

Appropriating Digital Traces of Self-Quantification: Contextualizing Pragmatic and Enthusiast Self-Trackers

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On the basis of a media ethnography of self-trackers and their self-quantification, we argue in this article that the ways related media technologies and digital traces are appropriated depends on the overall contexts of these self-trackers. There are at least three kinds of contexts that matter: first, the context of further practices, of which self-tracking and self-quantification are a part; second, the context of social figurations the self-trackers are involved in or related to; and, third, the context of societal discourses about the self in present societies. These contexts come together in two fundamental types of self-tracker, whom we call “pragmatists” and “enthusiasts.” These two types differ in the way they use digital traces for self-tracking and the meaning of self-tracking in their everyday lives. However, both types can be understood as an expression of a new form of constructing the self in times of deep mediatization.

Keywords: self-tracking, self-quantification, quantified self, datafication, digital traces

Self-tracking and self-quantification have become an everyday phenomenon. Only a few years ago, this set of practices was characteristic of a focused, dedicated group of people driven by the pioneering idea of the “quantified self.” The popularity of self-tracking devices such as activity trackers, smart watches, and smartphones with respective apps made self-tracking a widespread phenomenon in the West. As the use of these devices becomes more common, some users are well aware of the digital traces they produce. Others are far less aware of the footprints that are left online when they use such media technologies. In those cases, digital traces arise in an unintended way that is a side effect of the use of the devices.

In this article, we investigate this particular kind of usage of digital traces and its entanglement with further practices. We argue that the way the media technologies of self-tracking and the traces produced by them are appropriated depends on individuals’ overall contexts. There are at least three kinds of context that matter: first, the context of further practices, of which self-tracking and self-quantification are a part; second, the context of the social figurations the self-trackers are involved in or related to; and,

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third, the context of societal discourses about the self. Within these contexts, we can distinguish two fundamental kinds of self-trackers: "pragmatists" and "enthusiasts."

To substantiate our argument, we proceed in five steps. First, we discuss the challenge of putting digital traces, self-tracking, and self-quantification in context. Taking this as point of departure, we explain in detail the methodology we used for our empirical research: an explorative media ethnography on everyday self-tracking and self-quantification. Then we present our research results in two sections, first discussing digital traces and self-tracking as ambivalent self-formation, then focusing on pragmatic and enthusiast self-trackers and their orientation in practice. Finally, we conclude with a discussion of what can be learned from such an analysis about contextually understanding self-tracking and self-quantification as a characteristic form of constructing the self.

Putting Digital Traces of Self-Tracking and Self-Quantification in Context: Practices, Figurations, and Discourses

The digital traces of self-tracking and related processes of self-quantification are a very specific phenomenon. Whereas the particular traces left in the process of self-tracking might be created unaware, the *decision* to do self-tracking is made by individuals with a certain purpose in mind, usually to gain a better understanding of oneself—within whichever type that might be. With the spread of wearable technologies of self-measurement (e.g., fitness devices and smart watches) and their everyday appropriation (cf. Swan, 2013), self-tracking has become increasingly a research topic in social sciences (for an overview, see Lupton, 2016; Neff & Nafus, 2016). Existing research focuses on this phenomenon in at least two respects, but in both cases the context of self-tracking is mostly discussed only in an implicit way.

First, one line of research focuses on the individual and his or her practices of self-tracking. Here, the particular topic of interest differs, including, for example, the use of self-tracking for health reasons (Swan, 2012), sports (Williamson, 2015), or sexual activities (Lupton, 2015). In addition, research in the field of informatics and computer engineering focuses on the empirically based development of better technologies of self-quantification (e.g., Kranz et al., 2013). In such studies, self-tracking is typically defined as the individual's use of technology to record, monitor, and reflect upon features of daily life (French & Smith, 2013; Lupton, 2016, p. 2). This self-tracking is not necessarily quantitative because it can include various forms of life-logging which may not be based on the use of digital technologies (cf. Selke, 2016). However, in its present form based on the use of digital devices, self-tracking often involves self-quantification: gaining insights about oneself by producing statistical data, typically via digital traces of one's own behavior and subsequent software-based analysis by means of apps and online platforms. Research in this area increasingly emphasizes the need to not only understand such practices of self-tracking as individual phenomena related to individual needs but to contextualize such activities—for example, in further social forms of "self-control" (Reigeluth, 2014, pp. 250–252) or "tracking cultures" (Lupton, 2016, pp. 64–87).

