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# Persuading The Nonconscious

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## **Abstract**

Most behaviour change interventions using technology (BCITs) try to persuade users to consciously choose to change their behaviour. Based on modern habit and Dual Process Theories (DPTs), we propose an alternative avenue of research in understanding how to use technology to directly target the nonconscious to achieve behaviour change.

## **Author Keywords**

Behaviour change; Persuasive technology; designed persuasion; context-aware; dual process theory; nonconscious; habit.

## **ACM Classification Keywords**

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

## **Introduction**

Many deaths are caused by bad habits or patterns of behaviour [13], while DPTs hold that habits are not consciously motivated, chosen or monitored. We are therefore exploring how to directly target the nonconscious system effectively.

## **Habit theory & DPT**

DPTs commonly assume that human decision-making structures comprise two sets of processes (see [4] for a review). The nonconscious system is a set of fast, heuristic, associative, contextual, automatic processes, while the conscious system is a rational, slow, rule-

based, abstract set of processes with limited resources. Habit is a learnt behaviour that is frequently repeated, has a high degree of automaticity, performed in response to stable contextual cues that act as triggers [9]. Cues may include cognitive constructs like mood [6]. "Automaticity" means habits emanate from the nonconscious system: they are triggered and carried out with minimal conscious awareness or intent [16].

### **Making and breaking habits with technology**

The implication for creating habits using conscious interventions via BCITs is straightforward: prompt the user to perform a desired behaviour in a stable context until automaticity is achieved. The opportunity here for context- and behaviour-aware BCITs is clear. For habit breaking, controlling habit cueing is one possible strategy [16]: BCITs should determine the trigger cue and suggest the user avoid it or remind the user not to perform the unwanted behaviour.

However, the implementation of conscious strategies is not straightforward due to issues with both the user and with the technology. We do not properly understand how users react to being told what to do by BCITs. Users may react adversely [3] and/or fail to attend in time [10]. Further, accurate detection of contextual triggers and behaviour are difficult problems that UbiComp has yet to solve [12].

### **Targeting the nonconscious system**

Our proposed alternative is to target the nonconscious system in two ways: either by priming the nonconscious system to behave in the desired way, or by retraining the nonconscious system to make the desired behaviour more likely.

Firstly, priming rests on research showing that goals can be activated nonconsciously [1] and may even operate nonconsciously [2]. Some related research exists in "glanceable persuasion" [7], but we suggest exploring the use of subliminal priming of simple goal words to avoid the downsides of conscious prompts such as user irritation and reactance [5]. Existing HCI research into subliminal communication [11] tends to use priming to support *conscious* choice. Instead, we propose the exploration of subliminal priming to support *nonconscious* "choice".

Secondly, CBM aims to change learned reactions by practicing alternative paths [15]. Wiers et al. [14] found a small but significant change in behavioural outcomes of alcoholics 1 year after a brief computer training to 'push' unwanted items away and 'pull' wanted items towards them. Use of CBM techniques in BCITs is rare, despite the ubiquity of mobile devices creating opportunities for embedding serious CBM micro games into existing behaviour e.g. unlocking.

Evaluating changes in the nonconscious system is an issue since a habit may take 18-254 days to form [8]. There are multiple implicit reaction time measures of nonconscious system activity [15], but the 'correct' measure for any given experiment is not clear. Ethics is a further consideration: where does the responsibility lie for a user's actions if they are prompted to act via technology acting on their nonconscious system?

### **Discussion**

The suggested strategies (priming and CBM) directly target the nonconscious system to avoid the attenuated conscious behaviour change route, user reactance, and solutions to the problems of behaviour and context

sensing. Many interesting questions remain since we do not yet fully understand the impact that regular primes or CBM training strategies on BCITs will have.

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