

Understanding Quantified-Selfers' Interplay between Intrinsic and Extrinsic Motivation in the Use of Activity-Tracking Devices

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Abstract

Interest in consumer tracking devices that measure movement to help consumers track and understand their daily activities has rapidly increased in recent years. Although a few studies have focused on the use of fitness tracking devices, we know little about how users' existing motivation is complemented by motivation externally created from the device or how interplay between this external motivation and preexisting internal motivation of users affects use of the device over an extended period of time. We conducted semi-structured interviews with 15 research participants to understand the multidimensional nature of motivation that shapes the long-term use of technology and its effects, and we found that Quantified-Selfers may have distinct motivation to use tracking devices. In the next step, we plan to conduct a comprehensive analysis of the Quantified Self online forum in order to explore Quantified-Selfers' intrinsic and extrinsic motivations for using the device and tracking their activity data.

Keywords: Physical activity-tracking devices; intrinsic motivation; extrinsic motivation; quantified-selfers

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1 Introduction

Wearable health and fitness tracking devices have recently proliferated to help people manage their health and wellness by quantifying their physical movements. The market is witnessing an emergence of various commercial wearable devices (e.g., Jawbone Up, Nike Fuel, Fitbit, and Garmin VivoFit) that employ accelerometers to track a user's movements, including general activity, steps, calories burned, and sleep throughout the day. It is argued that these technologies promote healthier behaviors by making these data visible. However, recent studies indicate many such devices fail to deliver on health benefits in the long term. For example, a 2013 survey of thousands of adults in the United States revealed that more than half of the self-trackers no longer used their tracking devices, and a third of those stopped using the device within six months of receiving it (Ledger & McCaffrey, 2014). Ledger and McCaffrey (2014) provide one possible explanation, emphasizing that activity trackers can provide data but may not inspire many users to be active. That is, data provided by these technologies are not sufficient to motivate users, and other motivators are needed. Our premise is that a user-centric analysis is equally important in examining long-term technology use (Dillon & Watson, 1996). Therefore, understanding what currently motivates users to continue using the device and, in the case of tracking devices, to derive motivation from it is important (Wendel, 2013).

In the context of wearable health-tracking devices, a few studies have focused on the motivation created by the device and how the technology affects users' behavior (e.g., Consolvo et al., 2008; Munson & Consolvo, 2012). But these have not examined the user's preexisting motivation and how this form of motivation is at interplay with motivation created by the device. To this end, to address the limitations of previous research, we analyzed qualitative interviews with 15 users of activity-tracking devices to explore users' intrinsic and extrinsic motivation in using the devices and how they interplay over an extended period of time.

2 Methods

The data collection procedure included a focus group and semi-structured interviews with 15 research participants who were selected based on the adoption of Fitbit devices and their willingness to share their experiences and thoughts. Participants had a wide range of experience with tracking physical activities before getting the Fitbit device, from mentally tracking activity and manually recording it to using other tracking technologies. All the participants were interviewed face-to-face, and interviews lasted between 45 and 60 minutes. The interview protocol included questions about (1) their primary motivations for adopting Fitbit, (2) the general ways the participants used the device, (3) the type of information they

obtained from the device and how they made sense of it, and (4) potential changes in their behavior or perception as a result of using the device. Qualitative analysis was done using open coding, a standard method for analyzing interview data.

3 Findings

As shown in Table 1, data analysis of the self-assessments of the participants gave rise to two main categories of participants' activity level: (1) already physically active and (2) inactive and mostly sedentary. A synthesis based on the concepts of intrinsic and extrinsic motivation further divided these groups into 4 subgroups of participants mirroring disparate relationships between forms of motivation and Fitbit use (Table 1). Intrinsic motivation refers to the internal drive to satisfy the basic psychological needs for competence, autonomy, and relatedness (Consolvo et al., 2008). Extrinsic motivation refers to the tendency to perform activities for known external rewards, be they tangible (e.g., medals or financial rewards) or psychological (e.g., praise) in nature (Karageorghis & Terry, 1969).