Second, another line of research focuses on specific communities of self-tracking. Referring to a more general discussion about "communities of practice" (Wenger, 1999), we can define self-tracking communities as "sets of relationships in which people discuss data, whether loose or tight-knit, and

whether located at the same place or not" (Neff & Nafus, 2016, p. 29). The most prominent community here is the quantified self movement, a "pioneer community" (Hepp, 2016, p. 924) founded by *Wired* editors Gary Wolf and Kevin Kelly in 2008 (Boesel, 2013; Nafus & Sherman, 2014). As a mixture of social movement and think tank, the quantified self movement built a network of conferences and local meet-ups via organized groups mainly in North America and Europe in which an organizational elite comes together with enthusiasts and developers and tries to establish future possibilities of self-tracking and datafication. The context here is the pioneer community and the various related local groups as communities of practice.

Across such different studies, the idea of context matters: All the studies share the argument that it only becomes possible to understand the use of the digital traces as part of self-tracking and self-quantification when they are somehow contextualized. However, this contextualization mainly takes place in an implicit way, in parallel to the more general use of the term *context* in media and communication research. Context, then, means the "physical, social-psychological, and temporal environment in which communication takes place and exerts influence on the form and content of communication" (Devito, 1986, p. 79).

From a media sociological point of view, it might help to be more sensitive when analyzing the context of self-tracking, self-quantification, and related digital traces. This has something to do with the imaginations of context on the part of the actors participating in this field, who tend to construct practices of self-tracking and self-quantification as being somehow context-free. This is especially typical for the discourse within pioneer communities. There are two extremes of this, both relating to each other. On the one side of the extreme is the imagination of self-tracking and self-quantification as an "N=1 experiment." Kevin Kelly (2016), for example, argues that self-tracking would be purely about the individual as a unique subject as any "quantified self-experiment . . . is just N=1" (p. 241). For Kelly, this is the special potential of related practices:

The subject is yourself. At first it may seem that an N=1 experiment is not scientifically valid, but it turns out that it is extremely valid to *you*. In many ways it is the ideal experiment because you are testing the variable X against the very particular subject that is your body and mind at one point in time. Who cares whether the treatment works for anyone else? What you want to know is, how does it affect *me*? An N=1 provides that laser-focused result. (p. 241, emphasis in original)

In this view, it is not the individual as a social being that is the focus but rather an individual who is somehow imagined as "atomistic" and "separated," able to "experiment" with the self in a very independent way.

At the other extreme are imaginations of self-measurement as part of the collection of "big data" (Mayer-Schönberger & Cukier, 2013, p. 94). The idea here is that if a high number of individuals were to do self-tracking, then a huge amount of data on almost every area could be collected and made accessible to support a better society for all. *Wired* editor Chris Anderson (2008) called this the "end of theory," which would become possible as soon as a large amount of aggregated digital data would allow not only

an automated analysis of social phenomena but the forecast of future individual behavior.¹ This relates to the idea of N=1 in that it is about the automatized aggregation of related digital traces—or, as Dana Greenfield (2016) has put it: the “n-of-a-billion-1s” (p. 130).

At this point, it is useful to remember the more general discussion surrounding contextual analysis in social sciences. In his well-known article on social theory and empirical research, James Coleman (1986) complained about the “growth of individualistic behaviourism” (p. 1313), which accumulates statistical survey data on the individual to make general statements about society. However, such a move results in the loss of any context for explanation. In contrast, the original strength of early survey studies—including those of media and communication research (e.g., Katz & Lazarsfeld, 1955)—was to undertake such surveys as part of research on defined communities, offering the chance to integrate related contextual information into the interpretation of survey data. Both the focus on the individual as N=1 as well as the idea of making more general assessments by an aggregation of individual data risk facing the same issues criticized in writings on the problems of aggregating individual survey data for social explanation—survey data, which is nowadays problematized by pioneers of self-tracking and self-quantification while blundering into the same trap. In very different ways, self-experiments (the idea of N=1) and the aggregation of big data (the idea of n-of-a-billion-1s) reproduce the problem of an analysis that undermines the social context.

In light of this discussion, it is worth remembering the original idea of contextual analysis in social sciences. Across the spectrum of its different approaches (cf., e.g., Ang, 1996, pp. 66–81; Esser, 1999, pp. 426–434, for very different arguments), the core idea of doing contextual analysis is to center research neither on the individual and the aggregation of individual data nor on the totality of abstract systems but rather on a meso level: the various social domains of everyday life in which individuals are involved through their practices and interrelations. The argument for this level of analysis is that, here, individual practices can be analyzed in characteristic situations of performance, the various constellations of actors who matter are accessible, and the influences of further structuring forces can be taken into account. This way of thinking is also reflected in more detailed understandings of context in media and communication research—for example, when John Hartley (2011) defines the “context of communication” (p. 61) with respect to the social situatedness of a communicative event, its spatiotemporal location, and the further discursive surroundings.

