How Can Technology Best Disrupt Bad Health Habits?

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Abstract
Most Behaviour Change Interventions using Technology (BCITs) focus on conscious strategies to change behaviour. However, these do not directly target the source of much behavioural decision-making: the nonconscious. My research focuses on understanding how best to target the nonconscious via mobile devices to achieve behaviour change.

Author Keywords
Behaviour change; nonconscious; mobile; smartphone.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

Introduction
I first completed a literature review of BCITs to identify research gaps. The primary gap is that few BCITs focus on the role of habits, despite the evidence that they structure much of everyday life. Further, according to dual process theories and modern habit theory, habits are not always consciously motivated, chosen or monitored [3,5]. Nevertheless, BCITs tend to employ conscious behaviour change strategies [6]. This gap, together with the pervasiveness of smartphones giving opportunities to deliver behaviour tracking and intervening apps, led me to formulate the following research goal: to apply dual process theory and modern

habit theory to BCITs by exploring the direct targeting of the nonconscious in mobile-based BCITs.

I have further refined my goal to: explore the use of Cognitive Bias Modification (CBM) [7], nonconscious goal priming (NGP) [1] and implementation intention formation (IIF) [4] techniques on mobile devices to achieve habitual behaviour change.

Research questions
My primary research question is: What is the most effective way to deliver nonconscious interventions on mobile devices to achieve habitual behaviour change? This requires consideration of the extent that nonconscious interventions need to be supported by congruent conscious interventions, potentially of the "restricting unwanted behaviour" type we explored in a project to encourage eco-friendly kettle usage [2].

Research approach
For each theory-based approach (CBM, NGP, IIF), I have planned a short-term lab and longer-term in the wild evaluation. The lab studies test the efficacy of interventions on cognitive variables that indicate the availability of habit-related constructs (see [7] for a review of measures) and the in-the-wild studies test whether such interventions impact on actual behaviour.

Remaining research efforts
I am currently refining the lab experiments to test the impact of NGP on smartphones. I am awaiting ethical clearance for a lab & in-the-wild project on the use of CBM techniques on people with hoarding issues, delivered via tablets. I need to finalise my experiment design to explore the use of smartphones in creating effective IIF.

Expected results
For each of CBM, NGP and IIF techniques on mobile devices, I will explore user reactions, determine whether each technique can alter cognitive variables, and demonstrate the extent to which this has an impact on habitual behaviour.

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