The Aesthetics of Friction: Designing Empathic Technologies for Reflective Behavior Change

Till Maria Jürgens[1,*], Matthias Laschke[2]

[1]University of Siegen, Kohlbettstraße 15, 57072 Siegen, Germany
[2]Rhine-Waal University of Applied Sciences, Friedrich-Heinrich-Allee 25, 47475 Kamp-Lintfort, Germany

Abstract

Behavior change technologies (BCTs) have been extensively implemented to encourage sustainable practices; however, these technologies often depend on persuasion or nudging. Such approaches run the risk of overlooking the psychological complexity of change and may result in an inadequate addressing of users' needs. We argue that BCTs should interrupt resource-intensive everyday routines and cause friction to foster reflection and sustainable transformation. However, poorly designed friction can potentially compromise autonomy and elicit resistance. This position paper proposes a series of empathic design strategies based on the concept of *Aesthetics of Friction*. The findings of our current research project indicate that humor can serve as one empathic design strategy in the design of BCTs. Specifically, humor potentially mitigates resistance and fosters a sense of understanding when interrupting established routines, such as showering. We outline a research agenda that explores the potential of empathy to facilitate reflective, autonomy-respecting, and sustainable behavior change.

Keywords

Behavior Change Technology, Friction, Sustainability, Empathy, Humor, Interaction Design

1. Introduction

There are always reasons to change. Some of these goals are of a personal nature, such as the intention to exercise more regularly or to cultivate intellectually enriching habits like reading. Others are societal in nature, including the reduction of environmental impact or the promotion of more sustainable modes of living. In these contexts, behavior change is often characterized as both desirable and necessary. However, despite its apparent rational appeal, behavior change remains a demanding and often challenging process [1]. It requires that individuals engage in critical reflection on their current practices and, in numerous cases, confront discrepancies between their current self and a more desired or ideal self. This process involves self-regulation, reflection, and the negotiation of internal conflicts. For instance, the ability to resist immediate gratification in favor of long-term goals requires willpower and self-control.

In response to these challenges, the field of Human-Computer Interaction (HCI) has increasingly explored how technology can support behavior change. In the context of concepts such as the Quantified Self (QS) [e.g., 2], Sustainable Interaction Design (SID) [3], and Sustainable Human-Computer Interaction (SHCI) [4], researchers have examined the potential of behavior change technology (BCT) [5] to promote reflection, awareness, and transformation. Approaches such as persuasive technology [6] and nudging [7] frequently serve as starting points for designing interactive systems that initiate, enable, or even enforce behavior change. While the efficacy of these approaches has been demonstrated in numerous contexts, they often remain limited in adequately addressing the lived experience of change and might result in the intention–behavior gap [e.g., 8]. Persuasive technologies, including fitness trackers and home energy monitors, primarily function to provide users with information, thereby raising awareness of performance or consumption. Consequently, they typically delegate the responsibility for change entirely to the individual. The systems inform but do not necessarily understand the user. Nudging

EmpathiCH'26 Workshop Co-located with CHI'26 Conference on Human Factors in Computing Systems, April 13–17, 2026, Barcelona, Spain

*Corresponding author.
till.juergens@uni-siegen.de (T. M. Jürgens); matthias.laschke@hochschule-rhein-waal.de (M. Laschke)
0009-0006-4685-0053 (T. M. Jürgens); 0000-0003-2714-4293 (M. Laschke)

strategies may go even further by subtly restructuring choice architectures, such as defaulting printers to double-sided printing to reduce paper consumption. While these interventions effectively foster behavior change, they often circumvent conscious reflection. Individuals can remain unaware that their behavior has undergone change. Consequently, critical inquiries arise regarding agency, autonomy, and the role of empathy in design.

We argue that the promotion of behavior change requires more than the mere provision of information or the implementation of behavioral steering technology. It calls for an empathic understanding of change as a psychologically complex, identity-relevant, and socially embedded process. We propose a rethinking of BCTs as empathic companions or change agents, such as systems that are capable of recognizing ambivalence, supporting gradual progress, and acknowledging setbacks as integral components of the process.

This position paper invites discussion on how HCI can move beyond instrumental models of persuasion toward more empathic approaches to change. In doing so, we aim to contribute to an expanded understanding of technological intervention, which disrupts established routines and consequently introduces friction, but also acknowledges the psychological depth of change and respects users not only as decision-makers but as evolving individuals. To further develop this perspective, we draw on the concept of the *Aesthetics of Friction* [9]. We understand friction not as a design flaw that should be eliminated. Rather, it is regarded as a deliberate disruption to habitual practices that facilitates reflection. However, friction is often perceived as annoying, patronizing, or moralizing, potentially leading to resistance. Consequently, the design of friction requires careful consideration of the manner in which interruptions are designed and the manner in which they are experienced by the user.

In the following, we outline our research agenda on empathic design strategies. One initial strategy that we hereby present is the utilization of humor. We propose that humor can function as a means to mitigate the emerging resistance and to foster a sense of being understood by the BCT. In addition, we offer an outlook on future work that will explore a range of empathic design strategies, and their potential to make friction bearable and even constructive. As a situated example, we turn our attention to the practice of showering, which is a resource-intensive everyday routine closely tied to wellbeing and privacy. This practice is particularly resistant to change in favor of sustainable behavior.

