View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by The IT University of Copenhagen's Repository

Article

new media & society
1–17
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1461444819851239
journals.sagepub.com/home/nms
SAGE

Episodic use: Practices of care in self-tracking

Nanna Gorm and Irina Shklovski
IT University of Copenhagen, Denmark

Abstract
The development of self-tracking technologies has resulted in a burst of research considering how self-tracking practices manifest themselves in everyday life. Based on a 5-month-long photo elicitation study of Danish self-trackers, we argue that no matter how committed people might be to tracking their activities, their use of self-tracking technologies can be best described as episodic rather than continuous. Using Annemarie Mol's theoretical framework for understanding care practices as a lens, we show how episodic use can be interpreted through the logic of care. By using self-tracking devices episodically, users employ strategies of care in a way that can be productive and useful. These strategies often come in conflict with the logics of choice that underlie the design of many self-tracking technologies. We argue that this has consequences for the way self-tracking devices need to be imagined, designed, and introduced as part of workplace and insurance-type tracking programs.

Keywords
Digital technologies, human-technology interactions, logic of care, photo elicitation method, self-tracking, self-tracking in everyday life

Introduction

Activity trackers allow for detailed self-tracking, defined by Lupton (2016) as practices that are "directed at regularly monitoring and recording, and often measuring, elements of an individual's behavior or bodily functions." People use a variety of techniques and new technologies—from dedicated devices such as the FitBit to applications on their smartphones for self-tracking. They do so to track every manner of activities: from steps

Corresponding author:
Nanna Gorm, IT University of Copenhagen, Rued Langgardsvej 7, 2300 Copenhagen, Denmark.
Email: nanj@itu.dk

to sleep and even to consumed calories. The increase in activity-tracking devices is driven by hopes for its potential to improve levels of physical activity (Ledger and McCaffrey, 2014). Often, the basic assumption is that activity tracking can inform individuals about health behaviors and that, ideally, this information will motivate them toward healthier habits. Even though this sort of responsibilization of health has been critiqued extensively (Lupton, 2016; Moore and Piwek, 2017), the rhetoric in some areas of scholarship and marketing discourse remains positive (Schüll, 2016). So much so, in fact, that activity-tracking devices are increasingly introduced in workplaces as part of health and wellness programs and insurance incentive schemes (Chung et al., 2017; Gorm and Shklovski, 2016).

Despite the rapid expansion of activity-tracking technologies, little attention has been paid to the fact that users often leave devices behind sooner than expected. Industry research shows that half of U.S. users leave their devices behind within 6 months (Ledger and McCaffrey, 2014). Such abandonment is often framed as failure and seen as an opportunity to develop and improve technologies, thereby "fixing" the problem (Gorm et al., 2018). While existing research on how and why people stop using their tracking devices has emphasized that this is not just a technological issue (Clawson et al., 2015; Epstein et al., 2015; Kristensen and Ruckenstein, 2018; Nafus and Sherman, 2014), the idea that technical fixes are needed persists. However, whether continuous or even long-term use should count as a success is debatable. For example, Gorm and Shklovski (2016) have previously argued that even short-term engagements with activity tracking can constitute success when considered as part of a broader set of health practices.

In this article, we propose to interpret this lapsing or stopping of use as a form of *episodic use*. We argue that episodic use is an integral part of ongoing self-tracking practices rather than a problematic hitch or an ending. By looking at the practices and concerns surrounding self-tracking technologies, combining prolonged empirical studies with key theoretical concerns from Annemarie Mol's work on care, this article empirically investigates self-tracking practices over time. Foregrounding the idea of episodic use as a practice of care not only challenges the focus on lapsing as a technologically fixable problem but also enriches existing theoretical discussions by nuancing and expanding our existing conceptual vocabularies, honing in on the complex ways in which practices of care and tracking are negotiated (Epstein et al., 2015; Lomborg et al., 2018).

Activity tracking from the perspective of logic of choice and logic of care

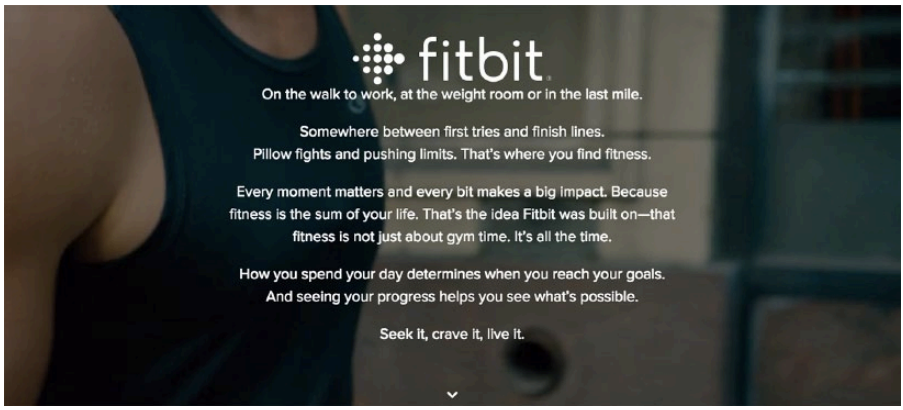
Prior research has convincingly demonstrated that despite powerful metaphors of the quantified self-type user, everyday self-tracking practices are different and much less studied (Didžiokaitė et al., 2017). This is important because imaginations of what self-tracking means shape future technologies and their implementation. The expectation that activity-tracking devices ought to be used continuously and consistently largely informs not only the design and development of these devices and the software that supports them but also the increasingly common attempts to integrate self-tracking into institutional arrangements of workplaces, medical systems, and government policy.

