



Review

Using feedback through digital technology to disrupt and change habitual behavior: A critical review of current literature

Sander Hermsen^{a,*}, Jeana Frost^b, Reint Jan Renes^a, Peter Kerkhof^b^a Utrecht University of Applied Sciences, The Netherlands^b VU University Amsterdam, The Netherlands

ARTICLE INFO

Article history:

Received 31 March 2015
 Received in revised form
 23 October 2015
 Accepted 13 December 2015
 Available online 20 December 2015

Keywords:

Digital technology
 Mobile and interactive technology
 Feedback
 Behavior change
 Habit change
 Habit disruption

ABSTRACT

Habitual behavior is often hard to change because of a lack of self-monitoring skills. Digital technologies offer an unprecedented chance to facilitate self-monitoring by delivering feedback on undesired habitual behavior. This review analyzed the results of 72 studies in which feedback from digital technology attempted to disrupt and change undesired habits. A vast majority of these studies found that feedback through digital technology is an effective way to disrupt habits, regardless of target behavior or feedback technology used.

Unfortunately, methodological issues limit our confidence in the findings of all but 14 of the 50 studies with quantitative measurements in this review. Furthermore, only 4 studies tested for (and only 3 of those 4 found) sustained habit change, and it remains unclear how feedback from digital technology is moderated by receiver states and traits, as well as feedback characteristics such as feedback sign, comparison, tailoring, modality, frequency, timing and duration. We conclude with recommendations for new research directions.

© 2015 Elsevier Ltd. All rights reserved.

Contents

| | |
|---|----|
| 1. Introduction | 62 |
| 1.1. Habitual behavior | 62 |
| 1.2. Disrupting and changing habitual behavior by self-monitoring and feedback | 62 |
| 1.3. Feedback on behavior through digital technology | 63 |
| 1.4. How feedback works: mechanisms underlying feedback efficacy | 63 |
| 1.5. Factors moderating feedback efficacy | 63 |
| 1.5.1. Interpersonal and intra-personal differences | 64 |
| 1.5.2. Feedback properties | 64 |
| 1.6. Reviewing the effects of feedback delivered by digital technology | 65 |
| 2. Method | 65 |
| 3. Results and discussion | 66 |
| 3.1. Methodological issues | 66 |
| 3.2. The effect of feedback through digital technology on <i>disrupting</i> habitual behavior | 66 |
| 3.3. The effect of feedback through digital technology on <i>durable</i> habit change | 67 |
| 3.4. The effect of interpersonal and intrapersonal differences | 68 |
| 3.5. The effect of feedback technology and properties | 68 |
| 3.5.1. Feedback sign | 68 |
| 3.5.2. Feedback Comparison | 68 |
| 3.5.3. Feedback technology | 68 |

* Corresponding author. Research Group Crossmedial Communication in the Public Domain, Faculty of Communication and Journalism, Utrecht University of Applied Sciences, PO Box 8611, 3503 RP Utrecht, The Netherlands.

E-mail address: sander.hermsen@hu.nl (S. Hermsen).

| | | |
|--------|---|----|
| 3.5.4. | Feedback timing | 69 |
| 3.5.5. | Feedback modality | 69 |
| 3.5.6. | Feedback frequency and duration | 69 |
| 3.5.7. | Feedback presentation: Usability and aesthetics | 69 |
| 3.6. | Other insights | 69 |
| 4. | Conclusion | 70 |
| 4.1. | Further research | 71 |
| | Supplementary data | 71 |
| | References | 71 |

1. Introduction

A variety of digital solutions to help us change detrimental or outdated habitual behavior have arrived on the market. These so-called *quantified self*-solutions, also known as *persuasive technologies*, aim to alter ingrained habits by presenting people with behavioral feedback through mobile and interactive devices and applications. These technologies can help individuals improve their health and the environment by increasing awareness and improving the self-regulation of behavior, something that does not come easily to us. Opportunities to incorporate such technologies in daily life have risen dramatically in recent years. In many nations, a great share of the general populace owns a smartphone or other kind of smart device and seems willing to use technology to change unwanted behaviors. For instance, more than 69% of US citizens track at least one health behavior, with 14% using a specialized tracker (Fox & Duggan, 2012). Manufacturers are jumping on this bandwagon, offering new ways to measure behavior, e.g. through Apple's Research Kit (Moynihan, 2015).