On the basis of such arguments and with reference to our own empirical research presented in this article, it is appropriate to distinguish between at least three possible contexts that matter for analyzing self-tracking, self-quantification, and the related digital traces: practices, figurations, and discourses.

¹ Such an idea of big data has been criticized in media and communication research (cf. especially boyd & Crawford, 2012; Elmer, Langlois, & Redden, 2015; Lohmeier, 2014).

Practices

Despite the fact that digital traces are understood as sequences of digital footprints originating from a certain human behavior, when it comes to self-tracking, we cannot understand them beyond the further practices of which they are a part. As noted in the research discussed above, the digital traces originating from self-tracking are articulated as part of more far-reaching practices such as, for example, participating in a certain sport or keeping a certain diet. From this point of view, self-tracking is a *media and communication practice* that is embedded in more complex forms of practice, which build their further context. Self-tracking is a *media practice* as it is related to media and their infrastructures (Couldry, 2012, p. 43): the digital devices, apps, and digital platforms that are used to measure behavior by producing various forms of digital traces, which then can be analyzed. And self-tracking is a *communication practice* as it is a threefold communication: “with the system, the self and social networks” (Lomborg & Frandsen, 2015, p. 1025). Self-tracking is a virtualized communication with the software system because the digital traces being produced and analyzed are presented to the individual in the form of single communication acts with a kind of “data double” (Haggerty & Ericson, 2000, p. 606). It is a communication with the self because these systems offer the chance for self-communication concerning one’s own practices. And it is, finally, communication with and in social networks because it is the basis of reciprocal communication with others on the tracked data, related practices, and one’s own reflection on these.

Self-tracking and self-quantification typically do not have an end or value in themselves. Rather, they are embedded in more complex forms of practice—participating in a sport, controlling weight, sleeping well, and so on—that are performed in typical situations and at characteristic locations which altogether build a first meaningful context of practice.

Figurations

While self-tracking seems to be related to the self, it is obvious that the individual cannot exist beyond social relations. Following Norbert Elias (1978), we can understand the individual as fundamentally involved in and dependent on figurations with others—mainly collectivities (groups, communities, etc.) and organizations (companies, associations, etc.; Couldry & Hepp, 2017, pp. 66–67). A typical example of this are the communities of practice where self-tracking takes place. Other examples are relationships to friends and family members with whom self-tracking and self-quantification are discussed. Such figurations have a certain constellation of actors as part of them (i.e., the members of a community or company); certain relevance frames by which the involved actors share an orientation as being part of this figuration; and certain practices that are characteristic for this figuration, which in times of deep mediatization are typically entangled with a media ensemble. Such figurations are a further context for self-tracking and their digital traces of self-quantification in various senses. We have seen that there are characteristic communities of practice when it comes to self-tracking—in particular, the pioneer community of the quantified self movement. For self-trackers who define themselves as being part of this pioneer community, it is an important context for their own self-tracking and self-quantification. But for (most) self-trackers who are more distant from this pioneer community, other figurations matter as important contexts of their own self-tracking: partnerships, sports groups, circles of friends, fitness and health clubs, and so on. They can be a community of practice, but they are not necessarily such.

Discourses

To understand self-tracking, self-quantification, and the related digital traces, it is important that they are contextualized in further societal discourses. At this point, it is worth referring again to the quantified self movement and, specifically, to Gary Wolf as one of its key representatives. Being aware of the tensions and potential strangeness of the idea that "self-knowledge [comes] through numbers" (Wolf, 2009), in apparent support of this proposition, he provides some key arguments that implicitly refer to further societal discourses about the self. For example, the idea that "our ordinary behaviour contains obscure quantitative signals that can be used to inform our behaviour, once we learn to read them" (Wolf, 2010, p. 4) of course builds on the practical starting point that "social media made it seem *normal* to share everything" (Wolf, 2010, para. 16, added emphasis). The process is self-fueling: "The more [people] want to share, the more they want to have something to share" (Wolf, 2010, para. 25). This is an explicitly collaborative form of mediated construction that, as it grows in regularity and intensity, produces alongside each concrete individual a "data double" (Haggerty & Ericson, 2000; Ruckenstein, 2014), which—from certain perspectives such as those of the quantified self movement but also perhaps some contemporary governments (Ruppert, 2011)—contains more "truth" than an individual's own self-reflections. We are witnessing here certain discourses in relation to the fundamental languages for describing and measuring the self. The case of self-quantification in the health domain is particularly illuminating. More and more people are using tracking devices to generate continuous data about themselves (e.g., heart rate and metabolic rate). As Deborah Lupton (2016) points out, this is more than just another "technology of the self" (Foucault, 1988); it is a way of embedding the self, and its "data practices," in a much wider infrastructure of data generation, aggregation, and analysis, which could potentially transform the distribution of resources in the health industries away from cure and toward continuous activities of prevention. We notice at this point a shift in public discourse about health and about datafication in general.

