CHAPTER 4

Accounting for Who We Are and Could Be: Inventing Taxonomies of the Self in an Age of Uncertainty

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Over the last decades, we have witnessed a further advance in quantification. In particular, the rise and spread of digital self-quantification, indicates new taxonomies of the self which (re)frame the human body, everyday practices, emotions and desires. During earlier waves of quantification, particularly from the nineteenth century onwards, accounting and an accompanying "trust in numbers" (Porter, 1995) proliferated at the heart of the economy, the sciences and the state. During the neoliberal era, numbers and calculation have come to fundamentally reframe public services, altering established norms of the common good, "corrupting" the intentions and knowledge of professional actors (Crouch, 2016).

Since the 1980s, calculative tools associated with New Public Management—international educational comparisons (such as PISA), and other

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A. Mennicken and R. Salais (eds.), *The New Politics of Numbers*, Executive Politics and Governance,
https://doi.org/10.1007/978-3-030-78201-6_4

forms of performance measurement, ranking and rating—have gradually expanded into not yet economized fields of public life, such as education and health, transforming not only the way these work, but also the very objectives they are pursuing. The human body and mind have not been exempted from these developments. Quite to the contrary: these have been a privileged object of quantification from the very beginnings of modern science, most notably in medicine (Foucault, 1973) and statistics.

The early Foucault (1975 [1995]) placed the body centre stage in his studies of power—see here, for instance, Foucault's analysis of Bentham's Panopticon as well as his writings on disciplinary society more generally. Later, Foucault revised the somewhat hierarchical notion of discipline by drawing attention to the interplay of power, knowledge and the self, focusing on "technologies of the self" (Foucault, 1988b). Since newly emerging forms of (digital) self-quantification rely on a quantified *self*-observation far more than earlier practices of self-observation (see for instance diary writing), they seem to be a good case in point for the study of new advances in quantification.

This is not to say that earlier instrumentations from the clinical gaze to statistical classifications and incentive pay systems are not related to subjectification processes and identity politics (see e.g. Espeland & Stevens, 1998). Nevertheless, the new movement in self-quantification indicates a considerable shift in agency. A growing part of the population in western capitalist societies is beginning to engage in new practices of quantified self-observation, thereby moving quantification beyond early aspirations, for instance aspirations aimed at putting a value on humans' competencies through marking (e.g. Hoskin & Macve, 1994).

From the measurement of sleep behaviour, physical and sexual activity, the evaluation of changing moods and labour productivity to the sharing of these data on the Internet, a wide range of calculative self-practices have emerged, validating Miller's (1992) early dictum that accounting as a mode of governing is as much about the calculated, as the actively calculating self. In this context, the Quantified Self movement (in the following: QS) is the most commonly known network of self-trackers and self-quantifiers. The official objective of QS "is to help people get meaning out of their personal data" (http://quantifiedself.com/about/, Accessed 16 July 2019). Patterns and orders of the self are to be discovered, which hitherto have been hidden within the muddy waters of everyday practice. Thereby, the self shall become aware of the hidden undercurrents of everyday practice, precisely those regularities which are

governing life without being visible for somebody living in a state of unquestioned familiarity with oneself. The self is called to reconstruct these undercurrents from the aggregated data obtained by systematically observing his or her everyday activities and whereabouts. Lupton (2016, p. 49) rightfully notices that the normative literature about self-quantification and self-tracking is above all pointing to the "ethical responsibility to achieve this authentic self", which "involves delving beneath the surface in order to uncover the hidden desires, drives and motivations that the psyche harbours".

In a first approach, self-quantification can be understood as the attempt to free ineffable corporeal experiences from the sphere of pre-reflexive and pre-predicative knowledge by formally representing and articulating them—in charts, numbers and algorithms, which can be shared, compared, publicly discussed and, eventually, optimized. Therefore, self-quantification presupposes the invention of specific taxonomies targeting body and life: inner sensations bound up with the living body as well as external circumstances and activities that have to be recorded and written down in order to reflect and act upon them. What is more, it is not just individual numbers and calculations that are thereby created. Individual datasets can be, and actually are, linked to other people's datasets, giving birth to entire systems of calculation, or rather "taxonomies of the self".