We argue that episodic use is a useful concept for a different imagination of self-tracking technologies. To challenge underlying assumptions and to build new imaginaries, we draw on the work of Mol (2008), who refers to such assumptions as logics. Mol works with two main logics, namely "logic of choice" and "logic of care" (p. 8). In this article, we take up her invitation to translate and apply these concepts to new domains.

In developing her framework, Mol focused on data tracking among chronically ill diabetes patients. She showed how devices developed to measure blood sugar levels were marketed following what she named a "logic of choice." Diabetes professionals, such as doctors and nurses supporting patients, meanwhile, adhered to a "logic of care." The logics of choice and care thus underpinned the rhetoric and practice of diabetes management. As Mol explains, "The logic of choice assumes that we are autonomous individuals. The logic of care is attuned to people who are first and foremost related." (Mol, 2008: 62). Diabetes, of course, "is a matter of daily survival, one that is pressing and often grim" (Kaziunas et al., 2018: 4). The same cannot be said for the much more mundane experience of everyday tracking, among Danes who self-track on their own initiative or by being "pushed" by family members (Lupton, 2014).

While there are differences between the chronically ill patients with diabetes and the often healthy, perhaps even fitness-minded participants in our study, we see the same underlying logics at play. When people are cast as rational individuals, providing them information about the harms of a certain type of behavior is often thought to be enough to elicit change. Mol sees this manner of dispensing information about health as driven by the logic of choice. This logic also underpins the idea of "patient choice," originally put in place to support patients in dealing with supposedly paternalistic doctors. Ideally, such choice should create a more equal relationship between doctors and patients. Yet, when things go wrong, blame often falls on the shoulders of patients because bodies and technologies are "unruly" (Mol, 2008). This makes individuals responsible for their own health despite the fact that health is greatly impacted by structures beyond individual control (Stokols, 1996). People do not make purely rational choices in a vacuum, and patients do not act entirely on their own but have family and friends who influence their choices (Mol, 2008). The same is true for users of activity-tracking devices, whose habits and everyday lives are impacted by and also impact others. In her studies of a consumer electronic development, Schüll (2016) demonstrated that there are strong assumptions among digital technology companies about how the use of digital devices might support the making of healthier choices. Yet the messiness of life and the fact that health is impacted by a great number of factors beyond individual control is left out of the development and implementation process (Schüll, 2016).

Much like the diabetes measurement technologies studied by Mol, self-tracking devices are marketed following the logic of choice. Advertisements for self-tracking technologies are full of healthy and happy bodies that, with the help of the self-tracking devices, are making the right choices to stay fit. On their website, Fitbit states "fitness is not just about gym time. It's all the time" (see photo below). To stay fit, which is something to strive for and equated with staying healthy, one should be active, and every move counts. Following this logic, one should ideally be active as much as possible. Activity-tracking advertisements, such as the one here, do not mention the everyday struggles and realities of trying to be more active.



Screenshot from Fitbit website (www.fitbit.com/dk/whyfitbit, 12 September 2018).

Taking structural and social circumstances into consideration, rather than seeing people as autonomous individuals, is part of what drives the logic of care (Mol, 2008). The logic of care is a fundamentally relational construct that goes beyond seeing improvements of health as the result of well-considered, individual choices. Rather, good care recognizes the complexities of life, trying to strive for improvement but knowing that the process is not linear. This is not an excuse to give up when challenges arise, but a forgiving and persistent view on improving health. The logics of choice and care are not mutually exclusive but simultaneously occur and interweave (Mol, 2008). In this article, we show how the logic of choice drives the marketing rhetoric of activity-tracking devices. Yet when activity tracking is taken up in everyday life, our participants used technologies in ways that underpinned practices of care.

Developing alternative frameworks for understanding how people use self-tracking devices is important, not least because the idea of sustained use is moving into new settings, such as workplace health insurance schemes and health promotion initiatives (Christophersen et al., 2015; Moore and Robinson, 2016). This development signals a move from "private" self-tracking to "pushed" self-tracking, where the encouragement to initiate tracking is put forward as part of institutional arrangements (Lupton, 2014). For example, employees in some companies in the United States earn points for gift shops or receive lower insurance premiums through the use of self-trackers (Christophersen et al., 2015; Chung et al., 2017; Nissenbaum and Patterson, 2016). What this means is that, in some cases, even if individuals may want to stop using their devices, it could have economic consequences. The fact that activity-tracking devices, and the positive rhetoric surrounding them, are moving into areas beyond personal choice merits a closer look at what it actually means for people to track and to stop tracking their activities.

The importance of non-use in self-tracking

An increasing number of studies have considered the implications of activity-tracking practices. In some areas of research, such as marketing or technology development,

studies have adopted a positive rhetoric toward self-tracking. Here, abandonment of tracking technologies is often discussed by industry (Ledger and McCaffrey, 2014) as well as academic research as first and foremost a technological problem that could and should be fixed (Gorm et al., 2018; Wilde et al., 2015). Improving esthetics (Shih et al., 2015), creating interesting visualizations (Consolvo et al., 2008), building variation in goal-setting (Munson and Consolvo, 2012), and offering opportunities for reflection rather than prescriptive information (Baumer et al., 2012) are but some of the suggested solutions to the problem of abandonment. Much of this research sees people stopping their tracking as a failure either of internal motivation or of the design of the devices. Often, this is based on the idea that health benefits can be gained from continuous use (Wilde et al., 2015). Improving devices and fixing bugs so that users have better experiences with them is a laudable goal. However, we suggest that only attending to technological solutions to abandonment overlooks other reasons for leaving trackers behind. In fact, we argue that idiosyncratic user patterns are a way for users to stay in control of the activity-tracking devices.