In sum, putting digital traces of self-tracking and self-quantification in context involves keeping at least three areas of contextualization in mind: first, the context of further practices in which the self-tracking is embedded (including the locations and situations where self-tracking and self-quantification are performed); second, the context of various figurations which self-trackers are involved in and relate to (various collectivities and organizations that matter here); and, third, the context of societal discourses on the self, including health, beauty, and datafication. These discourses are supported by certain governing institutions (e.g., the health industry and government bodies), therefore creating a further institutional moment of this context.

When it comes to empirical research, it is important to bear in mind that these three areas of context are closely interrelated: The practices that build the context of self-tracking rely on certain figurations, because many individuals do not do self-tracking just for themselves but as part of certain groups or relationships in which the various discourses about the self become appropriated. In this sense, such an analytical distinction can only be the starting point for empirical research.

Analyzing Self-Tracking and Self-Quantification: Media Ethnography as a Method

Our analysis is based on a media ethnography using qualitative interviews and observations undertaken in 2015 in a city in northern Germany. Our research focused not on members of the quantified self movement in the strict sense of the term but rather on everyday users of self-quantification technologies. The idea was to gain a better understanding of people's appropriation of these technologies, the self-tracking and self-quantification, its contextualization, and how this relates to reflexive processes of constructing the self.

The sample consists of four women and two men between ages 24 and 37 and having different professions (see Table 1 for an overview). All interviewees responded to an online advertisement seeking people who are prepared to be interviewed about their self-tracking. Referring back to the idea of theoretical sampling in grounded theory (Glaser & Strauss, 1999, pp. 45–77), the basic criteria for selecting participants were the variety of the self-tracking purposes and the self-tracking repertoire. The self-tracking repertoire designates the whole set of devices, apps, and platforms being used for self-tracking. All the participants used various devices and apps, partly embedded with further (social network) platforms. Therefore, the self-tracking repertoire comprises the subset of the individuals' whole "media repertoire" (Hasebrink & Domeyer, 2012, p. 759) that is used as part of the self-tracking. The idea was not to interview a large number of users but rather to focus the research on a limited number of self-trackers and thus gain a deeper insight into the contexts of self-tracking and self-quantification.

The interviews were transcribed and afterwards—together with field notes—software-based coded, first in an open process of finding appropriate concepts to describe the data (open coding) and later in more focused procedures (selective and axial coding) (Corbin & Strauss, 2008, pp. 220–310). Important categories were the *motives* for becoming involved in self-tracking and self-quantification, the different kinds of related *practices*, and, finally, the *attitude* toward the related technologies. The various contexts offered important explanations across these categories.

The analysis provided an opportunity to investigate digital traces in a highly contextualized way: During the interviews, the participants showed and therefore made accessible to us the kinds of traces they produced. The core point among interviewees was that they collected this data owing to certain motives and as part of specific practices. This information makes it possible to gain a certain understanding of the everyday meanings of these *consciously produced* traces. One main result of our research is that the construction of the everyday meaning of such digital traces depends on whether a self-tracker is more of a pragmatist or more of an enthusiast. Across these two basic types of self-trackers, the ambivalent self-formation is a general characteristic of self-quantification.

Table 1. Sample.

Name ^a	Age	Gender	Profession	Purpose of self-tracking	Areas of self-tracking	Self-tracking repertoire
Babette	37	Female	Dispatcher in a wine trading company	Controlling weight	Weight (diet and exercise)	Smartphone, tracking apps
Clara	24	Female	Student	Handling narcolepsy	Sleep, weight	Smartphone, tracking apps
Jan	31	Male	Export trader	Supporting a sportive lifestyle, finding balance	Sport, diet, motion	Smartphone, tracking apps, social software
Lennart	26	Male	Student	Supporting a sportive lifestyle, improving performance	Sport, sleep, motion	Smartphone, smart watch, shoe sensor, alarm clock, ergometer, tracking apps
Nadine	32	Female	Former nurse, now social worker	Supporting a sportive lifestyle, remaining active	Sport, diet, heart activity, motion	Smartphone, smart watch, tracking apps, social software
Susanne	28	Female	Designer	Handling weight, remaining active	Weight (diet and exercise)	Smartphone, tracking apps

^a All names are pseudonyms.

Ambivalent Self-Formation: Digital Traces and Self-Tracking

As shown in Table 1, the purposes of self-tracking vary significantly among the participants. But despite the differences, one main purpose links them: All the interviewees use self-tracking with the idea of formation of the self. They share the hope that intensive self-tracking will help them to “form” their selves in a “better” way, where *better* can mean various things: more healthy, more beautiful, or more productive. They put digital traces in the context of societal discourses about the self, health, and beauty and interpret them as footprints of either “preferable” or “rejectable” behavior. The main value these technologies represents for them is to support an engagement in forming the self in a certain way.

