3 Self-Tracking Practices of "Doing Health"

Mobilizations of Data and Technological Inscriptions of (Un)Certainty

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Introduction

"Look", Tom says, showing me the screen of his smartphone. We are in a tiny smoothie and snacks bar in Vienna. He works here a few days a week in the late mornings. Later in the day, he will run to the fitness center where to exercise and work as a fitness coach. "Here you can see my performance on the app. And here", he scrolls down a bit, "I can see how I did yesterday… Or here, for example, I get a summary of last week. It's all in there." On the display, I see data organized into various sections with different categories such as running, walking, heart rate, calorie consumption, and so on. He scrolls so fast through the app I cannot make out many details, but at this point in my ethnographic research I am already familiar enough with the way these self-tracking apps operate: The app receives data from a wearable tracking device. In Tom's case, this is a so-called "smartwatch" he wears around the wrist. The device's built-in sensor technologies enable the recording of different kinds of bodily information, and this data is then visualized on the screen of the user's smartphone app. How does Tom engage with this data, though, what does it tell him and how does it become meaningful in practice?

Self-tracking technologies such as Tom's smartwatch give rise to quite different kinds of practices—not only because of the variety of software and hardware, or the specific bodily activity tracked and translated into data, but also because of the ways they can become meaningful as well as useful for different actors on different scales. For Tom, but also for Tessa and Sarah, who became the main participants in my research, self-tracking is first and foremost a tool for understanding one's body. More precisely, it is about understanding it *better*—as in getting closer to particular kinds of information of the body, an underlying truth that can be uncovered, accessed, and known with the help of technological mediation. To engage in self-tracking not only provides them a novel kind of knowledge about their body and its doings, but the

recorded data is supposed to be used to adapt these doings, adjusting them accordingly. Self-tracking is about managing the body, taking (good) care of it.

"Doing health"

My notion of "doing health" refers precisely to the increasing reach of the particular logic of self-tracking into the field of medicine and health: Through the systematic and purposeful quantification enabled by these technologies, the body and specific activities, states and processes become knowable in new ways which open up new possibilities for management and control of bodies. In the field of self-tracking, health becomes something that is *done* in an ongoing way. It is about *becoming* healthy, as in an ontological sense (Deleuze and Guattari 1987). Rather than a bodily property in opposition to a lack of health in a dichotomous sense, health is enacted as a project that requires specific and active doings of care.

My concern, then, is for anthropology, and for medical anthropology specifically, to take notice of the diverse current endeavors of implementing self-tracking into health care systems, to engage with the logic of managing bodies that self-tracking practices emerge from, and to take seriously actual as well as potential effects of these shifts of doing health. I contend that this shifting notion of health is becoming increasingly pervasive and normative: By developing and applying measures and measurements, doings are captured into a feedback loop; signals are recorded, quantified, and fed back to the individual to trigger a process of ongoing adjustment. The current advancements in the tech development sector result in more precise and thus more "objective" technological measurements and an increased accessibility as well as affordability of these features. But more than that, the scope of self-tracking itself is continuously expanding in critical ways through explorations of new possibilities for measurement and recording of more and more aspects of human being-in-the-world. It is thus crucial to consider the ways in which these measurements become potentially powerful and to ask what is at stake when German health insurance companies, for example, aim at implementing self-tracking technologies into their programs and policies. I argue that this altered understanding of "health-as-doing" that requires particular attention, as well as the integration of technological tools to generate knowledge and instructions on how to "do" health, emerges with/in new uncertainties about the body and its being-in-the-world. I will further explore the affectivities that emerge with self-tracking and how, in the different modes of doing health encountered in my field(s), uncertainties become mobilized and distributed across different sites.

Methods, field sites and theoretical approach

My research on self-tracking technologies took place from 2017 to 2019 across different field sites in Vienna and Berlin. After an autoethnographic self-experiment as a first exploratory approach to self-tracking, I focused on individual practices of moving-through-the-world with self-tracking technologies. I conducted ethnographic research in Vienna over a period of three months, employing participant observation, informal conversations, and semi-structured interviews in research with several individuals who regularly engage in self-tracking. The core of my analysis of user practices builds on data from research with Tessa, Tom and Sarah who allowed me to accompany them during their tracking routines. Although they are situated in different settings and engage in different kinds of self-tracking, they are in the same age group (25 to 35 years), the three of them are able-bodied, part of the dominant white mainstream society in Austria, speak fluent German, and working as employees. Their technological knowledge and skills differ to some extent, but they must be considered as technologically savvy. All in all, they fit the ideal of the user that is configured into the technological design, which enables rather smooth interactions with their respective self-tracking technology.