At the same time, some researchers have expressed growing concerns about the potential negative implications of self-tracking technologies. They point out the fact that health data is bought and sold and can be used in unforeseen ways (Neff and Nafus, 2016). The data producers (self-trackers) rarely have full knowledge or access to their own data and, as researchers point out, we do not yet understand the ways in which self-tracked data may disrupt existing information flows (Nissenbaum and Patterson, 2016). Researchers in this space have argued for a "a refusal to track the body, a refusal to subordinate the qualitative to the quantitative" (Moore and Robinson, 2016). While there are important, and grave, consequences of the increasing datafication of health, such critique rarely shows the way forward (Mol, 2008).

Attending to the overarching societal implications can overlook the lived experiences of tracking, which can be fun and personally meaningful (Neff and Nafus, 2016). Self-tracking intertwines with everyday life in a variety of ways (Rooksby et al., 2014) and can be experienced as amplifying some parts of the self while reducing and restricting others (Kristensen and Ruckenstein, 2018). Recent work by Lomborg et al. (2018) show that users are "hooked" in a different way than those inscribed in the technology, yet the pleasure of building personal repositories is something some users find important (whether tracking runs or types of wine tasted). These studies draw attention to the consequences of tracking at a more detailed level. For example, Lupton (2017) argues of the importance of considering the affective atmosphere in using digital health technologies while realizing that these are difficult for participants to fully articulate. Pink and Fors find that using self-tracking technologies "creates new relationships with and ways of feeling situated" (Pink and Fors, 2017), which we recognize from our own study. However, self-trackers react differently to "good" and "bad" numbers, yet little research has considered what self-trackers do to deal with these outcomes. We argue that the practice we propose to label as episodic use is a pivotal part of dealing with these affective outcomes. Data from activity trackers can never be complete, although devices are marketed as creating clear and actionable numbers that will support the user toward a healthier life. Instead, we see that "ongoing and not predetermined processes of human creativity underpin improvisatory ways that people engage with data" (Pink et al., 2018).

This creativity and improvisatory work with data, however, is tiring, and in the case of self-tracking, a way to manage this, we suggest, is by engaging in episodic use.

Tracking activity is not a straightforward process of working toward standard health goals. Some existing models, such as the lived informatics model, take non-linear perspectives on tracking and lapsing of use (Epstein et al., 2015). This model suggests that there are four different types of lapsing: forgetting, upkeep, skipping, and suspending. Users might forget to wear their devices, and devices also demand upkeep, such as charging in order to work. Users may skip some occurrences in their tracking practices if it is too cumbersome, while suspending tracking can happen because the user decides tracking is no longer needed or wanted. These categories of lapsing, however, are used as a springboard for considering how to support users in avoiding lapsing by improving technologies. We offer a reconceptualization of what it means to leave the trackers behind by using Mol's framework of logics of care and choice to explore how self-tracking technologies are used in practice. The notion of episodic use offers a different interpretation of lapsing, going beyond seeing abandonment as a technologically fixable problem. Rather, what we call episodic use is integral to using activity tracking in ways that support practices of care.

Research design and empirical data

Self-tracking and interaction with wearable devices tend to happen idiosyncratically, often alongside other activities. This makes observational studies difficult, which is the reason that most studies have relied on surveys or interviews (Epstein et al., 2015, 2016; Fritz et al., 2014; Rooksby et al., 2014). Below we present a brief description of the methodology we developed to move beyond these limitations. For a detailed discussion, please see Gorm and Shklovski (2017).

Study set-up

In this study we bring perspectives from Denmark, where statistics show that 30% of all households have at least one activity-tracking device (Danmarks Statistik, 2018). Denmark is similar to many other developed countries where activity trackers are increasing in popularity. By engaging with participants in Denmark, we bring empirical findings forward that can contribute to a better understanding of how activity trackers are implemented in everyday life more broadly.

We recruited 25 participants from Denmark through several Facebook groups (Ladies First, women in start-ups), FitBit Denmark and Fitness.dk (a fitness chain), and snowball sampling. Denmark has a high percentage of Facebook users, with 67% of the population using Facebook (Wijas-Jensen, 2014); thus, Facebook groups gave us access to a variety of users, who, we assumed, would be interested in technologies and fitness.

We selected a varied group of participants from a pool of 64 initial responses by conducting phone screenings to ensure varying degrees of previous experience, age, and occupation. The study included a total of 25 participants: 15 women and 10 men, aged between 21 and 57 years, with an average age of 36 years. Participants covered a variety of occupations, including two students, a music teacher, a carpenter, a nurse, a nursing

home employee, a writer, a human resource employee, an information technology (IT) consultant, and others. Apart from the nursing home employee and the carpenter, participants had mostly sedentary occupations. To ensure that we could recruit new users, we offered Fitbit devices for the duration of the study. A Fitbit, similar to other tracking technologies, has a range of sensors, the most basic of which is an accelerometer. These sensors detect movement, then runs this data through an algorithm that takes into account the height, weight, and other attributes of the user, displaying the results back to the user via a screen on the device or a smartphone app.

