# Sharing Steps in the Workplace: Changing Privacy Concerns Over Time

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## ABSTRACT

Personal health technologies are increasingly introduced in workplace settings. Yet little is known about workplace implementations of activity tracker use and the kind of experiences and concerns employees might have when engaging with these technologies in practice. We report on an observational study of a Danish workplace participating in a step counting campaign. We find that concerns of employees who choose to participate and those who choose not to differ. Moreover, privacy concerns of participants develop and change over time. Our findings challenge the assumption that consumers are becoming more comfortable with perceived risks associated with wearable technologies, instead showing how users can be initially influenced by the strong positive rhetoric surrounding these devices, only to be surprised by the necessity to renegotiate boundaries of disclosure in practice.

## Author Keywords

Step counting; wearable technologies; workplace practices, privacy

## ACM Classification Keywords

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

## INTRODUCTION

Excitement around the potential that data derived from wearable technologies represents drives research efforts, health promotion campaigns and even workplace policy implementations. In 2014, 10,000 companies in the US offered activity trackers to their employees; some did so as part of insurance discount programs [4]. In other countries, such as Denmark, trackers are used in health promotion campaigns and competitions. This proliferation of activity tracking and collection of health information has been a matter of concern for privacy advocates who urge people to "take privacy concerns seriously" [3]. But what exactly are "privacy concerns" when looking specifically at the intro-

duction of wearable health technologies in the workplace? Questions are asked as to who actually owns the data produced when wearing the devices, what it might be used for and what will happen with that data in case data collecting companies (be that Fitbit, Jawbone, etc.) are sold or merged with companies with different privacy standards [4]. These questions become even more important as activity data is correlated with other available data sets and as such data assemblages begin to find their way into courtrooms [6]. Yet 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 [14,18].

In this paper we report on a study of a workplace health promotion campaign that relies on the use of step counting technologies and individual daily reporting of steps over the course of three weeks. We explore the kinds of concerns employees express about disclosure of step counts, and how they change over time. We find that there is little in the way of concern with data disclosure to institutional actors such as the organization behind the health promotion campaign, the workplace itself and the technology companies that provide the devices and applications for counting. Concerns over data disclosure to interpersonal connections such as fellow employees, bosses or friends, however, change over time.

## BACKGROUND

Concerns about health information disclosure have been voiced in many ways. Within HCI, these are concerns about data ownership and use, leading to research focusing on personal privacy [9]. Whereas data security is protected by laws, personal privacy denotes the "more fluid notion of privacy around a person, such as one's right to control personal information flow" [2]. Much HCI research has focused on how users manage information sharing, as this has influence on uptake of current technologies, and the development of future technologies [1,10].

Outside of HCI, privacy advocates argue that there is the possibility that when some people are encouraged to disclose health information, it might force everyone to do so down the line, in which case those refusing to disclose could become stigmatized or even penalized [16]. However, a recent survey conducted by Healthline showed that just 25% out of 3,679 participants were concerned about data collected by health tracking technologies and apps [15].

Perhaps something like steps does not in fact qualify as health data? Researchers have argued that people who share personal information online may fail to understand how it is possible to aggregate information from different online sources, for example identifying high confidence patients [12]. For example, Facebook likes can reveal a person's sexual orientation, ethnicity, religious and political views, amongst other personal attributes regardless of how much the person themselves wants to reveal directly [11]. Steps are an indicator of activity levels, which could potentially be used to infer sensitive information about individual users. In a study of experimental integrated wellness application Cardea, Lingg et al. have shown how data from a wearable device can be synced with data from Human Capital Management databases to compare sleep quality across employees working on different projects. Lingg et al. do admit that "a subset of our users felt that privacy is a significant concern" [13] but do not clarify what these concerns are and how they might be addressed.

In research on tracking technologies, the notion of privacy concern is often used as an umbrella term that conflates worries about data disclosure to institutional actors such as health insurers, employers or tech companies and concerns with the impact of data disclosure on interpersonal relationships [10]. Research on privacy attitudes however tends to focus on either interpersonal or institutional concerns separately [19,20]. Despite a frequent focus on privacy concerns few studies consider how these emerge and are negotiated in practice [2].

