Uniting individual and collective concerns through design: Priming across the senses

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This paper contributes to design for behaviour change by testing the potential of priming via everyday products as a means of influencing users and dissolving conflicting individual and collective concerns. Self-construal is introduced as a core explanatory concept with respect to behaviours that unite individual and collective concerns. Two studies are reported. In the first, abstract representations of the target behaviour are elicited and incorporated into subconscious priming stimuli for each of the major senses: sight, hearing, touch, and smell. These primes are then evaluated in a controlled experiment. From these studies implications for both researchers and practitioners are identified. In particular, priming showed a significant effect across all senses.

Keywords: user behaviour, behavioural design, design method, product development, social innovation

This work contributes to the on-going research on design as a means for promoting positive behaviour change (Bloch, 1995; Cash, Gram Hartlev, & Durazo, 2017); and in particular, uniting individual and collective concerns to produce products that are both pro-social and pro-user (Tromp & Hekkert, 2016; Tromp, Hekkert, & Verbeek, 2011). In this context, self-construal provides key insight into how conflicting individual and collective concerns might be dissolved (Cross, Hardin, & Gercek-Swing, 2011; Voyer & Franks, 2014). Self-construal describes '*the relationship between the self and others and, especially, the degree to which [people] see themselves as separate from others or as connected with others*' (Markus & Kitayama, 1991, p. 226). However, operationalizing this in behaviour change has been little addressed in prior works on persuasive design (Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012), or more generally in the design literature. As such, this paper tests the potential of priming building on the logic of self-construal as a means of influencing users through artefact design, and

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more broadly, uniting individual and collective concerns (Kay, Wheeler, Bargh, & Ross, 2004; Kim, Yoon, & Gonzalez, 2012).

Unconsciously influencing the cognitive accessibility of norms connected to self-construal, and subsequently behaviour (Kay et al., 2004), through the physical design of an artefact has a number of advantages over traditional technologically facilitated approaches to behaviour change i.e. approaches utilising a direct intervention component e.g. persuasive technology (Kelders et al., 2012), or physically remove choice (Herring & Roy, 2007). First, unconscious interventions maintain freedom of choice rather than constraining behaviour (Steg & Vlek, 2009). Second, they can be deployed pervasively through the design of everyday products without requiring directed interactions with the user (DeMarree, Wheeler, & Petty, 2005). Third, such interventions can be used to subtly influence pro-social behaviour over the long term (Nurkka, Kujala, & Kemppainen, 2009), without compromising user experience (Tromp & Hekkert, 2016). Finally, despite validation in the psychology literature (van Baaren, Maddux, Chartrand, de Bouter, & van Knippenberg, 2003; Michie, Johnston, Francis, Hardeman, & Eccles, 2008) there is little guidance on how this type of intervention should be manifested in artefact design (Lehman & Geller, 2004; Wood & Newborough, 2003). This is despite the timely calls by Tromp and Hekkert (2016) and Tromp et al. (2011) for designers in this domain to draw on all relevant approaches able to positively address conflicting concerns. Thus, this work addresses a key area complementary to current approaches such as Persuasive (Fogg, 2009) or Behavioural Design (Cash et al., 2017).

This paper experimentally tests the utility of influencing the user through product design, as well as testing the impact of priming the different senses open to interventions of this sort i.e. sight, hearing, touch, and smell. This is supported by a fully realised methodology using two sequential studies. The first transforms abstract associations into tangible design suggestions, while the second examines their impact with respect to a control condition. Throughout, an illustrative sustainability example is used.

1 Background

This section outlines the current state of the art in behavioural design, before discussing self-construal and priming. In addition, the sustainability example used throughout the paper is introduced.

1.1 Behavioural design

The need for behavioural strategies, in addition to technical improvements e.g. making systems more efficient, is determined by three major factors. First, humans are driven by exogenous influences such as incentives and risks, and thus make biased decisions both consciously and unconsciously (Thaler &