For the 24-year-old student Clara, for example, the main motive for practicing self-tracking is to handle her narcolepsy. In addition to coping with the illness, she wants to form herself to act *productively* despite having this illness. Self-tracking helps Clara to “go into bed and to get up fairly regularly,” as she said in the interview. But it also helps her “structure” her day—something she has problems with: Handling her sleep rhythm is part of an overall engagement in handling the other rhythms of the day and its periods of work and leisure.

The purpose of Nadine's and Susanne's self-tracking is to keep active in a job that largely involves sitting. Nadine has a smart watch that reminds her to walk 10,000 steps a day. Susanne uses apps on her smartphone to motivate herself to go to work by bike instead of going by car. In her own words, the "bonus reward" of her smartphone app is that it reminds her if she is "lazy in the morning." Jan and Lennart use self-tracking for similar reasons: They both track in order to have more information about their sport activities and physical motion throughout the day.

Such an ongoing formation of the self is not necessarily about keeping the body healthy. It is more about balancing the self. Jan, for example, goes to parties, which are an excess he appreciates, but afterward the self-quantification of his calories and his weight help him to regain balance. For Babette and Clara, the use of nutritional apps is an ongoing monitoring of their desires and therefore a help to "discipline" themselves.

These examples demonstrate a "circle of self-formation" of which the self-tracking is part: Based on societal discourses of produced media such as (online) television, magazines, or advertisements as well as information in the technology of tracking apps, all the participants in our study have a certain understanding of what they "should" look like or how they "should" conduct their life. These notions sometimes clash with their routines that are closely related to the conditions of their lives, such as their work environment or other practicalities. Using various devices to produce digital traces of their routine actions makes it possible for them to make such routines and practicalities of everyday life tangible and thus handle them as something they can reflect on, address, and at least partly change.

At its core, the circle of self-formation is a sequence of certain discursively contextualized practices that are deeply entangled with the respective tracking repertoire: First, through continuous self-tracking, the apps offer *feedback* on one's routine everyday practices and their possible side effects (e.g., being less healthy because of being lazy at certain times or gaining weight by casual nibbling). The related datafication of this information offers, second, an *orientation* on the accumulation of various forms of behavior, which can be compared with the supposed expectations mediated by societal discourses of the self. Third, self-tracking then can be the basis for *controlling* and *improving* one's behaviors. Jan describes this quantified circle of formation of the self as follows:

One becomes aware: Fuck, such a chocolate sweet has about fifty calories. And before that [self-measurement technologies], one was sitting in front of the TV, digging in a whole bag without thinking. But if you know now, boy, for one of these chocolate sweets I must go jogging for this or that time, then you stop and eat nothing. Therefore, this is real, I don't know, one gets bad feelings if one turns to the crisps und calculates this nearly in kilometers . . . and says: The last run was this or that calories, and if I eat away all the chips now, then it was a waste of time; therefore, you can motivate yourself by this.

This quote illustrates why the circle of self-formation is *highly ambivalent*: On one level, it seems to be a new form of agency that the self-trackers gain via their self-quantification technologies. Collecting the various digital traces makes it possible for them to achieve a new, reflexive understanding of

themselves, their routine activities, and their practicability. This can be emancipatory as new possibilities of practices emerge. But on a second level, the values of this self-formation refer back to dominant discourses that converge in a construction of the self that acts functionally within society. At this point, the awareness of our interviewees is much more limited. Is self-tracking more about the use of digital traces for formatting a conformist self? Before we can answer this question, it is useful to closely examine the two basic types of self-trackers we found in our data: pragmatists and enthusiasts.

Orientation in Practice: Pragmatic and Enthusiast Self-Trackers

With our data, the notion of "orientation in practice" is important to understand contextualized self-tracking and self-quantification as well as the individual use of digital traces. As orientation in practice, we understand the overall embedding of self-tracking in the individuals' everyday practices, including the needs and purposes they connect with them. In our data, we can distinguish two fundamental orientations in practice: being oriented to the achievement of a certain purpose of self-quantification (pragmatists) or being oriented to its overall excitement (enthusiasts). In both cases, such orientations are not just individual phenomena; they relate to the figurations our interview partners are involved in when it comes to self-tracking and self-quantification.

