

Disconnecting the communicating body

On the human work of articulation, maintenance, and repair in the use of personal tracking devices

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ABSTRACT

In this chapter, I analyse how humans navigate recurring processes of digital disconnection and articulation work to manually repair and reconnect with their wearable devices. I ask what these processes tell us about the relations we form and experience as meaningful with our devices. Specifically, interviews and photo diaries on body-technology relations were conducted with couriers doing delivery services on app-based platforms, with employees who have volunteered themselves to have a microchip implanted in their hand, as well as with self-trackers using tracking devices embedded with sensors for various purposes in their private life. The vignettes in the analysis show how participants constantly navigate moments of disconnection and connection with their devices, resulting in them having to fix the breakdowns to stay connected and work on maintaining a meaningful relationship with their personal tracking device. The analysis shows how the characteristics of this work depend on the context of tracking, the material aspects and physical proximities of the relation between body and device, and the generated data.

KEYWORDS: breakages, repair work, maintenance, digital tracking technologies, body-technology relations

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Introduction

Digital tracking technologies are moving into many facets of everyday life, “at the intersections of key social arenas – between health and wellness, between work and life, and between accessibility and luxury” (Neff & Nafus, 2016: 121). Whether at work or in private life, these devices are also increasingly, and physically, moving closer to our bodies in new ways. For instance, in 2017 and 2019, Swedish and Danish employees in the Nordic region’s largest travel agency had microchips inserted in their hands at a corporate event to test new technological solutions to optimise the workplace environment and ease certain work-related practices for employees (Epoch Times, 2018; West, 2019). Today, about 3,000 employees can use their microchip for public transportation in Sweden by uploading train tickets to it via an app, or simply for checking in at their local gym (Markvardsen & Gram, 2017). The permeation of personal tracking technologies into intersections of everyday life is even more visible with the growing number of couriers in the streets whose work is based on the use of apps to track their bodily movements and work performances while delivering food for platform companies. In our personal lives, it is likewise becoming mainstream to use wearables on different body parts for monitoring bodily movements and functions, which are then transformed into data about one’s health status, training results, diet, mood, sleep patterns, chronic illnesses, and the like (e.g., Berg, 2017; Jansky & Langstrup, 2022; Lupton, 2016). At the same time, some digital tracking technologies are being used at workplaces to keep track not only of individual employees’ productivity levels but also of more personal and physically close aspects concerning their general health and well-being, thereby eroding the boundary between what is typically understood as private life and work life (Lomborg, 2022).

Usually, these devices are sold as tools that can help people become more efficient and productive in a variety of ways and optimise certain aspects of people’s bodies and lives when implemented seamlessly into everyday routines (Neff & Nafus, 2016). At first glance, by implementing these technologies into our everyday lives, we seem to be constantly connected. However, our connections with technologies that track us are inherently marked by moments of breakdown and disconnection: moments where intentions to engage in tracking for various reasons are not supported by the affordances of the specific technologies, thereby restricting us from using them in the way we originally intended (Lupton, 2016). As Lupton (2016: 75) noted, technologies that track us “may break down, fail to synchronise with other devices as they should, or lose their power or their internet connection”. In many ways, they “bear the marks of our bodies as we touch and handle them”, both in data and in a physical, material sense (Lupton, 2016: 41). In fact, everyday failures and disruptions are ubiquitous, and as some anticipate, are even built into our devices from when they are made by manufacturers in the tech industry, simply as a business strategy to lead users to replace

their broken gadgets with new ones (Fowler, 2022). However, it is when we as humans enter into close relations with such devices at the intersections of our everyday lives that these breakages become significant. It is the moments of disconnection from our devices that reveal how partnering up with them in various constellations shapes us and our everyday lives in certain ways, potentially by empowering us or making us more vulnerable.

In this chapter, I investigate the emerging use of digital tracking technologies, which are used in various relations to the body under forced as well as voluntary conditions. I argue that as humans, we are, in fact, always disconnecting from such devices, even when we experience being connected to them. As a result, we involve ourselves in various forms of continuous repair work with such technologies to maintain a sense of connection. On this basis, I ask how people are involved in repair work with various digital tracking technologies, and what these instances of breakdown, disconnection, and repair tell us about the relations we form and experience as meaningful with our tracking devices. By way of three vignettes, I explore empirical cases of managing and maintaining (dis)connection in cases of tracking in various proximities to the body, between work and private life. I investigate how Jackson's (2014: 223) "broken world thinking" – the idea that the world we build and live is, in fact, "always breaking" – can help us better understand contemporary human–machine relations, and how they become important to us. Related to the increased closeness and reliance between digital tracking technologies and humans, I explore and problematise how moments of disconnection can sometimes be a source of constant devotion, occupation, or even frustration rather than opportunities to let go of stress and regain a sense of authenticity, as usually suggested in studies on digital disconnection (e.g., Syvertsen & Enli, 2020). Regardless of whether one is disconnecting from voluntary or more externally forced relations with digital tracking technologies, I show how disconnection is associated with the work of rebuilding connection. In cases where people in my sample use digital tracking devices under more forced conditions, disconnection is associated with the work of rebuilding the connection in a certain way to meet external goals. On the other hand, in cases of using digital tracking devices under more voluntary conditions, disconnection is associated with the opportunity to rebuild the connection in several ways depending on one's personal needs and preferences.