This chapter explores these taxonomies in the making drawing particular attention to the diversity of representational forms and moral conflicts involved. Digging into exploratory variety, playfulness and ambiguities are important in order not to misunderstand this emerging form of governing the self as a 'juridical' form of power. For what makes power powerful:

> […] is simply the fact that it doesn't only weigh on us as a force that says no, but that it traverses and produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression. (Foucault, 1980, pp. 118–119)

Therefore, the chapter's main focus is on the motives, practices and desires as well as the emerging instrumentation in the field. Showing how something as manifold, ambiguous and unique as the self might have a specific empirical worth requires certain agreements about how to measure and formally represent it, a process commonly dubbed as

"commensuration" within the sociology of valuation and evaluation (see Espeland & Stevens, 2008; Fourcade, 2011; Lamont, 2012). From here, some general conclusions about self-quantification and contemporary capitalism are drawn. In doing so, the chapter intends to keep a balance between the economic, cultural and moral dimensions of quantifying the self. This implies a theoretical approach, which is equally sensitive to Foucauldian studies of accounting and governing as well as a more practice-oriented approach related to the "sociology of critique" (Boltanski & Thévenot, 2006 [1991]). In this respect, this chapter might be considered an attempt to simultaneously apply exactly those two research perspectives on quantification that are giving this volume its theoretical appeal. We should not forget that the sociology of quantification always had its roots in both sides of the Channel.

While British critical accounting research, from the 1980s onwards, often followed a Foucauldian trajectory, French conventionalists were simultaneously leaving Bourdieu and Foucault behind by highlighting the practical capabilities of individual actors enmeshed in conventions (Desrosières 2011; Diaz-Bone & Salais, 2011; Diaz-Bone & Didier, 2016; Thévenot in this volume). At the intersection of these two frameworks, self-quantification emerges as a contemporary "institution of the self", not displacing but co-existing with established technologies of the self, such as religious confession, therapeutic and psychoanalytic approaches to identity and authenticity (Noji & Vormbusch, 2018). Consequently, self-quantification is as much a reaction to economic uncertainties and the ambiguities of individual worth as it is a cultural and ethical revolution, offering new foundations for a self which is more or less missing internal principles for action and orientation (see already Riesman, 1950).

While much research quite rightfully stresses the new potential for surveillance that QS-tracking offers (Whitson, 2013) and draws attention to accompanying forms of coercion, alienation and social-psychological pathologies (e.g. King et al., 2018; Lupton, 2015, 2016; Ruckenstein & Pantzar, 2017), it is also worthwhile to consider the ambivalences, ambiguities and contradictions associated with the practice of self-quantification. Sharon, for example, criticizes the polarized nature of the debate about self-tracking for health and asks how following a practice-based approach to self-tracking "can open up new spaces for the enactment of solidarity" (Sharon, 2017, p. 117). Likewise, Nafus

and Sherman (2014) stress the systematic tension between autonomy and subordination within the Quantified-Self movement:

> QS also does not escape the constructs of healthiness embodied in the devices that they use, inasmuch as those are the dominant constructs with which participants must wrestle. But wrestle they do. […] They interact with algorithms not as blind, mindless dupes, but as active participants in a dialogue that moves between data as an externalization of self and internal, subjective, qualitative understandings of what the data means. (Nafus & Sherman, 2014, p. 1793).

In this perspective, self-quantifiers, at least the early adopters within the QS movement, are not uncritically adopting new technologies and data. Instead, they appear to be capable and reflexive actors, deliberately inventing and manipulating technology in order to explore who they are and could become. This sheds light on a more general point highlighted by Diaz-Bone and Didier (2016). Reconstructing the influence of Michel Foucault on the sociology of quantification, they argue that Foucault "did not see that there are actually different statistical techniques and that it makes a difference. He linked statistics, all statistics, mainly to neoliberal Governmentality" (Diaz-Bone & Didier, 2016, p. 15). Alain Desrosières, to the contrary, was very aware "that different modes of quantification are associated with different modes of government" (ibid.), meaning that specific compromises regarding quantification, and thus "investment in forms" (Thévenot, 1984), solidifying the quantitative opportunities as well as related social power relations, would make a difference.

Corporeal Accounting Within Immaterial Capitalism

The QS movement gained considerable public attention in the U.S. for the first time around 2007. At that time, this movement could be called a kind of "grassroots quantification" movement. Obviously, there must have been more than just new technologies, such as mobile phones and the Internet to let self-quantification as an assemblage of practices unfold. Indeed, the emergence of self-quantification draws heavily on long-established discourses, such as discourses on the "sovereign self" (Miller, 1992) and liberal forms of governing (Foucault, 1981 [1976]), on economic transformations, such as the emergence of the network

economy and the rise and spread of self-employment, both closely linked to new orders of justification, such as the "project city" (Boltanski & Chiapello, 2007), and radical political reforms commonly dubbed "neo-liberalism", all of them preceding the QS movement by decades. Therefore, to understand the emergence of self-quantification, we have to take several interlinked processes into account.