## RESEARCH CONTEXT AND METHOD
In spring of 2015 the first author conducted observations at a workplace participating in the bi-annual step-counting campaign "Tæl Skridt" (Count Steps). This campaign targets workplaces with sedentary work practices and is initiated by the Danish Company Sports association. Colleagues sign up in teams with a goal to walk 10,000 steps for at least 11 out of the 21 campaign days, and teams reaching the set goal enter a lottery for a cash prize of 50,000 DKK. There is a small fee for participation and participants are free to choose the device or tracker they want to use. Some companies waive the fee and even provide participants with trackers. Participants in this study used a variety of trackers, including pedometers, and various smartphone apps. Employees use the campaign web site to log their steps and to convert other activities, such as cycling, golfing or swimming, to steps. For a more detailed description of the campaign and our methodology please see [7].

The department under study is part of a 2000 employee-sized company. The department is a communications department in charge of generating text for digital communication with company customers and supporting optimization of digital tools, and had 28 employees (20 females and 8 males) at the time of the study. Employees ranged in age between 20 and 65 with two employees aged over 50 and approximately a third aged 30 or younger. 17 participated in

the campaign (hereafter called "participants"). The first author spent 12 workdays at the workplace in March 2015, and conducted 9 interviews with both participants and non-participants at the end of the study. Field notes and interview transcripts were iteratively coded following [5].

## FINDINGS
The fact that just under two thirds of the department under study participated in the Count Steps campaign gave us an opportunity to study both users and non-users in situ as they negotiated the use of the device and campaign participation in the workplace. Considerations of non-participation have previously been detailed in early studies of active badges in the workplace [8], but are limited in current research on wearable health technologies. In the following we consider the range of concerns people expressed in the course of the step-counting campaign addressing both participants and non-participants and then describe how attitudes towards the campaign changed over time.

Interns and external consultants were not able to join the employee association, which meant they could not sign up for the campaign. Participation required addressing several practical issues such as finding a team, signing up, and selecting a step-counting device if one was not already owned. The hassle of signing up, paired with the expectation that one might not have the time to put in the effort to get to 10.000 steps a day was a hindrance to several employees who were eligible for participation. A few, however, explained other reasons for non-participation.

Over the course of the campaign we observed that some non-participants were unhappy with the time participants spent on campaign participation (checking steps online, walking longer to get coffee, etc.). Kirsten explained that the competition element brought out not-so-nice sides in some of her colleagues: *"So that's where I see a flipside, to some people this is not good. Not to say that you shouldn't do it, but some take it too literally. Use it more as a thing, to down prioritize tasks"* (Kirsten, non-participant, interview). To others the focus of the campaign just did not fit with their idea of health. Kirsten was wary of signing up because her friend had become obsessed with tracking and she feared a slippery slope to a problematic obsession for herself as well. However, very few chose not to participate because they were explicitly unwilling to disclose information they saw as private. At the start of the campaign none of the employees seemed to think that disclosing the number of steps walked per day was anything to be worried about. Frederik, for example, said that steps were *"innocent"*, but also noted that *"it is in some ways a blurring of the line between work and private life"* (non-participant, interview).

Overall, the reasons for choosing not to participate were quite personal. Non-participants considered campaign participation in relation to their own expectations, views of health and time they were willing to put aside for this, and found that these did not align. The concerns thus were pri-

marily about time commitment and none gave much thought to potential disclosure of data and its outcomes.

## Initial reasons for participation
The majority of employees chose to participate in the campaign thus agreeing to reveal personal step-counting data to their coworkers, to the organization behind the campaign and potentially to any other campaign participants across Denmark. To understand why people were not particularly concerned with such broad disclosure of health data we first consider the reasons for participation. As we have previously described [7], employees in Danish workplaces participate in a range of city and countrywide health-promotion campaigns that are designed to encourage cycling to work or promoting sugar-free workplaces. Thus the Count Steps campaign was quite familiar and easily understood, with the use of the tracking device as the only new element.