Digital disconnection and the body

Research on digital disconnection has mostly centred on the mental and psychological effects of the over-digitalisation of everyday life (Moe & Madsen, 2021), leaving the physical and material aspects of the emerging use or non-use of digital technologies in relation to the body insufficiently researched. However, whether we connect or disconnect from technologies depends on either a physical collaboration or decoupling between a body, a

technology, and the data they share. Some of these considerations can be found in the post-phenomenological literature. For instance, Ihde (1990: 72) described “the various structural features” of ambiguous human–technology relations and pointed to the importance of studying how the human as a body interacts with its environment “by means of technologies”. This is relevant in terms of understanding how practices of connection and disconnection are both enabled and limited depending on the specific physical characteristics and contexts of the partnership between body, technology, and data. There is a difference between disconnecting from one’s phone compared with disconnecting from a smartwatch, a microchip, or a blood glucose sensor. However, only a few studies have investigated physical and material aspects related to disconnection from devices used in various conjunctions with the body.

In a study on food delivery couriers conducted by Andersson (2021), the physical and material aspects of the mobile phone as a digital tracking tool were analysed in relation to the dynamics of temporary disconnection from the delivery app. In this context, Andersson (2021: 200) adopted the concept of “dwelling” to study what happens in the moments of disconnection when workers are waiting for a new order to appear on their screen. He described such moments as times in which couriers need to stay attentive to incoming orders by holding the phone in their hand being ready to swipe the *accept order* beam in the app. But he also described how couriers work to actively fill the temporary moments of disconnection in between orders and deliveries by dwelling on the phone: switching between making calls to friends and family, checking social media, playing games, or paying bills, and returning to the delivery app at regular intervals to check for updates or orders (Andersson, 2021).

Also in a work context, but in a case of closer proximity between body and device, Gauttier (2019) presented a study of the acceptance and non-acceptance of “insideable” technology in the workplace, that is, employees’ considerations of whether or not to get an information communication technology implant (ICT implant) embedded inside the body. She argued that ultimately, non-acceptance of insideables is typically based on the need to maintain control over one’s own body, whereas acceptance typically emerges in the desire to pioneer and be able to enhance the abilities of one’s body (Gauttier, 2019). However, as Gauttier (2019: 102) noted, we tend to theorise technology use from the perspective that there is an “*expected performance*” – an optimal way in which any technology can and should work in contexts of use – and tend *not* to theorise technology use based on “*expected risks or bad consequences stemming from the use of this technology* [emphasis added on the first quote]”. As Graham and Thrift (2007) more explicitly noted, we often turn towards technologies as they manifest in their workings, and less often towards how they manifest in their unfunctionalities. We need to look at the plethora of negligence, opt-out, breakdown, and failure, and thereby at how disconnections happen in our daily interactions and relations with technologies all the time.

Technological breakages, repair workers, and articulation work

Jackson (2014: 222) argued that in society, two different realities exist: on the one hand, “an always-almost-falling-apart world”, and on the other, “a world in constant process of fixing and reinvention”. Acting as a focal point of these different realities, he argued that repair work is constantly taking place as part of maintaining what we know of as stability in a society where what is broken also gets physically and materially restored. This happens through “subtle acts of care by which order and meaning in complex sociotechnical systems are maintained and transformed, human value is preserved and extended, and the complicated work of fitting to the varied circumstances of organizations, systems, and lives is accomplished” (Jackson, 2014: 222). In other words, humans make continuous, and oftentimes tacit, efforts of trying to bring the broken pieces of tools and infrastructures together and into order in a way that makes sense and makes things work more efficiently within the specific context. Breakdowns and repairs are regular, ubiquitous, and mundane: They are not exceptional but a part of the lived experience. It is, for example, the acts of maintenance we engage in when we change the tires on our car, update our computer’s software, or buy covers or power banks for our smartphones. We are constantly repairing and preparing for breakages, or the “points at which progress is stopped due to material limitation” (Tanweer et al., 2016: 737). Looking at these points of material limitation and breakdown, and at the repair work that follows, enables the exploration of the “hidden dynamics, processes and powers” that constitute different relationships between human bodies, tools, and devices (Jackson, 2014: 229). In this way, looking through the lens of “broken world thinking” (Jackson, 2014: 221), that is, at “the processes of maintenance and repair that keep modern societies going” (Graham & Thrift, 2007: 1), opens up the possibility for re-imagination of the partnership between human bodies and digital devices as something that resides in the constant work, adjustment, and adaptation it requires for the two material units to come together.