Among our participants, nine did not own a tracking device and were offered a choice between Fitbit One (clip-on device) and Fitbit Flex (bracelet). Fitbit has Facebook groups in Danish, where participants could potentially seek help. The devices we offered, along with most of the devices owned by other participants in the study, were relatively simple and counted steps, distance, and pace. Most also offered sleep tracking, GPS tracking, and measured pulse. A few participants had advanced trackers that could also track swimming or other sport activities as well as suggest training intensity and recovery time. As such, our participants made up a group of both experienced and inexperienced as well as advanced and more basic tracking users. We included participants from several different parts of Denmark, covering the two biggest cities of Copenhagen and Aarhus as well as several small towns and countryside areas. For more details on recruiting, participants, and methods of this study, please refer to Gorm and Shklovski (2017). Participants who received trackers told us that they were motivated to participate to "try out new cool gadgets." Other participants were interested to reflect on their own tracking practices, and a few stated they believed it is important to support research.

Initial interviews were conducted in August 2015, followed by the photo-elicitation component, including intermittent engagement via email for several months, and a final interview. For the photo-elicitation, all participants were asked to take photos of their experiences with activity-tracking devices over the course of 5 months. We encouraged them to capture any experience, thought, or subject that they felt was important in relation to their activity-tracking practices. Photos were sent to us via email, and we encouraged them to add a short written description of each photo. If we did not receive photos for 2 weeks, we sent personalized reminders, sometimes asking to follow up on something they had mentioned in their previous email. Two participants, who had received Fitbits, lost their trackers by accident within a few weeks of the start of the study. We followed up with both participants as they left the study, but one was omitted as he had used the device only briefly before losing it. Two participants did not respond to our invitation for follow-up interviews.

We received 313 photos in total over the course of the study, ranging from 4 to 125 photos per participant, with a median of 8 photos. We believe that such a large variation in the number of photos stemmed from differences in how the task was interpreted by the participants. Some only took photos when they were sure it conveyed an experience they really wanted to discuss, while others used a "catch all" approach. No matter the number of photos, these played an important role in investigating the full context of the use of tracking devices and the affective responses to self-tracking (Lupton, 2017). At the follow-up interviews, we printed all photos from each

participant and asked them to go through the photos and explain each image and why they had taken it. To facilitate further reflection, participants were then asked to look through their photos and discuss whether they fit together in categories. The researcher made sure to follow up on any subjects or questions that had arisen in the previous months. We conducted 21 interviews in Danish and 1 in English. All interviews were recorded and transcribed. We followed a grounded theory approach when coding the interviews, using the TAMSanalyzer tool (Weinstein, n.d.). The findings presented in this article are based on photos, emails, researcher notes, and interviews with the 22 participants who completed a follow-up interview between December 2015 and January 2016. We refer to participants "P" by a number and M (= Male) or F (= Female) for anonymization.

Conceptualizing episodic use

Self-tracking can be both motivating and fun as many of our participants frequently attested. For example, P21F explained that she found meeting her goals really pleasant, and it gave her the confidence and energy to try to reach more steps on other days too. P25F liked receiving badges from her Fitbit when she reached a certain number of steps, and she also enjoyed the visualizations of her heart rate during workouts. Such stories are common and have been discussed in much scholarship on self-tracking (Neff and Nafus, 2016).

Yet there were many times in which the experience of self-tracking was more of a letdown for our participants. Consider the following observation from P19F, who was enthusiastically counting her steps because she wanted to increase her fitness levels. Although high goals motivated her, it backfired when she did not meet them, and she felt disappointed with herself.

"Okay, so in this (photo), I was thinking that it's late and I've only walked 4300 steps, and it's 10 pm so I will not walk more steps and it's not even close to my goal. My goal is 12000 a day, so 4300 is incredibly few. I think it's the first time I've been so far from my goal, except if I didn't wear it at all. So this shows the thing about 10 pm and I just realized that I haven't reached those steps and it really sucks" (P19F, follow-up interview).

Perhaps this feeling of disappointment is necessary, especially if people are ostensibly trying to be healthier and walk more. Disappointments may lead to better performance later. Yet in the follow-up interview, P19F explained how hard she worked to not let the feeling of disappointment at missing her own goals take up too much emotional space:

> Yes, well I actually find it incredibly difficult, also because I've been stressed before, so I know I can't let this thing control too much, and I have to feel whether I do this because I have to or because I want to. So I'm very aware that I shouldn't stress too much about walking those steps. (P19F, follow-up interview)

P19F's concerns about letting the tracker "control too much" is interesting especially because she points to this concern as a potential source of stress. The same was true for P25F who described being "disappointed" when she did not reach her daily step goal. This disappointment, however, did not lead to her trying to walk more. Instead, she told us that she realized she had to take a step back from her goals and to forgive herself when it was difficult to reach them when other things in life, like work and travel, demanded her time. P22F explained how frustrated she had been with her low levels of physical activity in the past few months. Her low numbers of steps were due to a temporary work situation, which demanded entirely sedentary work, and due to the long dark Danish winter, she explained. In these conditions, self-tracking to her was "permanently a bad conscience" (P22F, follow-up interview). We argue that these responses or feelings of guilt and letdown occurred due to the fact that tracking technologies are built around the assumption of continuous use, which fits poorly with the complexities in life—something that Mol (2008) would term the logic of choice.

Logic of choice

When taking a closer look at activity trackers and the way they are marketed, it becomes clear that they are designed around the assumption that continuous tracking is how the user needs to use the device to benefit from it. Examples of these assumptions are clear in industry reports that equate success with long-term engagement: "The success of a wearable depends on its adoption by the market and how well it inspires long-term engagement" (Ledger and McCaffrey, 2014). The strings of reminders, vibrations, and visualizations are all oriented around daily goal completion, weekly overviews of daily activity, and so on. Lazy days are often starkly marked out, and the averages are of course nonsensical if the lazy days are counted in. As Mol (2008) would put it, current self-tracking devices are designed with the logic of choice built in. People must choose to become more active, but when such a choice is made through the purchase of the self-tracking device, the device anoints its user with the responsibility of living up to a particular notion of more active and healthier lifestyle built into the device. The perfect user is imagined as one that wears the device continuously, achieves daily goals, and manages to charge the device while conveniently stationary in between bouts of active effort. Episodic use, by this line of thought, is something to be eradicated.