Tæl Skridt marketed itself as a "*campaign focusing on activity, socializing, and competition in the workday*"[1]. To some participants the stated purpose of activity intersected with their personal goals. To Elizabeth, the social element was of primary importance: "*I'm also quite new in this workplace, and then I thought that was a good opportunity to get more integrated and be a part of the community*" (participant, interview). For Rachel, a long-term employee this was also important: "*I feel like it gives an extra incentive to keep an eye out on whether you walk enough, but if there hadn't been colleagues who said, we want to join, then I wouldn't have joined*" (Participant, interview).

So while participation was helped along when there was a fit between stated campaign goals and personal motivations from prior to the campaign, the social aspect was crucial. This was also linked to the competition element, which was important to many of the participants, turning the campaign into a game. In short, reasons for participation match the rhetoric of the campaign. In addition, the length of just three weeks seemed reasonable at the outset of the campaign, which made participation a temporary commitment and thus less daunting.

The reasons for participation also framed some of the initial ways that campaign participants explained their willingness to disclose step data. The voluntary nature of the campaign and the fact that it focused on steps was considered harmless: "*I mean you walk steps anyway*" as Rachel explained (participant, interview). It was clear that participants did not expect their data to be used in any other setting, or combined with other datasets to infer any information about them. In general, there was a strong feeling of control. For example, Jonas used several apps on his iPhone, for tracking different kinds of sport activities. He explained his relationship to the companies behind his trackers: "*Well, I mean, I have just said no, no, no, to everything, so there's*

nothing, I mean, I think they can see my data… But they are not allowed to use it for anything" (Participant, interview).

Arguably, in the case of the Tæl Skridt campaign, the information is not used for anything other than knowing how many people signed up[2], but that only accounts for the website. Even so, the participants raised no concern of sharing their data with other institutional players such as the companies behind the devices and apps they used. Only in interviews, when participants were directly asked towards the end of the interview, of their opinion of US style health insurance premium discount programs for participation in step counting, a participant said; "*The problem is then if you deselect someone, if you can't get insured if you are too inactive*" (Jakob, participant, interview). Jonas explained in an interview why for him it is not a problem to share health data with the workplace: "*Well there's no challenge, the problem is only if they have information the other way, if you are defective in some way, if you are sick or something. But they would know that anyway*" (Participant, interview). This reveals how this participant clearly expects that the data or information about his steps in this case, but information about him also more broadly, is not used to infer anything about him that he already does not know himself, and that he has not explicitly revealed to his workplace. Despite this certainty in the safety of their data with respect to institutional involvement, the implementation of the trackers in the work life did not go without incident.

## Experiences of use
Wearable health technologies make a particular set of information about past activity, such as the number of steps taken, available in an easily reportable manner. Even though the campaign had similarities to other health initiatives, participants had not previously experienced this sort of specificity in disclosure of information about them to others in the workplace. This, combined with the competitive elements of the campaign, necessitated negotiations of what had to be revealed, and when it was acceptable not to share one's step counts. Participants therefore experienced that the implementation of the tracker demanded a re-negotiation of boundaries of disclosure. We observed how participants collectively negotiated that some events in their private life could excuse them from registering steps while others clearly did not.

> In the office Dorit asks Jonas whether Hans is sick. Jonas replied: "No, Hans just hasn't registered any steps yet". Rachel and Dorit discuss that they haven't walked 10,000 steps all days, and they think they might also have dragged the team average down because of it. (Observations, week 2)

In this case, it was well known in the office that Hans was under a lot of stress at that moment. Dorit realized that ask-

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ing about it might seem insensitive. She then offered her own experience of not having walked that much.

