Personal Health Tracking Technologies in Practice

Nanna Gorm

IT University of Copenhagen
Rued Langgaardsvej 7
2300 CPH S
Nanj@itu.dk

Abstract

Personal health tracking technologies are becoming increasingly popular, both at individual level and as part of health promotion initiatives in the workplace. Workplace health tracking in particular has caused concerns of increasing surveillance of employees, simplification of health to numbers causing negative financial and personal implications to employees. So far, however, research has looked mainly at short-term, self-motivated tracking, or at workplace health and wellness programs that do not offer activity tracking. In my thesis I focus on everyday uses of activity trackers, as these are commercialized and implemented at home and in the workplace. I present findings from three empirical studies of wearable health tracking technologies in practice, questioning the underlying assumptions of activity tracking.

Author Keywords

Doctoral consortium; self-tracking; workplace; surveillance; health and wellness programs.

ACM Classification Keywords

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

Background

'Self-tracking' refers to keeping track of for example health indicators such as weight, sleep or exercise routines, in order to better understand ones habits or to improve health levels [8]. Many simply keep track "in their head", however, technology supported self-tracking is increasingly common [3]. Wearable devices, such as Fitbit, Jawbone and Applewatch, track the users' physical activities, and then transfers the data to the cloud before displaying results to the user on their dashboard [12]. One industry report asserts that one in five American adults now own a wearable device [13].

Activity tracking is also increasingly introduced as part of workplace health and wellness programs [10]. Research suggests that by 2020 enterprise costumers will order 27.5 million devices, going up from 166,000 devices in 2013 [11].

Introduction

Within recent years, wearable devices have been implemented in workplaces in a variety of ways, ranging from being used in short term step-counting campaigns to long-term health promotion programs where technology supported self-tracking is a part of reaching the goals of the program. Employees who use tracking devices as part of health promotion initiatives in the workplace are sometimes rewarded with prizes or company swag, and in the US employees might also receive a discount on their workplace health insurance if they live up to the set goals [10].

Researchers have highlighted that the use of consumer tracking products remains understudied [14]. At the same time, little is known about workplace implementations of activity tracker use and the kinds of experiences and concerns employees might have when engaging with these technologies in practice [14]. Despite relatively little research on the specifics of practice around activity tracking technologies, we are now seeing many assumptions that these devices, once implemented, will lead to improved health [6]. Others, however, warn of increasing surveillance of employees, simplification of health to numbers, causing negative financial and personal implications to employees [2]. What we are seeing is a rise in what Lupton has called "pushed" self-tracking [7]. This means that others have incentivized or encouraged the user to do self-tracking, whereas most research so far has looked at "private" self-tracking.

Using self-tracking devices at work is not *"critical to getting things done"* [1], as they are not connected directly to work tasks or projects at the moment. Even so, as my empirical research has shown, these devices hold the potential to influence the workday of employees, both those who use the devices and those who do not [4]. As such, I suggest that more work is needed to better understand the development of activity tracking practices in the workplace. In my dissertation I therefore investigate what role activity trackers play, as these are introduced and appropriated. I wish to contextualize this development by seeing "pushed" self-tracking in relation to "private" self-tracking. The goal of this research is to question the assumptions surrounding what end users will do to benefit from using their activity tracking devices in both types of practices. By doing so, this dissertation contributes to discussions of the design of future health tracking technologies and recommendations for policy implementation in the workplace and beyond.

Research question

This thesis work seeks to analyze and contextualize the development of wearable health tracking technologies. I pose the following research question:
How is "pushed" self-tracking integrated into workplace practices in contrast with "private" self-tracking?

Research Design

This research presents findings from three separate empirical studies, each seeking to provide different, yet complimentary, insights into self-tracking in practice.