As we work on maintaining a sense of stability with the digital devices we let into our daily lives and close to our bodies, we engage in what Strauss (1985) referred to as articulation work. Articulation work is mostly referred to in relation to the use of and collaboration between humans and computer systems in practice, whereas processes of breakdown, repair, and maintenance are not necessarily related to computer systems specifically, but to material objects and tools in a broader sense. However, computer systems are also material objects that only function based on collaboration at the intersection between digital tracking tools, people and their bodies, and their contexts of use. Building on Strauss (1985), Gerson and Star (1986: 258) described articulation as consisting of “all the tasks needed to coordinate a particular task, including scheduling subtasks, recovering from errors, and assembling resources”.

This means carrying through a course of action despite local contingencies, unanticipated glitches, incommensurable opinions and beliefs, or inadequate knowledge of local circumstances. (Gerson & Star, 1986: 266)

To put it in other words, it is impossible to anticipate every problem or incident that may occur in the real world using any system in our daily lives, including computer systems, whether in the form of a laptop, a smartphone, a smartwatch, or the like. In situations where unanticipated incidents arise, we deal with them by doing articulation work with the technologies, to get things done and make everything come together “so that work can go on” (Gerson & Star, 1986: 266). In practice, the result of articulation work therefore often appears as “workarounds” in our use of the technologies, and it thereby “misfits with the idealized representations of work that requirements have represented” or the expected performance (Gerson & Star, 1986: 266). Although articulation work does not fit into our original thoughts on how a given collaboration with our devices should take place, they work as “local closures” of our use of a system and are necessary in terms of fixing, for example, the lack of resources or technical and material limitations that affect one’s further work in a given situation (Gerson & Star, 1986: 267).

Therefore, articulation work can be considered a form of repair work where the human acts as a repair worker by collaborating with the given technological device to seamlessly make everything come together after a breakdown has occurred. To make things come together, the partnership between human and device “is shown to be a process of continual structuring and restructuring done *through*, *to*, and *with* both technology and people in an unselfconsciously conscious manner [emphasis added]” (Schmidt & Bannon, 2013: 356). To understand how the collaboration of continual structuring and restructuring – of breakdown, repair, and maintenance processes – works in practice, and what it reveals about the way we form relations with devices we consider meaningful, we need to pay attention to the “moment-by-moment flow of activity”, “the situated integration of tools”, “entwined action”, and “mutual adjustment” (Schmidt & Bannon, 2013: 356). Most importantly, attention must be paid to the materiality of these processes, as it is the physical properties of the partnership between humans and devices that set the framework for the kind of repair work that takes place and what meaning it has for people in the specific context.

Methods

Since January 2021, I have been conducting repeated interviews and photo diaries in Denmark and Sweden with people who are engaging with various digital devices that are tracking different aspects of their bodies, at work or in private life. Recruited through a mix of maximum variation and network sampling, the following analysis highlights six out of a total of twenty interviews, including

three illustrative photo diaries, conducted during 14 months of fieldwork. The selected material represents the greatest variety of participants' use of devices in the total sample, including smartphones, watches, and rings embedded with sensors, cycle computers, and power meters, as well as microchips and glucose monitors. The age group represented in the sample of the six selected participants ranges from 20–65, of whom three participants are women and three are men. Two participants were recruited in connection with their job as couriers for the Wolt and Foodora food delivery platforms in Denmark and Sweden, whereas one worked for a Scandinavian travel agency. The remaining three participants were Danes and were recruited based on their use of self-tracking devices in their private lives. The sample thereby also includes cases where the management of disconnection and connection is based on voluntary as well as more forced forms of engagement with digital tracking technologies.

I was invited into the homes of each of the six participants for a semi-structured interview either physically or over Zoom, depending on what the Covid-19 restrictions allowed us to do. The interviews had a structure circling around everyday examples of how the participants experienced using and interacting with their devices in conjunction with the body for each of their specific purposes. However, I ensured that there was room for the participants to weigh and prioritise talking about the aspects of their experiences of using the tracking devices that were of particular importance to them, after which I again sought to get the participants to link their more abstract thoughts to concrete everyday encounters with their devices.

After having met with the participants, our conversations were transcribed and re-read before I continued to pull the analytical threads that had appeared during the interviews and later proved to be consistent across the material. Throughout the analytical process, I identified a common theme that was brought up by each of the participants, despite the variation of cases, but seemed to be differently linked to the purely material and physical location of the device in relation to the body, although the body was not necessarily the focal point for the tracking practice itself. What the participants were in fact all describing was their experiences of maintaining the relationship they had formed for various reasons with their devices, which was oftentimes linked directly to experiences of moments of breakdown followed by repair work. They described their role as repair workers, or, to use Jackson's (2014: 234) wording, "maintainers", "fixers", and even "breakers" of the partnership with their device or devices.