Among our interviewees, Babette, Clara, and Susanne are pragmatists. They use self-tracking for different purposes, though: For Babette and Susanne, the purpose is weight control; for Clara, the purpose is to manage narcolepsy. Across such differences, these pragmatists share a distanced, rather instrumentalist relation to self-tracking. They are goal-oriented and have little enthusiasm or pleasure for tracking. For them, self-tracking is a means to an end. As a consequence, self-tracking refers only to its respective purpose, and the (imagined) end of self-tracking is the achievement of this purpose. The pragmatists are rather ordinary in their lifestyle in the sense that they have no extreme orientation to health or fitness. One is a dispatcher in a wine trading company (Babette), another is a student (Clara), and another works in the field of graphic design (Susanne). Their tracking repertoire is limited, consisting of a smartphone and one or two apps dedicated to the direct purpose of their tracking.

Babette, for example, works, in addition to her regular job, as bartender in a pub, smokes, and was drinking "quite regularly beer" before she started self-tracking. The only reason for her tracking is weight control. Therefore, she uses the app MyFitnessPal to track "what I am eating and how I handle the calories I take or how I lose weight." Since she began self-tracking, she has limited her consumption of alcohol to "clear spirit" with fewer calories. She started self-tracking when her former diet failed. She changed her drinking habits not because of the possible health consequences of alcohol consumption but because of the calories contained in the drinks. She also started to exercise—again, not out of enthusiasm but to lose weight. The app helps her to gain control by linking traces of her eating, drinking, and exercise with her weight. For her it is about achieving certain aesthetic norms with respect to her body.

Susanne is also a smoker. She started self-tracking after summer holidays in which her "kilos went up." Susanne was looking for a way to handle her weight and came to the conclusion that diet alone is not enough; in addition, she started jogging for exercise. She tracks both diet (by using MyFitnessPal) and exercise (with Runtastic), making it possible for her to link the traces of both. Jogging is for her

"something very practical." She does not have a "sense of pleasure" when running. It is all about achieving her dream weight and body.

Clara has some experience with diet apps, but her self-tracking is focused on sleep. She calls herself a "night owl" because she loves to stay awake until late at night, which conflicts with her own idea of a healthy lifestyle. The main difference between Clara's self-tracking and Babette's and Susanne's self-tracking is the medical reason for Clara's self-tracking: She is a diagnosed narcoleptic with serious sleep disturbances. She wants to gain control over this condition through detailed sleep monitoring using a sleep tracking app. As she puts it: "For me it is only about getting an overview, if I have a regular sleep pattern." Partly related to her illness, Clara has problems with self-organization and structuring the day. She tracks her sleep to gain control of her problems, to avoid the "illness [that] defines my life; that I am the one who decides."

The practices of the pragmatists are self-centered. In contrast to the enthusiasts, for whom the exchange of data and experiences is a constitutive part of their self-tracking and self-quantification, pragmatists rarely address the topic of self-quantification when talking to people; sometimes they even actively avoid it. Babette, for example, does not use her nutrition app when she is with other people because, as she says: "I don't want it to be a global topic." Her concern is that people adopt a critical attitude toward her self-tracking. Similarly, Susanne tries to avoid any communication about her diet-related self-tracking, since her colleagues started to make fun of her for doing it. For Susanne, it is a private topic that she solely shares with her boyfriend, who is an enthusiastic self-tracker. Clara is less reluctant to talk about the tracking of her sleep; but also for her, tracking is not a relevant topic when she is talking to people. She believes that "it's not very exciting for others to talk about it." All three pragmatics share a lack of interest in using online social networks to communicate about their self-tracking. As Clara describes it: "No idea, what other people are doing there. If I am doing it, I do it just for myself."

Self-tracking practices are not part of the social figurations of the pragmatists. However, the goals that they try to reach through self-tracking are deeply embedded in their social contexts. With their friends and partners, they share the aspiration to actively shape their bodies and conduct according to certain ideals of beauty and productivity, and their aspirations correspond with the expectations of health professionals and educational institutions. Referring to sociology, the self-tracking of pragmatists is driven by a "motivational relevance" (Schütz & Luckmann, 1973, p. 208) to achieve something that is contextualized in the figurations these self-trackers are involved in. They started self-tracking not because they understand this as a relevant practice in itself but rather because self-tracking becomes incorporated into other kinds of practices of importance: controlling weight and keeping sleep and work routines. All these practices are self-oriented as they address the optimization of one's own body and behavior and certain societal norms. For the pragmatists, self-tracking apps are a manifestation of such societal norms as they "materialize" respective expectations in an authoritative way. The app counts, blames, and prohibits—in effect, constructing a guilty conscience. As Babette puts it: "The app tells you, 'If you continue eating this way, your weight in five weeks is this and that.'" Or as Clara says, the app "kicks you in the ass." These pragmatists decide to do self-tracking to build up an external representation of their own behavior, which makes it possible for them to construct an authoritative pressure.