First, I conducted observational studies in a Danish workplace participating in a workplace based, three-week, step-counting campaign [4]. Participants spent considerable amounts of time figuring out, on their own and in conversation with colleagues, what constituted a step, and what was a "fair" overall step count. These

Photos from participant driven photo elicitation study

"This photo is from a walk in the sunshine. Several days ago… The news factor is wearing off (…). The Fitbit is in the closet both Monday (forgotten) and today, Tueday, where I chose not to wear it" (Photo and e-mail from particpant)
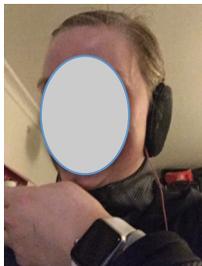
"I had forgotten my charger (…) It's almost as if it doesn't count when it's not registered;)" (Photo and e-mail from participant)

negotiations demanded moral choices and social negotiation between colleagues. The step-counting campaign influenced workdays of both campaign participants and non-participants. Even though participants generally went back to their prior habits at the end of the campaign, we argue that the campaign was successful as a form of health promotion, in that it was part of a broader initiative to support healthy living, and it allowed participants large degrees of control of their form of participation [4].

The workplace step-counting campaign provided some insights into "pushed" self-tracking in a certain context. Understanding this in relation to "private" self-tracking proved difficult because most studies in this area are short-term, focuses on first-movers (Quantified Self-community) or introduce only researcher-selected technologies. The lack of long-term studies of self-initiated tracking might in part be because studies of self-tracking practices are challenging. Users might only glance at their tracker a few times during the day, checking sleep stats in the morning while still in bed, or perhaps considering step counts while walking to the next meeting, making it difficult to do observational studies in the traditional sense, especially as I wished to have a broad variety of participants. To overcome this challenge I built on the methods of participant driven photo elicitation study for the second empirical part of this thesis work. 25 Danish participants took photos of their "private" self-tracking experiences over the course of 5 months [5]. I found that participants had idiosyncratic ways of using their trackers, and although this was often characterized by being episodic, they still found value from tracking. Continuous use, which is often seen as the gold standard of tracking, was at times detrimental to health, causing users to

feel a loss of control. I suggest that episodic use is a feature of self-tracking, not a bug. This finding questions the underlying assumptions of activity tracking and holds implications for how we imagine future wearable technologies should be designed and implemented.

The third and final empirical part of the thesis work consists of a three-phase interview and survey study. 21 US employees and program administrators were interviewed about their experience with "pushed" health tracking in the workplace. Emergent themes created the basis of a survey distributed amongst US employees, with more than 500 responses from employees and 45 from program administrators. Employees had many positive experiences, however, many considered that what was offered in their health and wellness programs in terms of tracking was too far removed from what they actually wanted and felt could support their health. At this point, health tracking was often a burden that fit awkwardly with personal health practices. Program administrators sought to develop programs with holistic view of health, but this was not simply supported by what was easily tracked and thereby incentivized. In future deeper analyses of this work I will further investigate the implications of these findings to the development of future wearable technologies.

Progress to Date and Expected Contributions
At this point all three empirical studies have been conducted and initial rounds of analysis have been concluded. Building on these three sets of empirical research I investigate how we can understand "pushed" self-tracking in relation to "private" self-tracking, and contribute to CSCW field of research by improving our

understanding of what role wearable health tracking technologies play at home and in workplace settings.

The excited rhetoric around health trackers makes for many assumptions about the ease and obvious applicability for promoting healthier practices. However, as Maitland highlights; *"Life is not a behavioural change programme"* [9]. Outcomes of the research at hand will deepen our understanding of the lived experiences of activity tracking, as these devices are increasingly commercialized and brought into private as well as workplace settings. The findings of my dissertation will be important for the design of future health tracking technologies and for recommendations for policy implementation in the workplace and beyond.

Expected Benefits from Participation in CSCW Doctoral Colloquium

The CSCW Doctoral Colloquium will take place during the last year of my PhD study, and as such the Colloquium presents itself as a great opportunity to discuss the challenges of understanding my empirical findings in a broader perspective. I believe the Colloquium will provide feedback on how to best refine and present the arguments of the thesis. I hope to gain constructive feedback, inspiration and engage in discussions during both the Colloquium and the conference.

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