Current activity level	Motivation (Intrinsic vs. Extrinsic)		
Already active Perceive their lifestyle as active	Group1	Intrinsic Motivation for physical activity: Yes Primary motivation for adoption: curiosity about the device and their own activity patterns	Extrinsic Motivation from Device: No <ul style="list-style-type: none"> ▪ Device does not motivate them and change their behavior ▪ Fitbit provides no extrinsic motivation for extra activities
	Group2		Extrinsic Motivation from Device: Yes <ul style="list-style-type: none"> ▪ Device motivates them to increase level of their physical activities ▪ Fitbit creates extrinsic motivation and complement their intrinsic motivation
Not active Perceive their lifestyle as not adequately active	Group3	Intrinsic Motivation for physical activity: No Primary motivation for adoption: curiosity about the device and their own activity patterns	Extrinsic Motivation from Device: No <ul style="list-style-type: none"> ▪ Device does not motivate them and change their behavior ▪ Fitbit provides no extrinsic motivation for extra activities
	Group4		Extrinsic Motivation from Device: Yes <ul style="list-style-type: none"> ▪ Device motivates them to increase or maintain current level of physical activities ▪ Fitbit creates extrinsic motivation and complements their intrinsic motivation

Table 1. The physical level and primary motivation of four different groups.

4 Next Step

By examining individual differences in adoption behavior, we found that one of the participants, as a Quantified-Selfer (Q-Selfer), may have different forms of motivation for using tracking devices. Q-Selfers are individuals who analyze and track data about many things, from their diets to their sleep habits, in order to optimize their lives. Although many people do not routinely track their personal data, Q-Selfers are notable exceptions, as they diligently track many forms of data about themselves (Choe et al., 2014). They typically dedicate a remarkable amount of time and effort trying to generate more personal data and to figure out how to do so more effectively and efficiently (McFedries, 2013). What made the use of the device by this participant distinct were the following:

- 1) Constantly seeking more accurate ways to measure movement, blood pressure, and eating behaviors using various devices and mobile applications. This propensity made him eager to compare different devices.
- 2) Being fascinated with data generated about his activities.
- 3) Being more open to sharing personal data on social media platforms.

We found that his intrinsic motivation to use the device was quite different from that of most other participants; he tracked data about many factors. In particular, this motivation was clearly different from those driving the use of the device in the case of groups 1 and 3, as shown in Table 1. Most participants from groups 1 and 3 seemed to have learned adequately about their routine physical activities, and their

information about these became redundant, commonly leading them to stop using the device after a certain period of time. In contrast, the participant, considered a Q-Selfer, was not concerned about iterative information patterns. For these reasons, we speculate we may find a different balance between intrinsic and extrinsic motivation in Q-Selfers and in their influence on Q-Selfers' use of activity tracking devices. In the next step of this study, we focus on Q-Selfers' intrinsic and extrinsic motivations and how their preexisting motivations bear upon motivation arising from the use of the device.

To explore Q-Selfers' inclinations and characteristics as intrinsic motivation, we have explored the 30 most popular posts on the Quantified Self online forum (<https://forum.quantifiedself.com>) in relation to the use of activity tracking devices, which contains contributions from self-proclaimed Q-Selfers. Our analysis indicated that similar to our Q-Selfer participant, contributors to this online forum tended to exhibit 3 common characteristics: (1) data-orientedness: they discussed missing data, data formatting, and how to manage tracking data; (2) the use of different tracking devices and applications to find more efficient methods to track and manage their data; and (3) being relatively open to sharing personal tracking data publicly.

5 Conclusions

We found that Q-Selfers may have distinct motivation to use tracking devices; thus, their personal characteristics may have added another dimension to our early findings (Table 1). In the next step, we plan to conduct a comprehensive analysis of the Quantified Self online forum in order to explore their intrinsic and extrinsic motivations for using these devices and tracking their activity data. We plan to compare this analysis with data collected through interviews. This comparison will help us discover how the distinct intrinsic motivation of Q-Selfers may affect the findings demonstrated in Table 1.

6 References

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