To illustrate the physical and material aspects of the human–device partnerships and their influence on the experiences of breakdown–repair processes as part of forming and maintaining the partnership with various types of devices, the following analysis is structured into three main vignettes, each consisting of two related narratives. Due to its holistic representation of empirical phenomena, the vignettes are particularly useful for describing

the above-mentioned “moment-by-moment flow of activity”, “the situated integration of tools”, “entwined action”, and “mutual adjustment” (Schmidt & Bannon, 2013: 356) that come into play when people work on maintaining a relation to their device. In accordance with Jackson’s (2014) broken world thinking, it thereby becomes possible to analytically tease out the many subtle, continuous, and oftentimes tacit efforts of repairing, maintaining, and transforming things that are meaningful to humans, and how such processes of managing shifts how being disconnected and connected with one’s device might look different for different people.

In the analysis, the first vignette describes the managing of (dis)connection with tracking devices used in a work context. This vignette illuminates experiences of maintaining the body–device relation when tracking the body at a distance – both in terms of the data being collected, but also in terms of the physical encounter between body and device. The second vignette describes the managing of (dis)connection with tracking devices used in private life. It illuminates self-trackers’ experiences of maintaining the body–device relation in cases of tracking in-between, that is, when devices collect internal data about the body, and in some cases move closer to the body in physical distance. Lastly, the third vignette describes the managing of (dis)connection with tracking devices used across work and private settings. Based on two narratives from an employee and a self-tracker, it illustrates experiences of maintenance when tracking the body from the inside, that is, when devices are implanted into the body for different reasons. Taken together, the vignettes thereby present different realities associated with breakdown-repair work related to tracking the body at different physical distances, contexts, and scales of connection. As instances of connection or disconnection happen based on either a physical collaboration or a decoupling between body, technology, and data, the specific physical configuration of body and device – and how it is constantly going through joint processes of breakdowns, repair, and maintenance – is crucial for understanding how we form and experience relations with certain devices as meaningful for us. As we shall see in the analysis, these processes of managing ongoing states of disconnection and connection – of breakdown and repair – mean different things for the relationship we form with the device, depending on its specific material framework. In other words, what processes of maintenance mean for these relations depends on how and to what extent we physically collaborate or decouple from the given device, that is, how we experience that the device helps us when we go along and collaborate with it in physical practice, and how we experience the problems it causes us when the collaboration does not work due to material limitations and we get pulled away from the device.

Analysis

Managing (dis)connection in cases of tracking from outside the body

I met with Wolt courier Victor on Zoom on a Thursday morning in late April 2021. With emphasis on the flexibility of his work, he explained to me how he can more or less choose himself when he wants to work. However, there is usually not much to do in the morning. Therefore, Victor works from around 17:00–21:00 and uses his electric moped 45 which, however, has a limited range. This means that, unlike gas mopeds that can drive all day, Victor's moped can run for 3.5 hours followed by a 10-hour recharge. For Victor, this fits perfectly with the time of peak delivery which is indicated in the Wolt app. He told how he finds the moped appropriate:

In terms of maintenance, an electric moped is also just easier than a gas moped and a car. So, I think it's very cool the way I do it. I don't think I would want to do it by bike [...] it always breaks down and needs to be maintained and stuff like that.

However, with the relatively short time span before another power charge is needed, the maintenance of the moped is what ends up drawing the line between work life and leisure in combination with the app's indication of peak times. When Victor goes online, he places the phone in the phone mount and “surrender[s] to the algorithm” as he presses the button in the app and lets the algorithm “drive [him] around” Copenhagen for 3.5 hours. However, he told me about a time when he was new to the job, and his phone turned off when he was in the process of a delivery, as it was being exposed to wind, rain, and cold weather. After managing to turn the phone back on, by “warming it up” and “wiping off the water”, he was able to carry through the course of action and complete the delivery despite the unanticipated glitch. The incident made him start bringing a power bank with him every time he works to ensure that there is enough power for the phone to run the app while at work, thereby minimising the risk of future possible moments of disconnection.

About nine months later, I met with the Swedish courier Ramesh, who is working in Malmö. Unlike Victor, Ramesh uses his car at work. However, prior to our interview in early January 2022, I received a text message from him with a picture of a burned car (see Figure 10.1) asking if we could move the interview to another date. Ten days later, Ramesh returned to me after having had the car fixed so he could work again. I met with him virtually, he on his phone in his new car. Ramesh is an experienced courier and has enjoyed working for around twelve other delivery companies back when he was living in Denmark. By manoeuvring between working as a courier for the Swedish food delivery platform Foodora and working as a courier for Wolt,

he manages to deliver enough orders so that it corresponds to a full-time job. He explained to me that “if you are working with two companies, then obviously if there is a problem with one, you can go with the second one”. As an example, he explained how Foodora couriers are allowed to work for a maximum of 40 hours a week (corresponding to a Swedish full-time job), and car couriers only for four hours in a row, due to rules from the Swedish Transport Agency. Additionally, as Wolt has only recently been launched in Malmö (at the time of the interview), it often requires couriers to “dwell” on the phone for up to 15 minutes in between orders, which Ramesh rarely has time or money for. To avoid these disruptions he would otherwise have in his working day had he worked for just one of the platforms, he combines both apps by switching between logging on and off to fill in the gaps. To otherwise maintain a seamless work structure, Ramesh uses a backup phone with both food delivery apps installed:

If you have a spare phone, like now where I’m having the app in two mobiles [...], and if there is a problem with the net or something, then you can use another mobile and then it doesn’t make any problem.

As such, by assembling resources such as backups of phones and apps for work, Ramesh is prepared for any problem he may encounter, enabling him, together with the technological tools, to plan and coordinate life as a platform courier working from two different apps.

As exemplified in Victor’s and Ramesh’s stories, reparation and maintenance of moments of disconnection from tracking outside the body becomes primarily a matter of “assembling resources” (Gerson & Star, 1986: 258). In Victor’s and Ramesh’s cases, assembling resources refers to everything infrastructural, such as installing more of the same apps on several backup phones, to having power banks and vehicles ready for tracking at very specific times during the day. Disconnection from tracking in these cases are typically moments where the app, which is necessary for solving a specific, generally delimited task is inaccessible and thereby hinders the user from completing the particular tracking action or sequence at the required time. Along these lines, as the work of repairing and maintaining the tracking is located outside the body, it takes on a practical rather than personal meaning, where the interaction with the device, and the data created as a result, is not addressed directly at the body but rather at external goals to be achieved in the partnership.

FIGURE 10.1 MMS of Ramesh's broken car



Comments: The photo was taken by the participant Ramesh in January 2022. Ramesh depends on his car to get around faster in his job as a courier which means that car damage like this makes it impossible for him to work from his app. The car damage necessitated engagement in practical work to solve the situation so that tracking at work could go on. Normally, Ramesh keeps two phones in his car with two food delivery apps installed on both. When at work, the specific app in use tracks where Ramesh is, in the extension of his car, and how many orders he picks up and delivers.

Managing (dis)connection in cases of tracking from the surface of the body

The couriers in my study engage in a more delimited use of their tracking technology which, in their specific case and setting, is used for delivering orders. In contrast, leisurely self-trackers sometimes seem to engage in more or less permanent relationships with devices in their private life. One example is Peter, whom I met for an interview in central Copenhagen in mid-February 2022 to learn more about his experiences of using an Ōura ring for tracking sleep and exercise. Peter quickly refuted my question when I asked him for an example of how he collaborates with the ring and the related app and replied, “Well, I don’t. I don’t. That’s what’s cool. There’s no maintenance. You can access it at any time and track your data, so I don’t need to do that [collaborate]”. He then added: “Well, if I’m going for a walk, I would like to see how far I’ve come. Or if I run or play football, I look at it. Otherwise, I don’t”. In fact, Peter does not experience any need for maintaining the tracking facilitated by his device other than the 15 minutes once a week, when the ring needs to be charged. Except for that, he wears the ring all the

time. Instead, maintenance of tracking for Peter seems to be centred around his body, where the ring helps him pay a little extra attention to health-related aspects such as time and quality of sleep, stress levels, and exercise and recovery patterns to avoid physical breakdowns. In terms of exercise, however, the ring requires Peter to add the specific type of exercise to the app for its predictions to be accurate, as “it [the sensor in the ring] cannot feel what I have been doing”, Peter explained. Thus, to prevent his data collection from failing and not being usable, Peter needs to manually feed the ring and the associated Ōura app with metadata about the movements it has already registered. Only through the work of completing his personal data, by adding closures and pieces of information to glue the data cracks together, is Peter able to maintain a meaningful relation with his ring and the data that come out of wearing it on the surface of his body.

Like Peter, the self-tracker Lene also tracks her exercise, but she uses a social network app for athletes, called Strava, to keep track of her training results. She has a bicycle computer and a power meter, but she mostly uses her Garmin watch, which is connected to Strava. However, her watch is getting old: “It quickly gets outdated, doesn’t it?” she asked me, in agreement. She has always had sports watches and made sure to update them once in a while, as she wants the best and latest version. She explained that when using Strava with her Garmin watch, the app automatically shows the address where a route is started. This is a well-known problem for many Strava users, and for that reason, Lene has deliberately begun to start her Garmin watch a few minutes after she starts her run, as she does not want other people to know where she lives. Thus, she starts out walking the first distance, after which she presses play to start the tracking feature of her watch as she starts running. To Lene, “the run does not really start before [she] starts running” either, so for that reason, she is extra careful in her coordination of exactly when and where to track, because she wants her data to be as accurate as possible and not count the distance she has walked into the total run. To collect as accurate data as possible, and to keep a good time on her runs, Lene has even set her clock to automatically stop when she is standing still, which she usually does to take pictures of something she sees on her run or walk (see Figure 10.2). In this way, while Lene is still physically wearing the watch, she pauses its timer to maintain precise running data by sorting out the fragments that cannot be used and thereby composing the usable data fragments of the run into an overall summarised run that is then ready to be shared with pictures, time, distance, elevation gain, and so on, with fellow athletes in Strava. However, sometimes, the app mistakenly posts unedited routes before Lene has had a chance to add photos and descriptions of her run, which can cause great frustration.

