Can you have your cake and eat it too? A dilemma-driven approach to design for the early stages of health behaviour change

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Introduction

Responding to rises in lifestyle related diseases over the last decades, we have seen a rapid increase of communication, products and systems designed to support people in adopting healthier lifestyles. Currently, the number of mHealth apps in the market is 172,000 with an average of 4 million downloads everyday ("Mobile health apps", 2017). Communication plays an important role in raising awareness about the necessity of change and mHealth apps and devices can motivate people to adopt and sustain change in health behaviours. However, most of these systems has not yet succeeded in guiding people towards sustained behaviour change (see also Ludden, 2017). Many products and services seem to focus on the middle stages (action, maintenance) within the Transtheoretical Model of Behaviour Change (TTM) (Prochaska & Velicer, 1997), where people have already decided that they need and want to change a specific behaviour (see Ludden & Hekkert, 2014 for a review). However, when it comes to healthy lifestyles, most people are in early stages of change (Kramish Campbell et al., 1999). Therefore, current products and services are often not able to reach the large group of people that has not yet decided that they need to change; the people in the (pre) contemplation stage within TTM.

A distinguishing characteristic of the 'contemplation' stage is that people in this phase gradually become more conscious of their unhealthy behaviour and start contemplating which health behaviour they want to change (and why). A 'process of change' that people reported to have used to progress through the contemplation stage is self-reevaluation (Prochaska et al, 1992) which involves cognitive reappraisal of how behaviour change is part of one's identity. This process has, for example, found to be important for women's decisions to eat more fruit (Chung et al, 2006).

Self-reevaluation relates to self-control processes as proposed by Counteractive Control Theory (CCT), where the latter involves sustaining the pursuit of long-term goals (or personal values that are, for example, coupled to identity) against the motivational pull of immediate desires (or temptations) (Fishbach and Converse, 2011). According to CCT, people can anticipate experiencing self-control dilemmas (e.g., lingering in bed instead

of waking up at a planned time to go running) and devise personal strategies to withstand temptations (e.g., pre-commitment: placing sports shoes next to the bed before going to sleep). Therefore, a way to further zoom in on this complex phase of contemplation and reevaluation is to analyse it through the lens of self-control dilemmas (Ozkaramanli, Ozcan, and Desmet, 2017). The framework of dilemmas, shown in Figure 1, can act as an analytical tool in disentangling the complexity of human behaviour in forced-choice situations. Consider the following scenario: You have decided to eat a less sugary diet. At work, your colleague has brought a home-baked cake to celebrate her birthday. Everyone is having a piece and you feel that, as a good colleague, you should join the celebrations - what if she gets offended if you do not have a piece of her cake? The framework of dilemmas captures the thoughts, emotions and behaviours involved in such dilemmas. Through this, it provides a reflective lens for analysing human behaviour and its underlying motivations (Ozkaramanli, Ozcan, and Desmet, 2017). Based on this analysis, designers can make better informed choices about how to intervene in behaviours. For instance, one way to intervene might be to suggest a kind way to explain the dilemma to your colleague or to suggest having a small bite to taste rather than a full piece of cake. Especially in earlier stages of change, it is important that an intervention (be it a mobile application or a separate device) does not force the user to make “black/white decisions”, but rather facilitates some grey areas that can help people to progress through a process of change. As decisions to make a change are not yet fully internalized, such flexible approaches may prevent falling back. This grey area is included in Figure 1 as an important state between ‘current behaviour’ and ‘new behaviour’ that designers of health interventions should address.

Figure 1. Framework of dilemma's with 'grey area' in between current behaviour and 'new' behaviour.

Although the framework of dilemmas helps unravelling the complexity of human behaviour, it only provides a 'snapshot in time' for a certain behaviour. As behaviour change is a long and complex process (Siegel and Beck, 2014), people might enter and re-enter a stage of change multiple times. Therefore, it is imperative that health behaviour change interventions are adaptive to dynamic user needs and contexts. In the above scenario, for instance, the intervention may at times motivate 'eating a non-sugar diet' and at times allow for 'feeling included in social events' without imposing guilt or shame on the product user. This adaptability also highlights that health behaviour change happens in a system of people, and thus, interventions that solely target individual users may not be as effective as those that consider the social aspects of health behaviour change (see e.g., Toscos et al, Arden-Close & McGrath).

Following the rationale outlined above, we suggest three focus areas that need further study to inform the design of adaptable health behaviour change interventions. We focus our efforts on the domain of healthy eating.

(1) Guided flexibility: guided flexibility appears to be a key factor in long-term behaviour participation (Marcus, et al., 2000). For health interventions, this would entail the user to self-regulate the behaviour (Johnson, F., Pratt, M., & Wardle, J. (2012).

(2) Accounting for emotional gains and losses: When designing for behaviour change, an obvious approach may be to emphasize the emotional gains of changing behaviour (e.g., a feeling of pride). Yet, the losses of changing a particular behaviour

(e.g., anxiety or insecurity of moving out of one's comfort zone) should also be taken into account for health interventions to be reasonably realistic.

(3) Dynamics of interventions: dynamics has been found to be a key-concept for user-engagement (O'Brien, 2008). To design more engaging interventions we need to understand how an intervention can dynamically adapt to changes in behaviour and self-evaluation of someone who is actively progressing through a behaviour change process.

(4) To further study these focus areas, we have set out to define research efforts aimed at (1) further understanding strategies and processes that people use to change behaviour (2) designing and testing interventions that incorporate one or more of the focus areas. With these, we aim to define design guidelines that can support people to move through the "grey area" between current and new behaviour.

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