Typically, participants in our study had obtained a tracking device or were curious to try it out because they decided that they wanted to do something about their activity level. Some had received trackers as gifts or were just generally gadget happy and

curious to see what the fuss was all about. No matter the initial reason for tracking, participants soon had to come to terms with the numbers on the screen. When the trackers showed how many steps have been walked, participants in our study would often compare this to the preset goal (almost always 10,000 steps). Most of our participants struggled to reach this goal but were adamant to stay positive. However, staying positive when day after day the goals were not met—and there was little to be done about it because of busy workdays—was a challenge.

Episodic use as logic of care

As a consequence of feeling guilty when looking at her screen, P12F explained how she had decided to "use the tracker the other way around." She chose deliberately to only look at the good days where she did have a chance to walk. In fact, by the end of the study, she only wore the device when she knew she was going for a run or a long walk. P12F had found a use pattern that worked for her:

> I think that when I go travel or something where you walk a lot, I think I'll wear it all of the time, because it's fun to see how much you walk, but when I'm at work and I walk 2000 then I don't want to wear it, it doesn't make a difference if I wear it or not. (P12F, follow-up interview)

In the quote above "it doesn't make a difference if I wear it or not" is a statement that was echoed by many. No matter the personal goals, P12F had many obligations that needed to be fulfilled and often these came in conflict, arranging her days in ways that did not allow a lot of walking. The self-tracking device could only reinforce what she already knew was the case; it could not change the situation.

P20F had a lot of motivation to improve her activity levels, but at work, the tracker only served as a constant reminder of how little she walked. P20F did not dwell on her not-so-active days:

> I use the positive in this and say: I've actually been doing something, and maybe I haven't been as active as I would want, but I did do something. Because that's actually my philosophy that you have to look on the positive side when you have something like this [a tracker], 'cause if you start looking at the negative aspects then you'll quickly turn it into something negative. (P20F, follow-up interview)

Similar to Lomborg et al. (2018), our participants often had ambiguous relationships with their devices and data, sometimes re-interpreting the step numbers in unexpected ways that would lead to more positive feedback, allowing them to stay in control. No matter their aspirations, they needed to devise new ways of encountering the data to feel good about the trackers. For example, P22F at times felt that tracking steps annoyed her and took up too much energy. She then discovered that playing the piano would make her wrist-worn tracker count steps and was quite happy about it:

Interviewer: But that's not physical activity?
P22F: No, but then you get to 10,000 [steps].

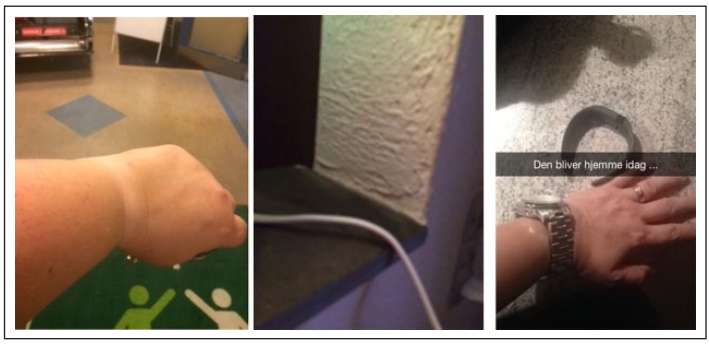
Interviewer: You could just sit and shake it?
P22F: No. That would be sad.

She fully acknowledged that the final step count was misleading if it were to be interpreted only from the point of view of walking, but it meant much more to her. Since she wanted to play piano more and walk more steps, she had no problems with this. We find that the decision to not use tracking devices for a while, or to use it in ways that result in faulty data of steps from playing the piano, is more complex than merely the problems described in prior research as forms of lapsing (Epstein et al., 2015). Most of our participants did not engage in the sort of data manipulation described by Lomborg et al. (2018). Rather, they engaged in what we have termed "episodic use." The effort here is oriented to trying to stay positive toward the numbers that appear on the screen. Choosing to wear the device only when one knows that there will be a "good" or "interesting" number—supporting the feeling of "doing something about physical activity"—is one form of episodic use. This, as Mol points out, is a way to be kind to oneself. Instead of feeling guilty about not living up to the demands set by the device, our participants worked to acknowledge the falling short, moving on, and trying again. The approach here is similar to that of Mol's diabetes patients: caring for oneself is a process. There are bound to be bumps along the way. But rather than diving into feelings of shame for not living up to expectations or blaming oneself for weakness, one must try, adjust expectations and processes if unsuccessful, and then try again (Mol, 2008: 20).

Mol's framework was developed looking specifically at diabetes patients, and thus there are differences as we translate the framework to the self-tracking context. A main difference is in the fact that Mol's diabetes patients were in contact with doctors and diabetes nurses. These healthcare professionals support diabetes patients following a logic of care. While the logic of choice points to continuous use as a gold standard, logic of care is different. With logic of care, the health professionals realize that not everyone can do the diabetes measurements all of the time and keep blood sugar levels low at all times. A caring health professional will translate generalities into what is suitable for the specific patient (Mol, 2008: 67). In the case of self-tracking, there are no caring professionals, so our participants would turn to friends or online forums and then decide how to move forward. P11F told us she had been struggling with motivation to move during winter, but then her family started a small internal walking competition over Christmas. Even with these more personalized goals, however, participants struggled to keep them and deviated from their plans.