In a second step, and to get a better understanding of these technologies not as given but as emerging from situated practices of technological design, I approached diverse start-ups with a focus on self-tracking technologies. I conducted semi-structured interviews and had several informal conversations with different people in three tech start-ups in 2019 in Berlin to gather insights into perspectives and practices of design. If gaining access to self-tracking start-ups within the highly competitive field of technological innovation already posed a considerable challenge, I hit an invisible wall in my attempts of "studying up" when trying to get access to stakeholders of health insurance companies, with all my interview requests to gain information on their efforts of integrating self-tracking technologies into their programs being denied. Therefore, I needed to resort to publicly accessible information, but also obtained further insights in interviews with tech designers who would discuss the issue with me.

In my analysis, I aim at bringing together different methods, field sites and more-than-human agency constitutive of the phenomenon of self-tracking. To analytically consider self-tracking in terms of practice theory proves useful insofar as it grasps different actors as parts of practices instead of assuming human-technology relationality either in terms of individual autonomy or technological determinism. Instead, a practice theoretical lens allows for considering the ways in which different kinds of technologies, subjectivities, and bodies come into being with/in practices. To conceptualize the human-technology interface, I furthermore found the notion of the "script" particularly helpful. Madeleine Akrich (1992) proposed to think of technological design as script: Technologies are scripted with implicit

assumptions, values, understandings, but most importantly with instructions for doings, for how to engage with the technology in question. The script-approach has been further developed by various scholars concerned with the ways in which technologies through their design delegate competencies, actions and responsibilities, and the ways these scripts are potentially challenged and re-scripted (see for example Oudshoorn et al. 2004). Suchman (2007), in turn, describes what she calls the *strategic vagueness* of the technological script, in contrast to a more *pre*scriptive-like understanding of the concept. In my analysis, I mobilize this approach to consider the ways in which self-tracking technologies become scripted with/in design, and to consider the affordances of these technological scripts in emerging practices of usage and the multiple kinds of doings they evoke.

Self-tracking in practice: Data discussion

Drawing on ethnographic material on self-tracking in both user and designer practices, I focus specifically on doing health as a meaningful mode of engagement with/in self-tracking practices. After a short discussion of the term self-tracking (2.1), I will discuss emerging self-tracking practices as they mobilize self-tracked data (2.2), particular doings of health and the ways these are scripted into technological design (2.3), and finally provide insights into ongoing projects of implementing self-tracked data into health care and health insurance in the German context (2.4). In the last part (2.5), I interrogate my material specifically in terms of the affectivities and multiple kinds of uncertainties that emerge with/in self-tracking technologies.

Introducing the phenomenon of self-tracking

What exactly *are* self-tracking technologies and what kind of self-tracking practices am I discussing in this paper?

To describe self-tracking as a set of dispersed yet interrelated technologies, practices, and increasingly also policies, has proven a peculiar task since the very beginning of my research. When I started looking into the field of self-tracking in 2017, I had only a vague idea of something of the kind of a smartphone app you use to track how many steps you walk a day. The phenomenon I will call self-tracking here is discussed under varying terms—such as "quantification of the self" or "lifelogging", with of course diverse German translations of these terms. This was certainly a challenge for my research regarding literature and public media discourse as well as setting up the field research, but it also says something important about the heterogeneous and fragmented character of these technologies: They emerge not necessarily as a novel innovation but find their way into standard smartphones, sports gear, and

even into items as familiar as a wristwatch. The idea of tracking activities or tasks itself is not radically new, and thus affords for smooth and often almost unnoticeable integration into everyday activities. I found that indeed many people make use of self-tracking functions without identifying or thinking about these practices as self-tracking—the most prominent example being the step tracking function that does not require any additional knowledge or equipment. Tom and other individuals I encountered in my research who engage in self-tracking practices in a purposeful and in an elaborated way just refer to the name of the app, or of the brand of the technology they use. Technology developers, in turn, situate their work within fields such as fitness, lifestyle or the medical sector, for example, but not necessarily in terms of self-tracking in an explicit way.