Self-quantification is of great interest to the analysis of contemporary capitalism, because it is in this context that the individuals themselves are beginning to transform their body, their idiosyncrasies, their biographical experiences and—particularly important—their imagined futures in terms of quantified and comparable assets. By inventing the very categories and technologies by which an individual's manifoldness is made comparable and measurable, self-quantification constitutes nevertheless an indeterminate and malleable relay between the culture and economy of new forms of capitalism, be it "flexible" (Sennett, 1998), "cognitive" (Boutang, 2012), "emotional" (Hochschild, 1983; Illouz, 2007; Neckel, 2005a, 2005b), "corporeal" (Moore & Robinson, 2016; Smith & Lee, 2015) or "immaterial" (Vormbusch, 2008, 2009, 2012) capitalism. In these new forms of capitalism, immaterial capabilities are the most relevant source for competitiveness and profit, yet, there is still no agreement about how to commensurate subjectivities, let alone reliable methods to empirically measure and evaluate them. Both the economics of conventions as well as actor-network theory (ANT) share the idea that such commensuration requires an active "investment in forms" (Thévenot, 1984) in order to make things common and commensurable. Callon (1998, p. 6) complements this point by asking:

> In order to become calculative, agencies do indeed need to be equipped. But this equipment is neither all in the brains of human beings nor all in their socio-cultural frames or their institutions. What is it then?

For Callon, this equipment can be found in the prostheses rendering actants into calculable and calculating agencies. Some of those prostheses equipping the modern self with calculative powers are outlined later in this chapter. But actor-network theory's assessment might be judged unsatisfactory when it comes to the moral dimension of the "finishing process" by which humans are being made into subjects. If we view contemporary capitalism not only as an economic system but as a life-form, we have to take into account the moral conflicts that arise

when human agency is being made up by powerful inscriptions, such as new "taxonomies of the self" provided by practices of self-quantification. Later, we will analyse these conflicts as moral conflicts, rather than merely as conflicts of interest.

Examining the cultural significance of such "corporeal accounting" (Vormbusch, 2015) goes beyond traditional approaches to the study of accounting which have "largely focused on aspects of calculative practices subject to formal organization" (Vollmer et al., 2009, p. 2). It mirrors Didier's interest in "social spheres pretending to remain free from numbers" and in presenting this as a myth no longer suitable within modernity (see Didier's contribution to this volume). In doing so, we have to look for an accompanying shift in agency, since such practices of valuation seem to rely (even) more on the active engagement of the self than others. Whereas accounting in organizations has above all been analysed in its subjectifying capacities (see e.g. Miller & O'Leary, 1994; Mennicken & Miller, 2014), allowing formal organizations to control and to mobilize subjectivity in their favour, self-quantification, at least at its beginnings, has been driven by actors outside the context of formal organization, in their life-world and in the public sphere. One of the constitutive aspects of the QS movement, in particular, is its members' belief in the empowering capacity of self-quantification. As far as I can see, the claim of being recognized as unique as opposed to the way the self is treated within established social institutions (health care is one frequently cited example in this context) is fundamental for the QS movement, leading to the movement's critique of modern institutions as alienating, dispassionate and overall inappropriate for the demands of highly individualized actors within late modernity. Consequently, measuring oneself as being unique ("N=1" is one paramount element of discourse here, indicating that the only relevant reference point for measurement should be the individual) is one crucial promise within the QS movement.

In an unexpected turn in how quantification is regarded by the individuals themselves, it no longer appears to be a threat to how individuality is socially understood, constructed and experienced (such a critique would be in line with classical critical theory). Rather than threatening the integrity and incommensurability of the self, quantification is now warmly embraced as its central source. But it may well turn out that applying metrics to core attributes of one's (and everybody else's) self might as well erode the uniqueness and incommensurability of those who are striving for precisely that. The QS movement may just as well manifest itself as a

governor's dream: the dream in which subjects are striving to invent the very categories by which they can be best sorted, managed, activated and moulded in whatever way imaginable. In this sense, the QS may emerge as an exceedingly malleable self; a self always falling short; an unsatisfied self, striving for a better version of him—or herself through calculative means. On the other hand, the subjects engaging in self-quantification are motivated and mobilized by dreams that are just the reverse: namely to evade dispassionate and distorting social institutions which are perceived as being ignorant of and negating these subjects' concrete individuality.