Episodic use allows different forms of control

Situations of non-use of self-tracking devices have been documented by a number of scholars. For example, Epstein et al. (2015) created a tracking taxonomy focusing on four types of lapsing: forgetting, upkeep, skipping, and suspending. We also found these four types of lapsing in stories of batteries needing charging, broken armbands, lost devices, and skipping of use because the device did not fit with a certain outfit or because detailed logging was too cumbersome (see photos below).



Photos (from left): Forgetting to wear, photo where the charger used to be (causing lapsing due to challenges with upkeep), and skipping use when the tracker did not go with the outfit.

During our 5-month-long study, participants would often leave trackers for periods of time, usually for specific reasons. P20F and P11F both explained how it was important to have "lazy days," where they would either not wear the tracker or not look at the numbers at all. Some participants even mentioned that reaching their goals every single day might be harmful for them. To P20F, it was extremely important to have "lazy days." She had tried a range of diets and would inevitably lose her motivation if she did not relax sometimes, she explained. In the same way, P11F said that "I have special weekend rules, but I think Sunday is sort of sacred, it's okay to lie on the couch and watch movies all day" (follow-up interview). To do this, she would mute the reminders her tracker usually gave her every hour to remind her to stand up. She explained that this was a difficult battle with her competitive nature. For example, even though she had surpassed her step goals for a week, the fact that there was a zero after a Sunday on the couch bothered her. Yet Sunday on the couch gave her a feeling of a better balance between focusing on activity while also giving her body time to rest.

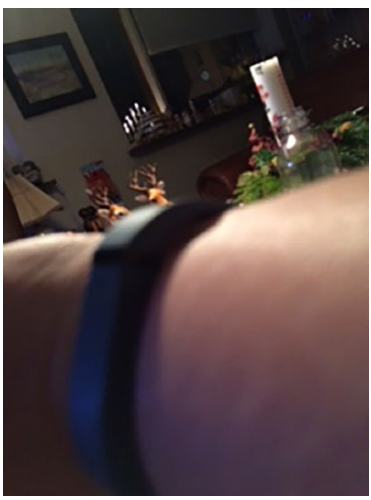


Photo showing tracker with no steps taken and the view from her couch. "Actually no steps today. Hard weekend with work = relaxing on the couch today" (email description, P20F).

Lazy days and other such efforts are a form of skipping or suspending (Epstein et al., 2015), episodes where people may not need or want to track certain things or times of the day. The feelings participants described when explaining special weekend rules or leaving the tracker to stay in control were forceful and clearly very important to them. There was more at play than simply skipping or suspending tracking for a period. Leaving the tracker on, and considering each and every number on the screen, left some participants feeling powerless. Failing may or may not have been theirs alone, but they were always left to contend with the structural constraints of their lives leading them to make trade-offs to manage competing obligations. Lazy days were a way to manage the tensions that arose from tracking and reaching specific goals. If the self-tracking devices were to be domesticated, they needed to accommodate the pleasure of staying on the couch as well.

In paying attention to the various ways in which our participants did not use their devices, we noted interesting patterns, suggesting that some forms of lapsing are quite purposeful and may even be necessary for self-tracking to be possible at all. For example, P22F had not only days of forgetting to wear the tracker but also days when she decided not to wear it. It was not planned, she explained, but something emotional and impulsive. She said,

> I've been aware that it should not control my life, it should be part of my life. It depends on how you use it. It's not a thing that has been controlling me, it's something I've used to check how I've moved. (P22F, follow-up interview)

This particular participant was also going through exhausting medical procedures at the time of our study. Using the tracker motivated her to be more active. However, she knew she might not be able to live up to her activity goals—not because she was lazy but because she had real physical limitations to deal with. Still, she emphasized, that she did not want to just abandon the tracker. Rather, she used it episodically, allowing herself a way to control her use of the device. Nafus and Sherman (2014) argue that although people would often shift what they tracked, resulting in incomplete data records in a traditional sense, this personally meaningful use of tracking practices could be seen as a form of soft resistance. Yet it is hard to see P11F's decisions as forms of resistance in as much as these are merely examples of how self-tracking technologies become what P22F called a "part of life" rather than "controlling life." Episodic activity tracking in this way is just one of the many little tools to help manage the big and small changes in life.

Changing behaviors, such as engaging in more physical activity, is difficult. Predictably, wearing a tracker made obvious to our participants that they were not as active as they wanted to be. This, in part, is the very point of self-tracking devices: to make people aware of their situation and to provide them with the impetus for change. The trackers are designed to remind, to push, and to constantly update, and some of our participants responded by working hard to not be stressed by this onslaught and to forgive themselves when they did not reach their goals. Many had to acknowledge that other things in life took priority and the devices took no notice, making people feel increasingly guilty. This guilt and bad conscience could eventually lead to people no longer using their devices, either for shorter periods of time or for good.

Looking across our data, we find that we could categorize our participants according to Rooksby's taxonomy of tracking, and we could find moments of flow and "hookedness," as suggested by Lomborg. The model created by Epstein et al., with its attention to lapsing, goes a long way toward portraying a suitable model for the types of use we observed among our participants. All of these theories could be utilized to allow for better device design and user experiences. However, lapsing, and, categorization of uses and flow does not cover the full range of non-use of self-tracking devices. Staying in control of self-tracking can be achieved beyond manipulating data (Lomborg et al., 2018), that is, by using devices episodically. Participants who found a balanced and episodic approach to their devices were often the happiest with it. Where expectations of continuous use are shaped by a logic of choice, episodic use can be productively interpreted as a form of attention to personal health through the logic of care (Mol, 2008). In this way, participants were able to learn from their devices and to be motivated when it fit with other priorities in their lives. Whereas lapsing can happen due to technological glitches, and therefore fixed, episodic use cannot and should not be fixed.