The lack of an encompassing term points to the fact that these technologies are dispersed across different scales, actors, and practices rather than comprising a coherent field with a specific directionality. Indeed, the scope of self-tracking seems to be expansionary, towards increasingly elaborate tracking of activities, bodily states and processes also with/in practices in the field of medicine and health. The notion of self-tracking as a perspective on the abstract entirety of these phenomena has proven a useful tool for my analysis of the particular logic these emerge with/in. And while some of the readers might have already had an idea of what self-tracking is about, it is crucial to notice the elusive ways in which these technologies operate as they emerge with/in diverse and fragmented practices and policies across different sites.

Thereby, public discussion, evaluation and critique are largely averted, or at least significantly delayed (see also Farrington and Lynch 2018: 5)—while the size of the billion-dollar market of data-generating technologies rapidly increasing (Matthewman 2018: 34). All the more important it is to put a spotlight on self-tracking practices and the notions of health they emerge with/in. The recent years have seen a rise of scholarly engagement with these novel forms of data generation and evoked critical analyses of what has been called "datafication" (e.g., Lupton 2016, Sumartojo et. al. 2016, Schüll and Ruckenstein 2017) of various aspects of life. While Lynch and Farrington (2018) propose a framing of data tracking technologies as "personal medical devices" in their anthology "Quantified Lives and Vital Data" and my analysis tries to center the very practice(s) of self-tracking, in which these technologies emerge—rather than taking these as point of departure. Arguably, the logic of self-tracking largely evades established boundaries of what is considered "medical" and instead alters practices of doing health across diverse contexts and fields.

Mobilizations of data at the human-technology interface

Self-tracking technologies measure, record, and capture signals from the body and turn them into data points that become accessible on different types of screens, e.g.,

smartphones or smartwatches. From the ongoing flow of being-in-the-world, individual units of an embodied being-in-the-world emerge as data points in this kind of measurement. This has an intriguing effect on the temporality of being-in-the-world: These units of being-in-the-world emerge as data points allocated within seconds, minutes, days, weeks, and years and effectively establish being within a linear temporality. As these recordings happen ongoingly, single data points within time accumulate into data sets, retrievable at any given moment—such as the moment described above of Tom showing me the data in his self-tracking app. Different kinds of statistics and other visual analyses organize information into data in meaningful ways. Specifically, these accumulations of data over time are rendered meaningful through generating notions vital to self-tracking practices such as "progress" and "improvement". Similar to Tom's description of how he had been able to improve his fitness performance through self-tracking, Tessa explains in one of our interviews how tracking with a wearable chest strap device helped to improve her running routine:

> In the four years I've been using the app, I've already improved my running speed significantly. But I'm also keeping track of my heart rate and other health factors, you know? And I can always monitor my running routine, you see. Because speed is not the only relevant factor, you have to consider the conditions of the running track, too… like, are there changes in altitude, elevation, ground condition, and so on. Therefore, I get a much better picture of what I'm actually doing, how I'm actually improving and how I can really get better.

The particular dynamic that emerges between the individual and the technological measuring can be understood in terms of a cybernetic logic as feedback-controlled systems (Haraway 1991: 164). Having emerged in the cold war era, cybernetics seem to continue shaping contemporary imaginaries of how technological and human entities interact through design. What is more, it continues shaping tech development practices: Data is established as a common language as medium of regulation between the technology and the body. For example, Tessa describes one situation: Running uphill, she *could sense* how she was running at the same speed, but when she took a look at her app, the data showed her she had "actually" become slower. Here, the distinct quality of the data becomes manifest: The measurements generated by the self-tracking technology Tessa makes use of act as "objectifying data" (Mol 2002: 63). The subjective sense of her being-in-the-world is subordinated to technologically-generated measurements of being-in-the-world. Self-tracking data, in this sense, act as "facts" about the body and the embodied being. In the practices I observed in my research, engaging with these technologically generated "facts" *does* something important in user practices—yet the doings evoked might not necessarily follow the script that is envisioned by tech developers and built into the design.

Self-tracking practices of "doing health" and processes of responsibilization

Sarah uses a smartwatch like Tom and regularly engages with the data generated through the recording of signals emitted by her body. However, the only data she makes meaningful for herself is the number of the steps she takes during a day:

> Technically, the watch tracks a lot more than the step count, there's an app where you can see all this data, your improvement over time and so on. But so far, I've not even opened the app, I turned off all notifications of the app on my phone. I just need to know the numbers of steps… and these I can easily see on the watch.