2. The design of empathic friction

We delineated frictional interaction with technology as a crucial element in fostering sustainable behavior change in everyday routines. Concurrently, friction can provoke negative emotional responses such as resistance. One proposed approach to mitigate resistance is to address empathy in the sense of an understanding technology, so that the user feels seen as a human being. As Silvia [10] asserts, persuasive messages are perceived as less threatening when the communicator is perceived as similar to the recipient. Humor may serve as a means to establish a connection point between technology as the communicator and user as the recipient [e.g., 11, 12, 13]. Previous research indicates that humor may serve to mitigate tension, ease stress, and enhance acceptance of challenging or negative messages [e.g., 14, 15, 16].

Consequently, our present study's objective is to empirically investigate humor as one empathic strategy for designing friction within behavior change technologies. As an initial step of our research project, which is currently under review, we designed a BCT that intervenes in private household showers. The technology provides voice feedback, prompting users to end their shower once a predefined water consumption threshold is reached. Two variants of the intervention were developed and presented as experimental conditions. In one condition, humorous statements such as "Hey. Your towel just told me it misses you already." were employed. We developed the statements based on the Incongruity Theory [see e.g., 14], one of three fundamental humor theories. According to this theory, humor originates from the perception of unexpected or inconsistent situational elements. The statements presented an alternative perspective on shower routines and humorously reinterpreted common behaviors, such as a long and hot shower, through wordplay or exaggeration. In the comparison condition, the

statements were presented as factual, for example, "Shortening shower time can be a good way to save water and energy." In a preliminary vignette study, we investigated how these different designs influenced users' affect and perceptions of the technology. The findings of this study indicate that humor can serve as an effective strategy to mitigate negative affect that results from disruptions to shower routines. Furthermore, a significant difference was found in the construct "feel seen as a human being". Participants exposed to the humorous voice feedback reported significantly higher values on this measure compared to those in the factual condition. The construct was assessed using a set of self-designed items that captured the extent to which participants perceived the technology as understanding and acknowledging the challenges and inconveniences associated with behavior change. Therefore, it can be interpreted as a proxy for perceived empathy in the interaction. We assume that technology that employs humor to encourage users to adopt sustainable practices, thereby demonstrating empathy for their conflicts, will be more readily accepted than those that insist on change in a factual or neutral manner. Qualitative results of a subsequent field study, which was conducted with the assistance of a prototyped BCT installed into participants' homes, suggest that humor contributed to the preservation of autonomy and reduction of moral pressure. The participants described the humorous intervention as inviting rather than patronizing. They reported lower levels of stress during the interaction, while the emerging friction was counterbalanced with a lighthearted tone. The conclusions of this study suggest that humor may facilitate the establishment of an empathic bond between the user and the technology, thereby enabling the acceptance of friction as a natural element of the interaction.

At the same time, it is important to note that humor is not a universal remedy. Several participants exhibited a negative response to the humorous intervention, citing incongruities with their personal humor preferences, situational factors such as negative mood, or the belief that sustainability-related topics should not be addressed in a humorous manner. In such cases, humor may even foster resistance, if the intended empathy is not perceived. The efficacy of humor is contingent upon a nuanced understanding of the audience and the situational context in which it is employed [17].

These findings underscore the need for a more profound understanding of how the qualities of empathy can be utilized in the design of behavior change technologies. Furthermore, the question arises of how these qualities can be operationalized beyond humor. In light of these inquiries, we are currently engaged in the formulation of subsequent studies as our future work.

3. Conclusion and future work

This position paper argues that friction is an essential aspect of the design of BCT, which aims to intervene in everyday practices in favor of sustainable behavior change. However, the friction must be carefully designed to avoid resistance. Rather than minimizing friction or relying exclusively on subtle nudges, we advocate for interventions that deliberately create moments of interruption and subsequent reflection. The crucial question, therefore, is not merely whether friction should be introduced, but rather, how it is shaped and experienced. The presented work suggests that empathic design strategies, such as humor, can mitigate emerging resistance by cultivating a sense of being understood and recognized as a human being.

While we regard humor as an empathic design strategy to design friction, we see it as one element within a broader spectrum. Therefore, our future work will entail the exploration of alternative empathic design strategies within the domain of behavior change technologies. For instance, to underscore the significance of personal agency and to address the needs of users in a meaningful manner, these strategies could include the provision of options for action and the introduction of an active negotiation on eye level between the user and the technology. Another promising strategy could involve the allowance of "cheating", or more specifically, the introduction of intentional design allowances that enable temporary rule-bending. For example, in the case of showering, the intervention could incorporate a way to temporarily increase the water flow in order to enable the final removal of shampoo from hair. This approach would align with the principle that exceptions can help to reinforce established rules rather than subvert them. As this research builds on prior conceptual work on *Aesthetics of Friction*, the objective

of forthcoming studies is to empirically examine how friction is experienced, how it affects reflection, resistance, and behavior change, and how empathic design strategies can shape these processes.

Through this position paper, we aim to initiate a discussion about the potential role of empathic design strategies in frictional behavior change technologies. Additionally, we aspire to initiate a conversation about the implementation of these strategies, including the use of humor, the allowance of cheating, and other facets of empathic strategies, to effectively mitigate resistance, encourage reflection, and promote long-term behavior change.

Acknowledgments

This work was supported by the MOVEN research group, an interdisciplinary group funded by the German Federal Ministry of Research, Technology and Space (01UU2204A).

Declaration on Generative AI

During the preparation of this work, the authors used DeepL in order to: Improve writing style. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the publication's content.

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