Concluding remarks: episodic use as a feature not a bug

The use of activity-tracking technologies can help people learn something about themselves and their physical activity levels. Yet, tracking can at times be both challenging and tedious, and people often negotiate feelings of disappointment and guilt when dealing with the constant and unforgiving reminders and nudges of their trackers. Health-tracking technologies tend to gloss over social determinants of health, and when individuals do not reach their health goals, they are personally held accountable. This glossing over may in fact strengthen social inequalities, as those who are already well have fewer barriers to cross and may find it easier to incorporate tracking (Lupton, 2013; Maturo et al., 2016). The use of digital health technologies, such as activity trackers, results in affective changes (Lupton, 2017). Yet, no matter the cause of the challenges, this research aligns with others that have called for a deeper understanding of how people use these technologies in everyday life (Lupton, 2013).

In response to this gap, this article demonstrates how people engage in substantial amounts of work to use their devices in ways that truly help them care for themselves. Often, this use was episodic in nature, as priorities in life change over time. Putting forward the notion of episodic use has two main implications. First, identifying and taking episodic use seriously challenges the all too pervasive assumption that abandonment is mainly a technological problem. Rather, leaving activity-tracking devices behind for a while is a way for users to deal with complex social situations and life changes. While most research dealing with design and improvement of devices works toward making users track more, we suggest for future research to consider how little is actually needed for users to benefit from their tracking devices. This is no easy task and goes against the data-driven business models of the companies developing tracking devices. Yet, questioning the logic of choice that underpins much of the development is pivotal to develop truly caring technologies.

Second, episodic use is crucial to consider when activity-tracking technologies are introduced as part of institutional arrangements, such as in health and wellness programs at workplaces. Often, continuous use is seen as a marker of success for the tracker and the health and wellness program. However, we can imagine other markers of success.

For example, did the user learn what they wanted to learn? Did they enjoy using the device? Has the tracking helped them care for themselves, whatever care means to them at that point in time? Note how these questions do not require the user to continuously self-track to answer them. Re-interpreting the notion of success in workplace step-counting campaigns is an important part of generating awareness of health, not just pushing continuous use of trackers forward (Gorm and Shklovski, 2016). Introducing activity tracking in ways that allow employees to stay in control and in self-caring ways entail deep considerations of how to allow participants the space to focus on activity and tracking when they want to, realizing that this process will not be continuous and linear. Clearly, more research is needed on what such implementations might look like.

Finally, activity-tracking technologies are easily criticized for running the errand of an extended form of a control society. This makes it seem as if activity-tracking technologies are inherently indifferent to care or cannot meaningfully be incorporated in practices of care. They may seem "other" to care (Mol, 2008). Yet our participants include self-tracking technologies as one element in a process of care by using them episodically. Tracking technologies are not, in and of themselves, "other" to care. It is the expectations of continuous and linear tracking, often built into these devices, which are "other" to care. The difference here is easily overlooked yet truly important. Only by considering how people flourish can we hope to build technologies that in the right ways support—and get out of the way of—life.

Acknowledgements

We thank our participants for sharing their experiences with us and the two anonymous reviewers for constructive feedback and comments. We would also like to thank the IT University of Copenhagen for supporting the study.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Nanna Gorm https://orcid.org/0000-0002-6440-9193

References

Baumer E, Katz S, Freeman J, et al. (2012) Prescriptive persuasion and open-ended social awareness: expanding the design space of mobile health. In: *CSCW '12*, Seattle, WA, 11–15 February, pp. 475–484. New York: ACM.

Christophersen M, Langhoff T and Bjørn P (2015) Unforeseen challenges: adopting wearable health data tracking devices to reduce health insurance costs in organizations. In: Antona M and Stephanidis C (eds) *Universal Access in Human-Computer Interaction. Access to Learning, Health and Well-Being. UAHCI 2015. Lecture Notes in Computer Science*, vol. 9177. Springer, Cham, pp. 1–12.

Chung C, Gorm N, Shklovski I, et al. (2017) Finding the right fit: understanding health tracking in workplace wellness programs. In: *CHI2017*, Denver, CO, 6–11 May.

Clawson J, Pater JA, Miller AD, et al. (2015) No longer wearing: investigating the abandonment of personal health-tracking technologies on craigslist. In: *Ubicomp '15*, Osaka, Japan, 7–11 September.

Consolvo S, Klasnja P, McDonald DW, et al. (2008) Flowers or a robot army? Encouraging awareness & activity with personal, mobile displays. In: *UbiComp '08*, Seoul, Korea, 21–24 September.

Danmarks Statistik (2018) Familiernes besiddelse af elektronik i hjemmet efter forbrugsart. Available at: https://www.dst.dk/da/Statistik/emner/priser-og-forbrug/forbrug/elektronik-i-hjemmet

Didžiokaitė G, Saukko P and Greiffenhagen C (2017) The mundane experience of everyday calorie trackers: beyond the metaphor of quantified self. *New Media & Society* 20: 1470–1487.

Epstein DA, Caraway M, Johnston C, et al. (2016) Beyond abandonment to next steps: understanding and designing for life after personal informatics tool use. In: *CHI'16*, San Jose, CA, 7–12 May.

Epstein DA, Ping A, Fogarty J, et al. (2015) A lived informatics model of personal informatics. In: *UbiComp '15*, Osaka, Japan, 7–11 September.