Sarah's self-tracking practice does not emerge with/in purposeful physical exercise per se, but rather shapes her moving-through-the-world in significant ways: In her day-to-day life, she engages with the step tracking data, as displayed on the smartwatch screen. Although she affirms that she regularly works out two to three times per week, the only technologically mediated measure relevant to her is the amount of physical movement in her everyday urban life:

> It is a fact that even the most intense training routines cannot make up for a lack of movement in your everyday life. So for example, if I see that I'm still far from my daily goal, maybe I'd walk home instead of taking the bus, or I'd make an extra detour around the block. But I won't let myself go crazy if I don't achieve my steps, either.

The number of steps she takes during a day becomes meaningful for Sarah's practice of doing health as actions that are understood in terms of "choices" within her everyday life, as deliberate decisions she needs to take anew every day through monitoring her performance on the watch. If self-tracking technologies are understood in terms of a script that provides specific instructions for actions, we can see here how a re-scripting of self-tracking is enabled at the technological interface: Sarah never opens the app, she does not care to *know* the data beyond the daily step count produced by her smartwatch. She also takes off the smartwatch at night, even if it could track her sleep cycles. For Tom, on the other hand, the information his smartwatch produces about the quality of the bodily recovery during sleep is important because of what it means for his performance during the daytime. He tells me he had to stop using the wearable at night at some point, however: Knowing his sleep was being tracked made him anxious about the data he was producing by just lying still and made him wake up all the time to check the app.

In contrast to narratives of technological domination and control, the self-tracking practices that emerge here are situated within particular local and temporal contexts as they all bring about different practices of doing health: Tessa uses self-track-

ing to monitor her running routines as doing health but does not use self-tracking devices throughout the day. Tom engages with the data from his smartwatch in multiple doings, from sleep to lifestyle to physical exercise. Sarah, in turn, uses only one specific aspect of self-tracking that becomes meaningful to her doing health. In my research, it has furthermore become apparent that self-tracking practices are not stable but shifting over time, and are not absolute either. Rather, they are caught up in ongoing processes of negotiation as individuals navigate self-tracking as what could in a Foucauldian sense be understood as "technologies of the self" (see for example Foucault 1997) that link "practices of political government to forms of self-government" (Lemke 2021: 105).

Turning now to practices of design, it is precisely the fragility and indeed the ephemerality of self-tracking in practice(s) that I found tech developers to rather lack a sense of. As already indicated above, self-tracking technology designers configure the user as dutifully engaging with the tracked data and adjusting behavior accordingly in an ongoing way. For them, the objective is both clear and implicit in its normativity: It is about navigating choices and actions in such a way that it fosters the imperative of becoming healthy and to engage in doings I describe as doing health.

Alberto, CEO of a start-up that develops a medical self-tracking technology for the management of body fluids, and in particular of water intake, explains to me:

> There are several reasons why some of our patients need to monitor their water supply—they either drink not enough or too much. Now, we wanted to invent a technology that allows them to do that outside the hospital, to continue to check their water intake, so that they do not have to be hospitalized once again. This way, serious complications and emergencies can be avoided, and, you know, the patients wouldn't have to come back to the hospital all the time to get their water levels back on track.

In this logic, relationalities between different entities emerge as continuous feedback loops (Orr 2006: 107–110) in which signals emitted by one entity are captured by the other and translated into data points, that are transmitted as feedback to the first entity, back again, and so on. Central to this notion is an assumed mechanism of automatic regulation that leads to increased stability of the system: Alberto implicitly expects the future patients of this body fluid management app to use the information to adjust their water intake accordingly in an ongoing way. Thus, the information provided by self-tracking technologies and the novel kind of knowledge that is produced is not neutral and *is* not per se. Rather, it mobilizes with/in a feedback system of constant adjustment of activities and behavior that is already scripted into the design. Alberto's imaginary patient is in a constant process of adjusting water in-

take as it is recorded by the technology to the desired percentage deemed "healthy" by fine-tuning her doings, i.e., her drinking habits.