Few of these quantified self-products have been tested in controlled circumstances (Cowan, Bowers, Beale, & Pinder, 2013). Moreover, most solutions lack scientific evidence, with positive anecdotal reports from practice comprising the basis of our understanding (Cowan et al., 2013; Schoffman, Turner-McGrievy, Jones, & Wilcox, 2013). As yet, the potential of digital technology to disrupt and possibly even change habits through feedback on habitual behaviors remains unclear.

This paper addresses this gap in the literature by presenting a review of existing studies on the use of feedback generated by digital technology to disrupt and change automatic, habitual behaviors. This review adds to the current debate by providing an overview of existing evidence, accentuating and addressing gaps in current knowledge and laying an evidentiary foundation for digital technology solutions aimed at habit change.

To do so, we first assess the drawbacks of habitual behavior and the strategies that may be applied to disrupt undesired habits. Second, we then discuss the role of self-monitoring in habit disruption and the role feedback from external sources can play in self-monitoring. In the third section, we look at known influences of feedback efficacy, and consider whether insights into the effect of feedback on habitual behavior in general are valid when applied to feedback delivered through digital technology. Finally, we review findings on the use of digital technology that utilizes feedback and suggest avenues for future research.

1.1. Habitual behavior

In everyday life, habits, commonly defined as "behavior (...) prompted automatically by situational cues, as a result of learned cue-behavior associations" (Wood & Neal, 2009, pp. 580; Gardner, 2014, p.1), help us to come to terms with the enormous complexity of everyday life. However, some of the biggest threats to personal

and planetary wellbeing are direct consequences of our habitual behavior. The cue-response-chain of a strong habit is a rigid structure, which overrides contradictory behavioral intentions (Verplanken & Faes, 1999; Verplanken & Wood, 2006). This may lead to undesired results when cue-response-pairs have a satisfying short-term effect but lead to damaging consequences in the long run, as with snacking or alcohol abuse. Furthermore, since habits do not take into account current context, changed circumstances may render habits unproductive for contemporary life, even though the behavior may have led to rewards in the past.

Because habitual behavior circumvents active consideration of the current context, it is hard to change habits using interventions aimed at controlled processing, e.g. through persuasive messages (Jager, 2003; Verplanken & Wood, 2006). One powerful strategy to disrupt habits is therefore to change the circumstances so that habit cueing does not occur (Verplanken & Wood, 2006) or to alter the external cues that lead to habit execution (e.g. in Aarts & Dijksterhuis, 2003). However, these strategies have practical difficulties, since manipulating or avoiding cues is often impossible (Quinn, Pascoe, Wood, & Neal, 2010) and not always seen as ethical, because receivers may not always consciously notice the manipulations, which places their consequences outside the reach of conscious scrutiny (Verbeek, 2006).

1.2. Disrupting and changing habitual behavior by self-monitoring and feedback

The automaticity of habitual behavior means that execution is often at least partially unconscious and may start without conscious intent (Bargh, 1994). Therefore, one way to disrupt undesired habits is to bring habitual behavior and its context to (conscious) awareness. Self-monitoring, the procedure by which individuals record the occurrences of their own target behaviors (Nelson & Hayes, 1981), enables perception of our own behavior and adaption to the current context. Thus, self-monitoring leads to decreases in unwanted behavior (Quinn et al., 2010).

Unfortunately, self-monitoring is difficult for even the most motivated individual (Wilson, 2002). For example, there is often a discrepancy between self-reported and actual performance, as shown in diverse behaviors such as calorie intake (Lichtman et al., 1992), weight and BMI – especially in overweight participants (Pursey, Burrows, Stanwell, & Collins, 2014), the amount of exercise (Lichtman et al., 1992), actual versus perceived water use (Hamilton, 1985; Millock & Nauges, 2010), and even the reporting of relatively stable personal data such as height (Pursey et al., 2014).

Accurate self-monitoring is greatly improved by personalized information from external sources (Kim et al., 2013; Li, Dey, & Forlizzi, 2010). The intentional delivery of such information about performance or behavior (or about the impact of one's performance or behavior) in order to facilitate behavior change is commonly referred to as *feedback* (Van Velsor, Leslie, & Fleenor, 1997, p. 36). In this review, we adopt the definition of feedback offered by Kluger

Download English Version:

<https://daneshyari.com/en/article/350206>

Download Persian Version:

<https://daneshyari.com/article/350206>

[Daneshyari.com](https://daneshyari.com)