At this point, there is a parallel to the *enthusiasts*. They also understand the technologies of self-tracking as means of constructing a kind of external authority and, with this authority, gaining control over their own behavior. But for them self-tracking is not a necessary evil as part of further practices; rather, it relates to various other kinds of practices, such as adopting a healthy lifestyle.

Three of the people in our sample are enthusiasts, all of them passionate athletes: the student Lennart, the social worker and former nurse Nadine, and the export trader, Jan. Their tracking repertoire is much more comprehensive than that of the pragmatists. Besides apps, their repertoire includes various devices (smartphones, smart watches, shoe sensors, and other devices), software for data analysis, and digital platforms for related communications. Sports and a healthy lifestyle are connected to the enthusiasts' identity, and related practices are an integrative part of their daily routines. Enjoying sports is an important part of their life that is closely related to health and self-care.

Lennart, for example, describes his daily sports routine as follows: "When I get home at around four, half past four, I first sit on the ergometer and swing for three quarters of an hour." During the weekend when he has more time, he intensifies his sporting activity by outdoor cycling. This intensive bike training is partly for fun and partly to exercise his reduced kneecap. For Nadine, the daily routine starts with a "thought-out breakfast" followed by sport: "jogging, cycling or aerobics or strength training." Doing sport for her is "just fun." And Jan integrates running and football training in his daily routines.

For all three enthusiasts, the reason for their self-tracking is to support their lifestyle. Their tracking is not solely self-centered; it is also part of the figurations of others who share such an orientation. In Jan's case, in addition to his personal interest in self-tracking, it is an obligatory practice in his football team, which can be considered a community of practice. He also shares his jogging data on Facebook—for example, with a friend with whom he was training for a marathon at the time of the interview. Nadine shares her self-tracking activities and data as well as her overall "lifestyle" with all her friends, "who somehow at the moment all are very much like you can track this, you can do that." As a computer scientist, Lennart is interested in the technological aspects of the self-tracking trend, which he discusses with friends and colleagues. And he convinced his mother to start tracking her steps, advising her on the tools available. In such sports groups and communities of practice, an exchange on digital traces of sporting and other activities is widespread. But as our results reveal, also in other realms, such as the family and among friends and colleagues, such exchange plays an important role for enthusiastic self-trackers. Nadine describes intensive phases of training when she received via Facebook Runtastic information on the trainings of her friends. And Jan explains that because of smartphone apps, fitness training for his football club became easily possible at different places: "The trainer announces, 'Okay, go running in [your city], but please send me the Runtastic app screen shots.'"

These examples highlight the fact that tracking in the sense of collecting, writing down, and comparing the results has long been an integrative part of the practices of competitive sport and related figurations. Using the digital traces of sports activities is not something completely new; rather, it is a delegation of former noting and calculating activities to software-based systems. There is an unproblematic fit between older and newer elements of practice here that serves as a corrective to the novelty associated with the tracking devices. This is partly the reason why our interviewed enthusiasts find

self-tracking “unproblematic” and a “natural part” of doing sports and conducting a healthy lifestyle. They are used to training to increase their performance and, in so doing, comparing the results to their former performance and that of others. The technology of self-tracking makes this possible in an automated way and hence more easily, with new flexibilities and more detailed data. This explains why the enthusiasts become much more interested in the technologies of tracking and in the entanglement of these technologies with their own sport practices and lifestyle. A quote from Lennart is of interest at this point:

It started with running, then, because I got an iPod Touch and this is like smartphone without telephone. And I could connect this with some Nike stuff. And as I had the matching shoes I started to track just for fun. And then I continued with this principle. And for cycling I came in touch with Runtastic and I started to track also this. It wasn't that I wanted to keep track of something special, just simply tracking.

This quote demonstrates the main difference between pragmatists and enthusiasts: For pragmatists, the use of tracking has one clear purpose: what they want to achieve, and groups, communities, and other figurations of people are less important for self-tracking. For enthusiasts, it is more about a general activity of tracking. This has some purposes for training (gaining a better understanding of one's own improvement and having more control), but it has a value beyond this: having a digital materialization of one's activities, which is an integrative part of a healthy lifestyle. Such a lifestyle becomes stabilized by the involvement in various figurations of others who share the same orientation.

Because of this added value of self-tracking, enthusiasts see the use of tracking technologies to be much more playful. Lennart, for example, buys new technologies like a smart watch “just to try it,” to get a feeling for what the technology “has to offer.” In the same way, Nadine is inspired by the possibilities of these technologies:

It's fun. It is really crazy, and somehow I think the present zeitgeist today, this new smartphone can even check pulse at the backside, like this. I think, well, it seems to me now, and this just starts, all these fitness wristbands are only the first generation. I think by the end of this year there will be mega things on the market. And somehow I am looking forward to . . . I am just infected by this lifestyle.