In my research, I paid particular attention on how these objectives become scripted into the technological design as imperatives that in user practices will not control but nevertheless significantly shape the emergent doings of health. There is much to say about "the user" that becomes "inscripted" into technological design and its politics—about the implicit gendering, classing, racialization, but also about simple access to the necessary infrastructures (see for example Matthewman 2018: 34). Beyond that, Suchman (2007: 188) has criticized the ways in which individuals are identified exclusively within the relationality to the technology in question, which results in a singularization of the multiplicity of user identities. And indeed, the logic employed by the start-ups I conducted research with, follows such an understanding of the user identified through a problem that needs to be solved and can be managed by being captured within the feedback loop of self-tracking technology. In my conversations with the founder and CEO of a start-up that operates a lifestyle app, the ways in which the technological design implicitly configures not only "the user" but "health" as well became apparent. In the first interview with Norbert, he describes the app's approach as "gamification of health". On a white board, he starts by drawing a horizontal line and explains:

> Here on both ends, you see the extremes, so to say. Here are the unhealthiest, and on the other side the healthiest. These two groups on the outer sides have to be understood as separate groups—they need programs that are specialized for them. But those from the middle, you see, where we would locate actually the majority of people, they can still change their habits and become healthier, do *more* for their health.

What Norbert describes here is an important development in the way the notion of "health" shifts: Within processes of increasing commodification of health, subjects are configured as individuals in terms of consumers that need to navigate not only uncertain futures in terms of the individual at risk, but also the ontological uncertainty of its being in the present. Hence, individuals that previously would have been deemed "healthy" are now being recruited into practices of doing health via different tools of responsibilization, such as the self-tracking technology in question. The implicit imperative is to care for new kinds of knowledge, to engage with bodily data and to adapt and adjust doings to actively counteract the onset of disease and deterioration of the body—which reminds of Rose's (2007) notion of the "vital politics" of our time that are "concerned with our growing capacities to control, manage, engineer, reshape, and modulate the very vital capacities of human beings as living creatures" (2007: 3).

Yet, the imagined automatized regulatory mechanism at the interface of human and technology is not self-evident, but the product of both technological design as well as affective work done by individuals engaging with it: For an individual to look at self-tracked data certainly does not automatically result in an adaptation of doings. The ability to read and understand statistics and visualizations, to relate these to activities and sensed embodied doings, and to modify ongoing doings accordingly must be understood as a task that is indeed demanding and preconditional and in which affectivities and particular kinds of knowledge are mobilized into particular directions—that may or may not match with the configured use. However, self-tracking technologies need to be taken seriously as tools of responsibilization of the individual, and as producing particular practices of doing health—especially in view of current efforts to materialize an integration of self-tracking into health care policies.

Emerging regimes of "doing health" in insurance policy

The current efforts of health insurance companies in Germany to implement self-tracking technologies reflect an increasing inclination of policymakers to employ technological solutions, and most prominently, wearable devices, for healthcare challenges (Farrington and Lynch (2018: 4). These efforts must be interpreted within ongoing processes of commodification of health and responsibilization of the individual subject as means of biopolitical control: Self-tracking emerges as technological "fix" to "problems" that are presumedly linked to particular kinds of "lifestyle" in urban environments and increasingly sedentary routines, and that can be prevented by doing health in an ongoing way—thus building on a rather mechanical model of social life in a rather patronizing manner (Layne 2000: 493).

While in Austria the attempts to implement self-tracking data into health care seems to be in its early days at the most, developments are more advanced in the German context. Here, almost every health insurance provider is already running different kinds of so-called "bonus programs", which serve as feature of distinction and competition between health insurers on the market. These developments, however, seem to happen outside of political influence of the state as well as far from public discussion about how these processes might put into question the principle of solidarity and equal access to health insurance. With these programs, the insurant can receive a reward or compensation in turn for engaging in different activities, such as attending preventive check-ups. This approach to health care recruits individuals into doings of health that supposedly benefit the individual's quality of life—and at the same time and perhaps more importantly, it is discursively represented as a cost-saving measure from the point of view of health insurance companies.

