working class how to live. One teaches them where their table should be placed, where their lamp should be hung, where their bed should stand. And in order to really imprint this on the disobedient, one places the window in the corner, to ensure that the table will be placed there and definitely not in the middle of the room. One screws the lamp hook eccentrically in the ceiling, to ensure that the lamp will not be hung in the middle of the room, and one fixes the bed in a particular corner to ensure that the working class man takes his 8 hours of sleep there, and not where-ever he might prefer himself."
> (Landré, 'De Moderne Woninginrichting', Amsterdam, 1914, cited in Venema, 1975, translated from Dutch)

Venema goes on to quote architect Wijdeveld regarding design choices to make kitchens too small to use as a living space, and to place windows high enough to prevent the women folk from hanging out of the window chatting to the neighbours. "By placing the windows higher, and making them smaller, we caused the working-class folk in their new dwellings, to turn their gaze inwards and enjoy their own home" [Venema, (1975), p.11, translated from Dutch].

To the modern day reader, the paternalistic attitude of those architects would likely be unacceptable, if not shocking. Immediately, it makes us ask ethical questions about what right designers have to intentionally influence and/or educate the users of their products. How far are designers allowed to go and how forceful may they be in attempting to change behaviour in a more sustainable direction? (see also Pettersen and Boks, 2008).

What the example above does illustrate nicely, however, is that designers have a mental model of their users, although in this case it is clearly not a very flattering one. This mental model brings us to the first topic of this special issue, namely the way designers or architects view the potential users of their designs, and how those users respond to the attempts to change their behaviour.

As to the first aspect, how designers view their users, the paper by Lockton (2012, this issue) in this special issue examines these mental models, and how they affect the process of trying to influence user behaviour through design.

Tromp et al. (2011) have contributed to this topic by addressing the opposite: how users perceive the designer's attempt to influence their behaviour. They argue that the (individual) concerns that may motivate a user to change or not change behaviour may be different than the (collective) concerns that triggered the design. "Understanding the relationship between collective and individual concerns, whether they collide or coincide, helps to identify what type of influence and strategies can be effective" (Tromp et al., 2011). Tromp proposes a classification based on two dimensions: 'force' (weak to strong) and 'salience' (hidden to apparent).

3   Design as a variable

Until recently most research on sustainability and behaviour, and the influence that products have on that, was executed by sociologists or psychologists. Of course, even when design researchers execute the research, sociology and psychology still are fields that should feed into 'design for sustainable behaviour'. One of the papers in this special issue [Zachrisson and Boks, (2012), this issue] specifically addresses the learnings that can be drawn from behavioural theories, and assesses which models from those theories are most fitting to a design context, i.e., helpful in making design choices.

Looking at those previous studies, psychology and sociology scientists have taken a different approach to such research as design researchers now do, as they have not fully explored the potential role of design. Such studies (e.g., Jelsma and Knot, 2002; Völlink and Meertens, 2006) are very valuable, but in the selection of the stimuli they seem to under-utilise design as a true variable. Furthermore, these researchers have usually focussed on a single strategy, and not on developing a range of possible strategies combined with pointers for selecting the appropriate one.

4   Research questions

In the current wave of design research into this topic, a wide range of research questions can be observed. Several clusters can be distinguished among these research questions. A first cluster would be the perceptions as described above, with the paper of Lockton.

A second cluster addresses the potential and applicability of design for sustainable behaviour, e.g., in which situations is it a fitting approach and does it have a substantial potential for actual improvement. A third cluster is aimed at obtaining full understanding of (existing) behaviour and translating those insights into design input. The fourth cluster addresses the intervention, i.e., the actual influencing of behaviour through design, and its effectiveness. Cluster one was described above. Clusters two to four will be further elaborated here.

5   Applicability

As said, the second cluster deals with the potential of the approach, i.e., is it a viable design approach in a given innovation context? A first question within this cluster is whether the potential improvement can be quantified up front, and compared to other options for spending R&D budget. This type of questions is part of the work of Elias et al. (2007, 2009), who assess the technical efficiency of home appliances as a benchmark for design for sustainable behaviour.