The use of the step counter and the necessity of registering steps daily on the campaign website troubled the tensions between what people felt they were comfortable disclosing and what was perhaps less appropriate in a work context. In principle the campaign demanded that all participants reach the same goal and reveal the same amount of information, yet in practice we observed how employees negotiated when and how one can appropriately demand teammates to "*pull themselves together*", or when one should look the other way. By using the device, participants discovered that disclosing steps was more than merely disclosing a number. Step-counts as indicators of activity level, became objects of scrutiny. Participants would often ask each other how many steps they had walked which led to inquiries of how and why.

> *One morning in the office Rachel and Kathy are discussing their steps as Rachels says: "Kathy walked more than a half-marathon!" Charlotte interrupts: "Now I have to ask, what did you do this weekend?" Rachel explains that she and her boyfriend went hiking in Sweden.* (Observations, week 2)

> *At lunch participants are discussing their weekend activities and how many steps they counted. Vibeke explains that she didn't get many steps on Sunday because she was at her mom's place.* (Observations, week 2)

Here we note that teammates required of each other explanations of very high and low step-counts, such as visiting and elderly mother or going for a long hike. Just as steps could be a sign of very high activity levels, low numbers revealed that perhaps things were not going so well.

Over time we observed that the amount of social pressure became quite significant. As the weeks wore on, the length of the campaign (just three weeks) became increasingly important: *"The last week I was thinking, good this thing ends soon. To me this thing about being bound up to a step counter everyday, I had enough of it"* (Rachel, participant, interview). This attitude was shared across all participants, and in fact when the campaign ended, no one chose to continue counting steps in the same way. We see the on-going management of the social expectations and feelings of step-counting as a burden as practical manifestations of how people address privacy concerns. During the three weeks of the campaign, it became acceptable to question other participants about their private life outside of the workplace, explicitly based on the step-counts they reported. These step-counts, after all had to correspond, at least somewhat, to what they were actually doing, which in turn had an impact on the choices they began to make in their private lives (we observed people discussing their decisions to go for an extra walk or staying on the couch over the weekend). Participants had to negotiate the realities of private life that intervened with their step-counts, such as being sick, with the

pressures of teams and competition through increased disclosure of personal matters. Over time, the teasing and discussions of steps began to subside, disappearing almost entirely together with the wearable step-counters in the days after the campaign. Through the pressures and demands of participation, concerns about what information was revealed changed over time. Initially attitudes toward the campaign and information disclosure were largely framed by the rhetoric of the campaign, but over time these changed to accommodate the lived experience with the technology. Thus from a design point of view, if we are going to worry about privacy, we need to consider what it is that people might be worried about and what might be the sources of comfort or discomfort. Thus design should consider initial concerns as well as concerns that evolve over time when we talk about privacy in the context of the workplace.

## DISCUSSION AND CONCLUSION
Our findings show that there is a difference in concerns relating to disclosure of health data in the workplace between people who do and do not choose to use wearable technologies and participate in health promotion campaigns. Non-participants raised concerns of obsessions with tracking, the amount of time spent on it, and the potential blurring of lines between work and private life, whereas the initial lack of concern of participants was framed by the strong rhetoric of the campaign. Secondly, we are able to show how the concerns of the employees who choose to participate change over time. Initially concerns about step count disclosures were dismissed as harmless. Over time however, participants discovered how revealing these types of disclosures could potentially be and thus they were forced to renegotiate boundaries of disclosure in situ.

A recent report from PricewaterhouseCoopers states that *"for all the concern, consumer appetite for revealing personal information is changing – they are now growing more comfortable with the risks as the rewards become more appealing"* [17]. Our findings caution against such an assertion. As the rewards of using wearable technologies, such as pedometers, become more appealing, consumers are attracted by the *rhetoric* and the imaginaries of their use. The resulting necessary negotiations of boundaries of disclosure, and experienced discomforts, are unexpected because they do not fit with the rhetoric, and must be dealt with alongside the use of the technology. At the point where these concerns surface however, it may be too late to change the conditions of disclosure set up as they are based on the rhetoric of health, wellness and better life. Thus we observe users putting effort into collectively redrawing boundaries of disclosure to accommodate the devices.

## ACKNOWLEDGMENTS

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