Whereas the bonus programs were previously conducted through paper booklets, the implementation of self-tracking data is part of a shift towards digitalization

of these programs and health care in general. Nowadays, companies increasingly encourage the use of self-tracking, for example by offering to subsidize the acquisition of a self-tracking device. One of the start-ups I had contacted was developing a so-called "white label app" to be integrated into such bonus programs—referring to an app they develop and sell to health insurance companies so that these can brand and provide the app as their own. Back in 2019, Norbert not only told me they were in negotiation with diverse health insurance companies, and that just a few days before our interview, they had been able to finalize negotiations for one specific bonus program. He tells me:

> Ultimately, the goal for health insurance companies is to achieve the shift from a cost reimbursement provider to a health service provider. Not to just pay when the insurant gets sick. But as for today, there's a considerable lack of touchpoints between insurers and insurants—and especially between insurers and their healthy insurants. This is why we need to create what we call touchpoints between the insurer and the insurant. If not, we run the risk of losing the insurants, because nowadays, who hold these digital touchpoints already are Apple and Google Health and the like.

He argues that the growing reach of self-tracking technologies of both Apple and Google Health—both platforms that enable the collection of self-tracked data from different devices into one site—hold a monopole on health data of individuals on a global scale. This, according to Norbert, poses a significant risk and debilitates the position of health insurance companies even more. In order to "keep up" with these developments, he continues, German health insurance providers need to generate their own "touchpoints" to their insurants. Within this ongoing shift of the configuration of the individual—from citizen to consumer—health emerges as a product, and indeed, as *producible*. It would seem as if the notion of "health" that is mobilized here would become broader and more encompassing. However, self-tracking technologies through their design pre-scribe doings of health in very particular ways, so that it seems as if the actual modes of being healthy, and what being healthy means, are in fact narrowed down.

A crucial insight from my research on user and designer practices is that the discrepancy between user configurations produced by tech developers and actual doings of self-tracking in user practices does not come to matter: Take for example Sarah, who might not engage with the tracked data beyond her step count. The tracked data produced by her doings will be fed back into the tracking technology nonetheless, and will become interpreted as if she *was* following the script, so to say. As the data generated in self-tracking practices of users is fed back into the technological design, practices of design are caught up in their own preconfigured feedback loops. The information recorded in user practices cannot be analyzed outside of

the technological script, but instead always further reproduces the user configurations it entails; no matter how they are done and possibly re-scripted in practice. As these technological scripts enact a cybernetic logic, even "disobedient" doings, e.g., ignoring instructions, doing activities in the wrong way, or even "lying" by feeding the app with inaccurate data, are simply rendered data points fed back into the system. The "terms and conditions" of self-tracking, so to say, are already established by design and closed to any kind of critique or resistance from within, while the heterogeneous and fragmented nature of these technologies also avert public discussion and debate from the outside, as described before. However empowering they might be as individual strategies for navigating the increasing imperative of doing health, power is distributed rather unequally. That is not to position tech developers as "data-rich" actors holding power as opposed to users as "data-poor" actors in a homogenizing way, as Schüll and Ruckenstein (2007) have warned against. Indeed, designers themselves have to be understood as situated in a highly competitive and fragmented field of tech development, in which they navigate complex affordances in their respective niches. If power becomes bundled, however, into platforms on a larger scale, the risk is that engaging with self-tracking technologies becomes less a possibility for individuals to navigate their being-in-the-world, but an imperative with potentially (socio)material consequences.

Affectivities and uncertainties of self-tracking practices

In this final part, I will describe more in detail the affectivities mobilized in self-tracking practices as well as the uncertainties they emerge with, and ask how these become distributed across diverse practices, actors and bodies.

I have before shown the ways in which self-tracking technologies become powerful as they produce being with/in a linear temporality and notions of being-in-the-world as a task of ongoing development which becomes normatively charged in terms of "improvement". The doings of user practices produce a subject that is temporally tethered between the past that becomes enacted through data of past doings, and between the future that becomes discernible through the visualizations and statistics. The future is in constant doing, so to say—*becoming* with every new data point that is generated. This is a kind of future directionality that differs from an anticipatory mode, which in the Anthropocene has become a dominant mode of exerting control (see for example Adams et. al 2009): Here actions in the present are directed at predicted or envisioned problems in the future—not to prevent but to navigate them. In self-tracking doings of health, in contrast, "the future" does not as such emerge as point of reference in. The meaning of doing health is produced by actions carried out in the past that are recorded, analyzed and directed towards a possible future through adaptation and adjustment of subsequent actions in an ongoing manner.

