Behavioural design: A process for integrating behaviour change and design

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Nudge, persuasion, and the influencing of human behaviour through design are increasingly important topics in design research and in the wider public consciousness. However, current theoretical approaches to behaviour change have yet to be operationalized this in design process support. Specifically, there are few empirically grounded processes supporting designers in realising behaviour change projects. In response to this, 20 design projects from a case company are analysed in order to distil a core process for behavioural design. Results show a number of process stages and activities associated with project success, pointing to a new perspective on the traditional design process, and allowing designers to integrate key insights from behaviour change theory. Using this foundation we propose the Behavioural Design process.
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Technology optimisation and removal of choice have long been the basis for technical approaches to changing user behaviour e.g. a heating system that turns off automatically (Greening, Greene, & Difiglio, 2000; Herring & Roy, 2007; Horvath, 2004). However, technical approaches alone are insufficient for sustaining behaviour change, as highlighted by e.g. Lilley (2009). Thus there is a drive to influence users' behaviour through interventions designed into the product e.g. a heating system that provides feedback on energy consumption (Jackson, 2005; Tang & Bhamra, 2008). This is illustrated by the rise of persuasive design (Fogg, 2009a) and the resurgence of unconscious behaviour change research e.g. nudging, in psychology (Kim, Yoon, & Gonzalez, 2012; Thaler & Sunstein, 2008).

Behaviour change theory has been operationalized in a number of specific design process and method propositions. These reflect a spectrum of behavioural strategies; from fully conscious to fully unconscious or combinatory. In this context, strategy describes the overall approach to behaviour change, including deployment, intervention, monitoring, and data gathering (Fogg,

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2009a; Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012). Bringing these areas together, we offer an initial characterisation of *Behavioural Design* as: *designing for antecedent behaviour change strategies using implicit interventions to impact behaviour*. This is complementary to, but distinct from, the range of approaches described by persuasive design or technology (Kelders et al., 2012), and physical removal of choice (Herring & Roy, 2007).

Examining the current state of the art in both design for sustainable behaviour (Bhamra, Lilley, & Tang, 2011; Selvefors, Pedersen, & Rahe, 2011) and persuasive design (Kelders et al., 2012) highlights three key challenges. First, there is little explicit research on, or process support for, the implementation of unconscious strategies. Of the possible unconscious strategies listed Dolan, Hallsworth, Halpern, King, and Vlaev (2014) (e.g. priming and ego), only one is explicitly identified by Selveforset al. (2011). Second, there is little empirical data on the effectiveness of proposed process support in this domain (Bhamra et al., 2011; Kelders et al., 2012). Third, most current design processes focus on realising technologically facilitated behaviour change i.e. technology is used to actively drive the interaction between the user and the behavioural intervention (Kelders et al., 2012). This is in contrast to many unconscious strategies that can also be realised through implicit interventions (DeMarree, Wheeler, & Petty, 2005; Michie, Johnston, Francis, Hardeman, & Eccles, 2008; Tromp, Hekkert, & Verbeek, 2011).

Based on these challenges there is a need for a new process perspective, delivering empirically grounded support to teams designing for unconscious behaviour change. This need is emphasised by both Visser, Vastenburg, and Keyson (2011) and Nurkka, Kujala, and Kemppainen (2009) in their discussions of design for social connectedness and user value perception. Further, the need for support in this domain is particularly significant because of the complexity and variety of unconscious strategies available to the designer (Abrahamsen, Steg, Vlek, & Rothengatter, 2005; De Young, 1993). As such, the goal of this work is to distil a behavioural design process empirically linking process framing, stages, and activities, to successful process outcomes.

As with all design process models the first step in defining Behavioural Design is identifying its core stages and activities (Blessing, 1994; Wynn & Clarkson, 2005). Thus Section 1 examines theory on behaviour change processes as well as current operationalization efforts in the design domain. Sections 2 and 3 then deal with the empirical study. Subsequently, the behavioural design process is synthesised from both the review and the empirical findings in Section 4. Finally, a number of implications for both design research and design practitioners are distilled in Section 5.