As exemplified in Peter’s and Lene’s stories, reparation and maintenance of moments of disconnection from tracking on the surface of the body is “a process of continual structuring and restructuring done through, to, and with both technology and people in an unselfconsciously conscious manner”

(Schmidt & Bannon, 2013: 356). It is about creating “local” or situational “closures” (Gerson & Star, 1986: 267) to the data that are created in the partnership, to make sure that this data reflects them and is personally shaped and meaningful. Thus, disconnection from tracking in these cases are typically moments where data are in the process of becoming personal, and not yet experienced as reflecting them or as fitting into the unique circumstances of their use. When tracking is located on the surface of the body, is moving closer in physical proximity, and is collecting data directed at or even inside bodies, for example, about sleep patterns, place of residence, or training results, the work of repairing and maintaining becomes about personalising tracking practices. Through this, maintenance almost becomes an investment in oneself and one’s body, achieved in the partnership.

FIGURE 10.2 Breakdown of Lene’s walk into small stops along the way to take pictures for Strava



Comments: The photo was taken by the participant Lene in October 2021. Lene uses Strava to compose data fragments and photo snippets into an overall summarised run, as shown in the figure. This task is necessary for Lene to make use of her data as she sometimes sets her watch to, either manually or automatically, start and stop during runs and walks for it to not track her for various reasons.

Managing (dis)connection in cases of tracking from inside the body

In March 2022, I was fortunate to get to interview Emma, an employee at a Scandinavian travel agency. Emma has a microchip implanted in the same hand that she usually also wears her Apple smartwatch for tracking her walks. However, because her Apple watch ran out of power, she forgot to put it on that day. Sometimes she even forgets that she is, in fact, also permanently wearing a microchip: “I sometimes forget that I have it. It’s just there. And that’s because we don’t really use it here [at the office]”. To begin with, Emma would have liked to have it inserted at the tip of her index finger, as “it would have been easier to just press; just like one would press a button”, but the skin was too thin for that, so she got it injected in her hand instead, between her thumb and index finger. According to Emma, the chip cannot be used for much in Denmark yet, but she expects it to be implemented in the coming years “so everything is at hand; literally, at hand”, she said. “It does not help me that much yet. Not in this office. Then you need to go to Stockholm [to use it]”, she added and explained how she can “beep” herself into the Swedish office if she has forgotten her card. In the Danish office, however, the building is owned by another company, and they have chosen to implement a door system that does not work with the chip. However, Emma rarely takes advantage of the opportunity to open doors in the Swedish office anyway, and that goes for the cabinets in the Danish office too, which she can, in theory, also open with the chip, but never does. Although Emma is constantly and physically connected to the device, it appears that the opportunities for using it are materially and technologically limited, resulting in her feeling disconnected from the chip although it is permanently connected to her. In this case, maintaining the potentiality of tracking via the use of the chip from inside the body becomes, as she describes it, more of “a fun gimmick” that she can “play with” or “show to other people”. It becomes a form of a mental “workaround” and adjustment that misfits with the “idealized representations of work” (Gerson & Star, 1986: 266) with the chip. She likewise showed me the associated app, NFC Reader, where she can scan and register information from her chip: “Let’s see if it works”, she said as she rubbed the phone against the back of her hand a couple of times. Finally, something appeared on the screen of her phone. She showed how the app can be programmed so it can be used to log on to social media, but Emma does not perceive herself as being technical enough to figure out how to set up this feature. However, she told me about one of her colleagues who “used the chip to log on to Facebook, but now he has deleted his Facebook [profile]”. Other colleagues had surgery to have the chip taken out, while another colleague realised that the chip had disappeared in her body: It was “crawling in the body – so, it disappeared”, Emma said. Having a tracking device inserted into the body facilitates a partnership with technology that is

intimate in another way than in cases of maintaining tracking from outside or from the surface of the body, although the data resulting in tracking from inside the body are not necessarily *about* the body, as in the above-described cases of maintaining tracking from the surface of the body. In Emma's case, for instance, the chip is not considered a tracking device per se, but since it is possible to open doors and cabinets, print, and log on to social media, and so on, and in some cases even possible to travel by public transportation, the data that are stemming from the body are still being registered somewhere.