Self-tracking technologies that provide predictions of specific kinds of risk such as the body fluid management app, evoke the future in terms of a statistical risk that needs to be navigated—and indeed becomes possible to be navigated—within self-tracking. Here, what is at stake is a specific health concern that comes with a measurable risk. Yet, in technologies that are directed more at evoking doing health as a more encompassing practice, there is no one specific health concern and therefore no specific risk that is being mobilized. What is at stake is the individual's health in the sense of a general wellbeing. If the future health of the individual in this logic is understood as the sum of actions and decisions, each moment in time is important as it produces a consolidation of the kind of health that is done. To engage in self-tracking, then, is to gain control over these ongoing doings, and to decide the directionality of the process of doing health such as Tom, Sarah and Tessa do. They engage with their self-tracked information about how to shape their doing health properly. While the past appears as already written—as data that is retrievable at any given moment—and not changeable anymore, the possibility for action is located in the very present. In this way, self-tracking technologies open up possibilities for adjusting these doings in order to produce health. In this way, potentialities that might be interpreted in terms of hope in a nonspecific, general sense emerge.

The body, in these practices, is rendered the site of concern, and simultaneously as site for doing health. The body itself, but more importantly habits and behavior patterns that are understood as inherently embodied are rendered malleable through measurement. The self-tracked body becomes a hybrid of recordings of bodily information and averages: The information captured by tracking technologies is interpreted, related and analyzed against established standard measures and norms, e.g., optimal water intake, normal heart rate, average of the body mass index (BMI). Uncertainties about the body, its processes and states, become possible to navigate with/in the feedback loops provided by self-tracking devices. On one occasion, Tessa describes how she "didn't have a feeling" for her own body before she started engaging in self-tracking practices. To be able to sense the body subjectively is not enough and indeed misleading, in this logic. In self-tracking, ongoing doings thus become "choices" and "decisions" that get recorded by the tracking device and subsequently fed back to the individual to reflect upon, which in a sense render productive this uncertainty.

Self-tracked data as new kind of knowledge about the body, and ontological uncertainty about the sense of the self as result of not-knowing emerge together with an uncertainty about control and determination of ongoing doings. While the technological recording of signals detected from being-in-the-world generates new knowledge as grounds for further doings, they come with new uncertainties that pertain the tracking itself: Tom, for example, explains to me that the tracking achieves only a very close approximation. He tells me the error rates of different self-tracking devices which he apparently knows by heart. When I ask what this

uncertainty about the accuracy does to his practices, he shrugs and says it is such a minimal inaccuracy, it does not matter. And indeed, beyond this single instance, I found that this technological uncertainty does not come to matter in self-tracking practices: The data produced by the self-tracking device is taken as "fact" as it mobilizes further doings. When Tessa, as described above, tells me how the data on the app made her "realize" she had become slower even if she felt she was running at the same speed, the data is enacted as "fact". In relation to the data-as-fact, uncertainty, here, is shifted to her embodied measurement, to her subjective sense of self—instead of causing her to question the accuracy of the information her app displays, for example. This observation is reinforced by statements such as "any training session that is not recorded is no training session", as Tessa explained to me. Only what is tracked by the app is certain and can become meaningful as "fact" about being-in-the-world.

Tech developers do not render meaningful the uncertainties of their technologies either but take the data as "facts" as well, even if they know about uncertainties. Not only do they know about the rate of inaccuracy of their technologies. They also know which standards and the norms they script into the design, and about the potentially uncertain nature of these averages that themselves are subject of modification according to new evidence. When I asked Norbert, the CEO of the lifestyle app, about the possibility to "trick" the app by feeding it with inaccurate information, he laughs and says:

> If someone can really be bothered by lying to the app by entering false information, then so be it. But, you know, you would be betraying yourself. So I can hardly imagine anyone doing this.

The uncertainty about the compliance of users is disregarded and explained away by resorting to the commitment-producing technological script—and becomes eliminated insofar as within the feedback loop, the tracked data is taken as "fact" in tech development processes of further refining and personalizing the technological design. Within this kind of previously described inbuilt automatic regulation, uncertainties become distributed in unequal ways and potentially override and overrule divergent ways of being, sensing, and measuring.