Another aspect of the applicability of design for sustainable behaviour is whether it is fitting within a given innovation process or culture. Different industries have different innovation methodologies. Some of those will be more fitting to be combined with a design for sustainable behaviour approach than others. Haines et al. (2012, this issue) studied a case where design for sustainable behaviour was integrated into an engineering-focused product development context, to see how well the outcomes of a design for sustainable behaviour process functioned as input for an engineering process.

6   Analysing behaviour

A third cluster deals with gaining insight into existing behaviour. Here, questions are addressed as to which theories (e.g., from psychology and sociology) and tools provide the most fruitful insights from a design perspective. In this special issue, the paper by Zachrisson and Boks (2012, this issue) is entirely focused on this. The other papers provide insights into different approaches, with for instance, Kuijer and De Jong (2012, this issue) exploring practice theory and Van Dam et al. (2012, this issue) utilising a model developed in the field of user-centred design (Van Kuijk, 2010; Wever et al., 2008).

Instead of trying to force users to adhere to pre-designed behaviour (as in the architecture example from the Amsterdam School), several authors in this cluster approach the subject of sustainable behaviour through better understanding of users or inclusion of users in the design process. They work more on the enabling side. This approach has also been termed 'functionality matching' (Wever et al., 2008).

7   Influencing behaviour

The fourth cluster deals with the actual changing of consumer behaviour. Here research is aimed at defining when different design for sustainable behaviour strategies are most applicable, and how effective they are. An open question for designers is how to choose the most suitable design for sustainable behaviour strategy for a given problem. Also, guidelines for the effective execution of given design for sustainable behaviour strategies are in need of further development.

Another question that remains open is that of the long-term effect of interventions. Many studies on the effectiveness of intervention are short-term only. A clear need exists for longitudinal studies, as the few studies on longitudinal effects that have been published so far are not too optimistic about long-term effects. The study on serious gaming by Geelen et al. (2012, this issue) does incorporate an evaluating eight months after the intervention, and again emphasises the limited lasting effect of interventions.

8   Fields of application

Next to different aspects of the innovation process described in these three clusters, studies have focused on different fields of application. Many studies have addressed domestic energy using activities (e.g., Rodríguez and Boks, 2005; Elias et al., 2007, 2009; Wever et al., 2008; Bhamra et al., 2011) or water use [e.g., Scott et al. (2011), on bathing practices; Jelsma and Knot, (2002), on laundry]. Other topics include littering and waste behaviour (Wever, 2006; Wever et al., 2010).

This special issue adds a relatively new topic, namely clothing (Laitala and Boks, 2012). Their paper is, like many of the other papers in this special issue, part of a larger PhD research project, that aims at thoroughly understanding practices in the use phase of clothing; the laundering, mending, handing-down, storing and eventual discarding.

It also elaborates the existing literature on domestic energy use with papers on home energy management systems or HEMS [Van Dam et al., (2012), this issue], gaming as a strategy for household energy conservation [Geelen et al., (2012), this issue] and keeping

warm [Kuijer and De Jong, (2012), this issue]. The work by Haines et al. (2012, this issue) also relates to domestic energy use, but addresses decisions of a more incidental nature, namely home renovations.

9 Future questions

As the research field of design for sustainable behaviour matures, more research questions may come to the fore. One such question addresses the match with the current business context. How will design for sustainable behaviour fit with existing innovation processes in costs, time consumption, and type of activities? Also, the commercial viability of design for sustainable behaviour products remains an issue. What is the cost/benefit ratio of extensive user studies and co-design projects? And, in case of design that is more forceful in its attempts to influence behaviour, are consumers waiting for such products?

Another question for future research is the balance with classical eco-design optimisation. An example of the last can be seen in Wever et al. (2010) studying the application of design for sustainable behaviour strategies to prevent littering. Here some design for sustainable behaviour strategies would call for utilising more material in the design, which would conflict with the classical eco-design strategy of reducing material use. How to deal with such balancing remains an interesting future research topic.

For now, this special issue constitutes a substantial step forward in the field of design research for sustainable behaviour.

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