However, for Marie, a woman I interviewed who has had Type 1 Diabetes since her youth, the data that come out of maintaining tracking via her glucose monitor – a sensor with a needle that is inserted under the skin on her arm – give insights into what is going on inside her body. To maintain tracking from the sensor, Marie must replace it with a new one once every two weeks, as they do not last forever. In connection with our interview in March 2022, she showed me a new type of sensor which she was going to try out as soon as it was time for her to replace the sensor she was currently wearing (see Figure 10.3). To make it easier for her to keep track of low as well as high blood sugar levels, the new sensor has an alarm that is attached to the associated app that Marie has installed on her phone, so that she gets notified about changes in her body and is able to react more quickly to them than if it, like now, is only up to herself to check her blood sugar levels by scanning the sensor with the app. Marie is already used to getting notifications from her app and current sensor to help her maintain the tracking, and thereby her body, for example, when it is time to replace the sensor or “repair” fluctuations in her blood sugar with insulin. However, the alarm feature of the new sensor makes her nervous: “The first thing I thought when the nurse said, ‘now I think we should try these with alarms’ was ‘how can I get it to stop beeping?’” At a consultation, her diabetes nurse, however, explained that it was still possible to change the general settings of the tracker to make it adapt to one's personal needs: “She was like, ‘you just go to...’ and so on, and ‘everything is possible’; ‘go to settings – general – notifications – and...’ something. I need to talk to her again”, Marie said, and continued:

That's my only concern; how aggressive it gets [...]. One thing's to sit in the office with my colleagues and I can check [my levels ...], but if it's constantly beeping, then they're suddenly invited in my life and private sphere.

Thus, the “idealised representation” (Gerson & Star, 1986: 266) of how an updated sensor would work better with an alarm to assist her in maintaining the tracking of her blood glucose levels misfits with her expectations of how the tracking device is supposed to adjust to her body and circumstances. In planning how she might have to change the settings, she is doing articulation and repair work to put together and maintain a certain personally meaningful connection between the sensor, body, and data, allowing her to maintain her health.

As exemplified in Emma’s and Marie’s stories, reparation and maintenance of moments of experiencing disconnection from the tracking that takes place from inside the body is a process of “mutual adjustment” (Schmidt & Bannon, 2013: 356). The mutual adjustment here is experienced in different ways depending on the context of tracking and maintenance, but it is in both cases shaped by the fact that the tracking device is physically paired with the body. It is about finding a way in which the two can act synergistically together to achieve something more by extending the body and overcoming its limits. Thus, disconnection and breakages occurring in cases of tracking from inside the body are typically moments where tracking might feel redundant, alienating, or bothersome. These are moments where the user needs to do repair work to unite the body and technology. Thus, maintenance becomes the somewhat mental task of working towards connecting and merging one’s life with the device in the body, rather than accepting it as an artificial and separated entity.

FIGURE 10.3 Supplies for Marie’s repair work and maintenance of blood glucose tracking



Comments: The photo was taken by the participant Marie in December 2021. The photo shows a box of new sensors for Marie’s tracking of her blood glucose levels. Marie needs to replace the sensor every two weeks for tracking to go on and thereby needs to always make sure she has a box of new sensors available at home so she does not run out and become unable to track herself for a longer period of time.

Concluding discussion: Disconnection as default

The three vignettes provide insights into how breakdowns may occur in several ways in the use of digital tracking technologies of various kinds and for various reasons. In addition, they provide insights into how humans also repair and rebuild their relations with digital tracking technologies in different ways, and how this depends on the context and the physical characteristics of the relation between body and device, but also on the role that the generated data play in connection with this.

Breakdowns are moments when people experience digital disconnection from their devices, and as the analysis indicates, it happens all the time. As revealed by the vignettes, moments of digital disconnection can be but are not restricted to breakages of the physicality itself of the digital device at hand, or of other technological tools that are not necessarily digital but used in extension to the digital device, which is then used in partnership with the human body: In the couriers' cases, for instance, this is the experience of suddenly not having a functioning vehicle or smartphone, and thereby being cut off from their use of the tracking app for some time. However, disconnection simultaneously encompasses breakages occurring in the use of the digital device at hand, that is, in moments of disconnection from the data that is generated when connected to the device: In the self-trackers' cases, for instance, this is the experience of having to put a certain amount of extra work into building and using one's data that is generated in the body-device relation – a form of oftentimes invisible data work (Pedersen & Bossen, 2021; Star & Strauss, 1999), but a crucial part of making sense of data. As Pedersen and Bossen (2021: 2) put it, “data requires work”, as it has to be “generated, shaped and presented – by people” to become meaningful. Additionally, moments of disconnection may be moments of having difficulties with creating the desired relation with one's digital tracking device: In the two pioneers' cases, for instance, where a patient reflects on trying out new body-sensors for blood glucose monitoring, and an employee in a private company reflects on experimenting with microchip implants, disconnection is the experience of not blending properly with the tracking device – the experience of feeling awkward or powerless together with the device.