Fritz T, Huang E, Murphy G, et al. (2014) Persuasive technology in the real world: a study of long-term use of activity sensing devices for fitness. In: *CHI '14*, Toronto, ON, Canada, 26 April–1 May.

Gorm N and Shklovski I (2016) Steps, choices, and moral accounting: observations from a step-counting campaign in the workplace. In: *CSCW '16*, San Francisco, CA, 27 February–2 March.

Gorm N and Shklovski I (2017) Participant driven photo elicitation for understanding episodic activity tracking: benefits and limitations. In: *CSCW2017*, Portland, OR, 25 February–1 March.

Gorm N, Chung C, Shklovski I, et al. (2018) *10 years of Qualitative Self-Tracking Studies: A Literature Review*. Unpublished Manuscript.

Kaziunas E, Lindtner S, Ackerman MS, et al. (2018) Lived data: tinkering with bodies, code, and care work. *Human-Computer Interaction* 33: 49–92.

Kristensen DB and Ruckenstein M (2018) Co-evolving with self-tracking technologies. *New Media & Society* 20: 3624–3640.

Ledger D and McCaffrey D (2014) *Inside wearables: how the science of human behavior change offers the secret to long-term engagement*. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=96736583&site=ehost-live&scope=site

Lomborg S, Thylstrup NB and Schwartz J (2018) The temporal flows of self-tracking: checking in, moving on, staying hooked. *New Media & Society* 20: 4590–4607.

Lupton D (2013) Quantifying the body: monitoring and measuring health in the age of mHealth technologies. *Critical Public Health* 23(4): 393–403.

Lupton D (2014) Self-tracking modes: reflexive self-monitoring and data practices. Workshop paper, ANU, Canberra, ACT, Australia, August, pp. 1–19.

Lupton D (2016) *The Quantified Self: A Sociology of Self-tracking*. Cambridge: Polity Press.

Lupton D (2017) How does health feel? Towards research on the affective atmospheres of digital health. *Digital Health*. Epub ahead of print 10 April 2017. DOI: 10.1177/2055207617701276.

Maturo A, Setiffi F and Maturo A (2016) The gamification of risk: how health apps foster self-confidence and why this is not enough why this is not enough. *Health, Risk & Society* 17(7–8): 477–494.

Mol A (2008) *The Logic of Care: Health and the Problem of Patient Choice*. New York: Routledge.

Moore P and Piwek L (2017) Regulating wellbeing in the brave new quantified workplace. *Employee Relations* 39(3): 308–316.

Moore P and Robinson A (2016) The quantified self: what counts in the neoliberal workplace. *New Media & Society* 18: 2774–2792.

Munson S and Consolvo S (2012) Exploring goal-setting, rewards, self-monitoring, and sharing to motivate physical activity. In: *2012 6th international conference on pervasive computing technologies for healthcare (PervasiveHealth) and workshops*, San Diego, CA, 21–24 May. New York: IEEE.

Nafus D and Sherman J (2014) This one does not go up to 11: the quantified self movement as an alternative big data practice. *International Journal of Communication* 8: 1–11.

Neff G and Nafus D (2016) *Self-tracking*. Cambridge, MA: MIT Press.

Nissenbaum H and Patterson H (2016) Biosensing in context: health privacy in a connected world. In: Nafus D (ed.) *Quantified: Biosensing Technologies in Everyday Life*. Cambridge, MA: The MIT Press, pp. 79–100.

Pink S and Fors V (2017) Being in a mediated world: self-tracking and the mind–body–environment. *Cultural Geographies* 24: 375–388.

Pink S, Ruckenstein M, Willim R, et al. (2018) Broken data: conceptualising data in an emerging world. *Big Data & Society*. Epub ahead of print 11 January. DOI: 10.1177/2053951717753228.

Rooksby J, Rost M, Morrison A, et al. (2014) Personal tracking as lived informatics. In: *CHI '14*, Toronto, ON, Canada, 26 April–1 May, pp. 1163–1172. New York: ACM.

Schüll ND (2016) Data for life: wearable technology and the design of self-care. *Biosocieties* 11: 317–333.

Shih PC, Han K, Poole ES, et al. (2015) Use and adoption challenges of wearable activity trackers, pp. 1–12, https://www.ideals.illinois.edu/bitstream/handle/2142/73649/164_ready.pdf?sequence=2&isAllowed=y

Stokols D (1996) Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion* 10: 282–298.

Weinstein M (n.d.) TAMS analyzer. Available at: http://tamsys.sourceforge.net/ (accessed 21 August 2018).

Why Fitbit (n.d.) Available at: https://www.fitbit.com/dk/whyfitbit (accessed 12 September 2018).

Wijas-Jensen J (2014) *It-anvendelse i Befolkningen 2014. NYT Fra Danmarks Statistik Nr. 339*. Danmarks Statistik. Denmark.

Wilde N, Hänsel K, Haddadi H, et al. (2015) Wearable computing for health and fitness: exploring the relationship between data and human behaviour, pp. 1–23. Available at: https://arxiv.org/abs/1509.05238

Author biographies

Nanna Gorm is postdoctoral researcher in the Technologies in Practices research group at the IT University of Copenhagen. Her research centers on the development of activity tracking technologies, both in everyday life and workplace settings.

Irina Shklovski is Associate Professor at the IT University of Copenhagen. Her projects address online information disclosure, creepy technologies and the sense of powerlessness people experience in the face of massive personal data collection. She is very much concerned with how everyday technologies are becoming increasingly "creepy" and how people come to normalize and ignore those feelings of discomfort.