

Design Opportunities in Three Stages of Relationship Development between Users and Self-Tracking Devices

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ABSTRACT

Recently, self-tracking devices such as wearable activity trackers have become more available to end users. While these emerging products are imbued with new characteristics in terms of human-computer interaction, it is still unclear how to describe and design for user experience in such devices. In this paper, we present a three-week field study, which aimed to unfold users' experience with wearable activity trackers. Drawing from Knapp's model of interaction stages in interpersonal relationship development, we propose three stages of relationship development between users and self-tracking devices: *initiation & experimentation*, *intensifying & integration*, and *stagnation & termination*. We highlight the challenges in each stage and design opportunities for future self-tracking devices.

Author Keywords

Self-Tracking Device; Human-Technology Relationship Development; User Experience Design

ACM Classification Keywords

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

INTRODUCTION

Self-tracking devices such as wearable activity trackers recently have become more available to end users. As noted in recent literature on smart products [21], emerging self-tracking devices are imbued with new characteristics in terms of human-computer interaction. For instance, the scope of human-computer interaction is not limited to a tangible device itself but includes the services the device provides, such as recommendations for health behaviors. In addition, the contents as well as the value it provides to users will be realized, tailored, and potentially evolve through the use of the device over time based on the ever-increasing data from individual users. While these characteristics imply that self-tracking devices do not simply follow the input-output

interaction, little is known about how this emerging form of interaction between users and self-tracking devices can be described and what should be considered in the design of such smart products.

With this lack in mind, we conducted a study to unfold users' experience with wearable activity trackers. We thought that wearable activity tracker is one of the great examples of self-tracking devices to be studied, because it has been increasingly adopted in the market but also known for high rate of abandonment [9]. From the study, we found that users build an evolving relationship with their activity trackers, which we will describe in three stages. Also, users' experiences at certain stages of the relationship were affected by the quality of social transactions between users and their tracker systems. In this paper, we present three stages of relationship development between users and self-tracking devices by applying an interpersonal communication theory. By doing so, we suggest a new perspective for understanding and designing for user experience with self-tracking devices.

BACKGROUND

User Experience with Self-Tracking Tools

Studies in HCI have led to the understanding of patterns and issues with regard to in situ user experience with self-tracking tools, such as the styles of activity tracking [16] and perceived errors and common pitfalls of tracking and inferring activity data [2, 3]. Recent studies on commercial wearable activity trackers have also revealed novel challenges, such as issues with remembering to wear a device and the aesthetics of devices [18]. While the work by Li et al. [12] is aligned with this paper in a sense that they also discussed how users' interaction with self-tracking tools changes over time, we focus more on unfolding the evolving forms of interaction between users and self-tracking systems, rather than the practices of self-reflection upon which they focused on. In addition, by using an interpersonal communication theory, we introduce a novel perspective for understanding user experience with self-tracking devices, which concerns the development of a relationship between users and self-tracking systems and the quality of social transactions between them.

Social Transactions between Humans and Computers

Even before the recent self-tracking devices, there had been studies that showed how people socially respond to computing technologies by emotionally being involved in systems, treating them as social actors, or by using the norms

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