Thus, intended seamless use of digital tracking technologies is constantly breaking down along the way and is thereby in need of different types of repairs. Here, the material configuration of the relationship between the body and device, that is, whether it enables tracking of the body from outside, inside, or from the surface, is crucial for how people are involved in a certain type of repair work and thereby for how they, as a result, experience being in the partnership they are working on forming. The concept of articulation work contributes to nuancing exactly this: the specific type of repair work that is taking place and its significance. As a concept, it makes it possible to study the (repair) work itself, that is, the work “that people must engage in in order to make

the cooperative mechanisms developed to support different aspects of work in complex environments fit together and fit to local circumstances” (Schmidt & Bannon, 1992: 22) – in the case of my analysis, the work invested in making the body–technology relationship work. Subsequently, it thereby contributes to gaining an understanding of what types of significance the given tracking device might be assigned in different body–technology relations, as humans constantly work on maintaining a particular connection to it. The latter is also shaped by the context in which the partnership plays out, and more knowledge is needed in terms of how, for instance, maintaining tracking from the surface of the body might also play out in work contexts, such as described in a recent study conducted by Borenstein (2021) about tracking from the wrist via the use of GPS watches of top female Ethiopian athletes, just like the use of tracking devices inside the body is already being suggested to employees in certain companies.

For the two couriers in this study, repairing and maintaining the delivery app’s tracking of the working body meant taking care of breakdowns and repairs of everything from phones to power banks and cars. If they did not manage to stay connected to the app, they would not be able to get enough deliveries to maintain a stable income. Thus, in their cases, connection was needed to be able to carry out certain work-related tasks, and their maintenance of tracking to avoid disconnection was centred on something external to the body, namely deliveries and money earned. For the self-trackers, the work of maintaining a stable connection was centred around the body and the data generated about the body. Here, connection was needed to care for, optimise, and perform with the body via continuous attention to and shaping of personal data patterns, depending on the specific aspect of the body being tracked. In the last vignette, maintaining tracking inside the body was important to maintain a certain sense of self, as it changes the moment a device becomes permanently implanted in the body, whether for voluntary or coerced reasons. In other words, a feeling of being connected was fundamental for the experience of one’s self, body, and technological implant as a unified entity. In these ways, the work of maintaining and repairing the body–device relationships helps people ground themselves, because they actively participate in defining why and how their attachments are worthy of care (see Andelsman Alvarez, Chapter 12 in this volume). At the same time, the default of disconnection in the use of digital tracking technologies in various proximities to the body was indirectly considered as something to avoid rather than embrace. Moments of digital disconnection due to digital breakages were experienced as a workload and burden rather than “breathing space” (Savolainen & Ruckenstein, 2022: 5). On the contrary, it was the moments of connection that took shape as breathing spaces. Connection was perceived as the ideal stage in the partnership between body and technology because it allowed the two to work seamlessly together with minimal interference. To push against disconnection by constantly repairing the breakages, articulation work was done through “continual structuring and restructuring” processes

(Schmidt & Bannon, 2013: 356) of data; by “assembling resources” (Gerson & Star, 1986: 258) to repair certain digital infrastructures allowing one to engage in tracking; by finding “local closures” and “workarounds” (Gerson & Star, 1986: 266–267) to solve problems related to experiences of being disconnected from tracking; and by trying to “mutually adjust” oneself and the device (Schmidt & Bannon, 2013: 356) to determine how to stay connected to tracking technologies in a meaningful way.

In any form of tracking presented in the analysis, maintenance is putting more work on the shoulders of the human, and the human’s responsibility is being moved to the forefront by way of handling the uncertainty, breakdowns, and moments of disconnection. As shown in the analysis, what the people in the present study described was how disconnection required constant devotion and occupation in making the partnership with tracking technology work, and how it could even lead to frustration. Thus, my analysis points to how digital disconnection is not necessarily a negative choice, but a dynamic of processes of breakdown followed by repair. As Kaun (2021: 1574) has likewise argued, “contemporary relationships are characterized by a dynamic of ending, breaking, and waning that intertwines positive and negative choices or bonds and non-bonds”. Pointing our focus to the margins and unfunctionalities of our encounter with contemporary digital devices, and the oftentimes hidden and tacit processes of repair work that are invested and prioritised to maintain our use of tracking devices we find meaningful for various reasons, tells us something about how people are already bonding with digital tracking technologies in a very physical sense, and that they are vulnerable to the moments of disconnection they experience. But it also points us in future directions of how people imagine bonding in new or different ways: partly how such developments might shape the human body in new ways when it connects in close partnerships with digital tracking technologies, and partly how inevitable and ubiquitous moments of digital disconnection potentially might put even more work on our shoulders in the future, at least if our focus is on maintaining the status quo and the experience of being constantly digitally connected.

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