Jan expressed a similar sentiment. Doing sport “is just fun” for him. As part of this lifestyle, he has a general interest in statistics, which resonates with self-tracking. He explains: “I am a great fan of statistics and this [digital traces] is very interesting for that. Especially Runtastic. You have this comparison, the last year I did run this and that, this year already this and that more.”

For enthusiasts, self-tracking is not about buying the technology for a limited purpose. It is more about making the technology part of their lifestyle, as an expression of it. In appropriating these technologies, the enthusiasts develop various uses for them. They are curious about datafication as a new part of their lifestyle.

Conclusion: Constructing a Datafied Self in Times of Deep Mediatization

Our analysis demonstrates two general patterns of putting digital traces into the context of the everyday. On the one hand are pragmatists, for whom self-tracking is part of purposeful practices such as weight control or keeping sleep and work routines. They have a limited tracking repertoire, and the use of these technologies is a necessary evil to achieve a certain aim. On the other hand are the enthusiasts, for whom self-tracking is part of a healthy lifestyle and incorporated in various sport practices. Self-tracking for them is fun; it is enjoyable and has a value in itself because it materializes their own activity via digital traces. Pragmatists and enthusiasts differ in the ways they contextualize their self-tracking and self-quantification: first, with regard to the practices in which self-tracking and self-quantification are embedded and, second, with regard to the further figurations of people involved. Across these two types, self-tracking is about having better control of the self by creating an external authority that is rooted in the accumulation and software-based analysis of one's digital traces. This makes an *ambivalent self-formation* possible, which is based on the circle of feedback loops, an orientation on such a basis, and by this the possibility to control and improve one's behaviors. We see here a further context at work: the context of societal discourses about the self, health, and beauty.

Our analysis is, first of all, a reconstruction of users' everyday practices and their various contexts. However, the important question is, How can we relate this to the more general question concerning the construction of the self? Referring back to our theoretical reflections earlier in this article, there are two points we want to highlight here: the emerging naturalness of self-quantification technologies and the implicit adaptation of societal models of the self under the guise of control.

We can see the emerging naturalness of self-quantification technologies for both pragmatists and enthusiasts, albeit in a different way. For the pragmatists, it is self-evident that self-tracking is an adequate tool to achieve the purposes they have in mind. So while they remain distanced from and somewhat skeptical about self-tracking, self-quantification is unproblematic to them because it is obviously helpful for them to make use of such technologies to achieve certain aims. And while they have a certain perception that they produce data that are used by companies for various purposes, they accept this as a side effect of their practices. This is even more the case for the enthusiasts, who integrate these technologies in a comprehensive way into their lifestyle. We can interpret both views as an expression of an ongoing process in which self-quantification becomes a more general part of conducting life. These technologies begin to lose their "strange" and "extraordinary" character.

Even more striking is the implicit adaptation of societal models of the self under the guise of control. According to our interviewees, the use of self-tracking is primarily about exercising control over self-formation. As stated in their interviews, *they* use the technologies to achieve *their* aims, to collect *their* sports activities, and so on. While this is at first glance correct, it becomes more complicated when we examine the character of this self-formation. It is striking that this self-formation mainly addresses *social expectations* of certain concepts of beauty, of body appearance, of functioning in work and private life, or of having a healthy lifestyle. In Western societies, such social expectations dominate within public discourses. And such categories directly refer to the software tools and the way they are appropriated by our participants: to the ways in which norms of weight are inscribed as expected sums of calories into the

software, to the ways in which activity is defined as a level to achieve, to the ways in which hours and phases of sleep are measured, and to the ways in which all this is implemented with ongoing feedback to improve oneself. Therefore, self-tracking becomes an instrument to personally achieve a better fit with such discourses.

This point of view brings an important argument into the discussion surrounding digital traces and self-quantification. As explained earlier in this article, one dominant perspective of the quantified self movement as a pioneer community is that any “quantified self-experiment . . . is just N=1” (Kelly, 2016, p. 241). Self-datafication would be about the individual as an independent, stand-alone subject. Generalizing this imagination to the level of society, this is then the accumulation of “n-of-a-billion-1s” (Greenfield, 2016, p. 130). Accumulated data would offer a direct access to society—beyond theory, so the imagination goes. Here, our empirical data demonstrate that these imaginations just reproduce the idea of everyday users about exercising control over self-formation by self-tracking and self-quantification. In contrast, we could demonstrate that even the “N=1” remains socially embedded, and individuals’ use of apps and devices reproduces to a certain degree social norms and expectations that are an issue of much more far-reaching discourses. Self-quantification is less about the individual as a single subject and more about new ways in which the self becomes constructed as a *social* self in times of deep mediatization.

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