Affectivities of hope and normative understandings of health intersecting with new kinds of information provided by self-tracked data can be potentially empowering for the individual. The ongoing shift towards digitalization is also a shift of personalization of medicine and health care, in which self-tracked data as objectifying knowledge about the body, habits and behavior are becoming more important. This potentially renders the individual as their own "expert" vis à vis generalizing medical knowledge. However, not only is this potential expertise intrinsically produced by a technology scripted according to understandings and desires of tech developers

that are well beyond control and contestation by the individual user, but also do the current developments of integrating self-tracked data into health insurance policies indicate a shift in authority, expertise and ownership of the tracked information and data away from the individual. From the side of designers and stakeholders, the openness and malleability of the body is produced with a different kind of hope about the technological manageability of bodies and the health care they need. As already described above, this functional understanding of bodies and individuals as citizens, consumer and part of the labor force reinscribes responsibility for doing health into the subject. It is interesting to consider the fact that the particular notion of "health" emerging from the "problems" self-tracking technologies set out to tackle is increasingly narrow. It might seem a shift towards a more encompassing, holistic approach to health, but it appears that instead, more and more aspects of being-in-the-world become integrated, or "medicalized", in a sense, all the while the particular ways of how to be healthy are increasingly deterministic. An increasing integration of self-tracking technologies into health insurance and health care as outlined above, of course, could further this shift considerably and capture actors, bodies and doings within preconfigured and scripted feedback loops.

Yet another aspect of uncertainty pertains to the question of how exactly insurants as well as insurance companies can benefit from the implementation of these "bonus programs" and the integration of self-tracking technologies, insofar as there is no actual evidence for most of the activities that are promoted as doing health within these practices—or at least not yet. For example, a causal relation between the health of an individual and taking 10.000 steps per day could not yet proven (see Reynolds 2021). In practices of design, these objectives are established at some point, but might not actually correspond to medical insights or the most recent evidence. What is achieved through self-tracking technologies as tools of responsibilization, however, is a recruitment of individuals into doing health as something controllable and adjustable into any desired directions.

Conclusion

In this chapter, I presented ways of doing health in self-tracking practices emerging with/in processes of increasing urbanization and changing lifestyles, shifting landscapes and bodies leading to critical conditions for human being-in-the-world in late capitalism. Self-tracking as "technology of the self" makes productive the feedback loop of recording bodily information rendered into measurable units and reporting it back as "data" to the individual. I have proposed an understanding of self-tracking practices in their ephemerality that resists conceptualizing the identities of individuals identified as users as fixed, and their practices as coherent, cohesive, and stable. My empirical data has shown practices that are more or less established at the

moment of my research, yet emphasized the constant work they require—practices that now, five years later, most probably have shifted in some way or another, that might have become refined, suspended, or abandoned.

In reference to the empirical material, I have discussed the ways in which self-tracked data becomes mobilized into particular doings, and specifically into what I identify as ways of doing health that are directed towards navigating ontological uncertainties about the state and the future of the body and embodied being-in-the-world. Self-tracking technologies enable these doings insofar as they generate objectifying data that opens up possible lines for further doings. As they become powerful tools of responsibilization of individual subjects, an interrogation of the technological script is crucial—even more so in view of ongoing processes of integrating self-tracked data into health insurance companies. The understanding of health that becomes mobilized is shifting from a notion of health as property or state of being towards a more encompassing and indeed ongoing notion of health as doings intrinsically contextualized within linear temporalities. Within this shift and the possibilities enabled by self-tracking technologies to navigate doings of health, affectivities of hope emerge in an open-ended, nonspecific mode. Finally, I have argued that ontological uncertainties about the body and the embodied being-in-the-world, novel technologies and new kinds of knowledge emerge together. Through processes of technologization that are critical to contextualize with/in shifting notions of health, they are distributed in unequal ways across sites, actors, and bodies.

In my attempt to contextualize the ongoing developments in self-tracking technologies and the ways in which these emerging imperatives of doing health become mobilized, these processes can be interpreted in continuity with a logic of cybernetics and a functional understanding of bodies and populations, an increasing individualization, responsibilization and economization of health. It is also interesting to read these processes against new kinds of uncertainties that emerge in the Anthropocene—a growing sense of the porosity of bodies within social and ecological environments, and multiple kinds of evidence from microbiome science or epigenetics, for example, leading to a shifting understanding of human-environment relations in which boundaries between the human and the more-than-human are critically blurred (see for example Heitger et al. 2021). If self-tracking technologies and the re-inscription of choice of an assumed individual human subject are understood as project of (re-)establishing control of bodies and their life conditions in an intrinsically anthropogenic world, their future is more than uncertain.

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