This chapter analyses practices of self-assessment and self-optimization, which have previously been limited to small circles of "self-trackers" and "self-quantifiers" and are currently gaining currency within wider society, last not least, due to the increasing popularity of wearables, the Internet of Things and an ever more digitally connected lifestyle. The initial consideration for our empirical research was that self-quantifiers are, above all, confronted and required to cope with new forms of economic and cultural uncertainty—two fundamental traits of contemporary capitalism.[1] Coping with uncertainty in this context means the calculative quest for discovering the very categories by which the plurality of individual skills and capabilities as well as the plurality of the cultural forms of living can be inscribed into common registers of worth, thereby offering a specific answer to the complexities and ambiguities of life in late modernity (Vormbusch, 2016). The chapter seeks to shed light on some of the contradictions and ambivalences of these new taxonomies of the self: on the one hand, self-inspection through self-quantification might offer new possibilities for self-knowledge, control and emancipation, and could therefore be considered as a form of "enabling accounting". On the other hand, self-quantification threatens to subjugate ever more aspects of individual life by extending instrumental rationality to hitherto incommensurable and incalculable entities: the living body, the self, emotions and desires.

Calculation and the Living Body

It is not the first time that the body becomes the focus of technologies of the self. Social forces acting upon and through the body are evident at least since the works of Norbert Elias, Michel Foucault and Pierre Bourdieu. In a nutshell, notions of the "civilized body" (Elias), the "disciplined body" (Foucault) or the "body as capital" (Bourdieu)

highlight its relevance within historically variable regimes of social domination. In contrast, in early phenomenological thought (Merleau-Ponty, 1962) the "living" or "fleshly" body as belonging exclusively to oneself was perceived to be the only possible approach to the world. Here, the analytical priority is shifted from the body as product and mediator of social practices to the body as the only possible foundation of perception and action. The living body relates *my-self* to everybody and everything else, and simultaneously discerns *my-self* from everybody else, it is "my point of view upon the world" (Merleau-Ponty, 1962, p. 70). It is due to my living body that every possible experience in the world is related to my specific position within this world. The living body is the originator for any possible lived experience and remembrance. It is actively performing, processing and shaping our experiences. In phenomenology the living body is the unavoidable precondition of self-perception as well as the perception of others (Alloa et al., 2012).

Obviously, there is a strong contrast between the concepts of the living body and embodied experience, on the one hand, and the dominant view of calculation as an objectified body of knowledge, on the other. Quantification is intimately related to the instrumental domination of nature and the social world, an observation, which Adorno and Horkheimer (2002 [1944]), drawing on Max Weber, pointedly expressed, and which was later reformulated by poststructuralism. The opposite pole of possible experiential reality represents—at least within the phenomenological school of thought—our living body as "the bearer of the zero point of orientation", as a fundamental way of being in the world. In this perspective, the living body, as the mediator of every possible perception, is impossible to objectify. It cannot be measured and calculated in the same way that other "things" are being measured—not without losing its inherent qualities as an experiencing and experienced living body. The differentiation between "being a living body" and "having a body" (Plessner, 1970) therefore points to the limits of social rationalization. That which cannot be measured, which is always something unique and incommensurable, cannot become the object of formal optimization and instrumental rationality. At least not until now. The current explosion of technically mediated practices of self-quantification points to the historical variability of such a differentiation. It reveals that the distinction between body and living body is nothing ontological as in classical phenomenology, but socially malleable.

Whereas phenomenological thought is built upon the idea that no cognitive representations are possible without the living body actively performing affects, postures and body-environment schemes, the QS movement seems to rely on calculative forms objectively representing the body as a system of determinants. Whereas phenomenological thought regards inner sensations such as emotions, pain and hunger as being without extension, even without any dimension (Schmitz, 2009, p. 71), in the field of QS, measures and measurement procedures are invented for recording, articulating and "writing" them. What has been enclosed within the body shall be formally represented and made operable. But a multitude of transformations must be performed before these can be attributed to the living body. Keeping this in mind and referring back to the seminal works of Elias, Foucault and Bourdieu, the key question that arises is how such a "calculated living body" (a contradiction in itself from a phenomenological point of view) can be brought into existence at all; and how it is related to forms of governing within contemporary society. In what ways is the calculation of the living body making up specific subjects? And, conversely, what does this tell us about our contemporary societies?

The Quantified Self

The QS movement is a global network of self-trackers, self-quantifiers, entrepreneurs, developers and users of mobile and internet-based technologies of self-inspection. It consists of individuals, collective meetings, websites for comparing data and developing metrics, small start-ups and big corporate players from the telecommunications, sports and health industries. It also consists of specific objects that are shaped and introduced into the field by various actors. These objects include material devices, such as mobile phones and wearable sensors and computers, as well as immaterial objects, such as algorithms, apps, and data connections. The self-ascribed motto within the field reads "self-knowledge through numbers" (http://quantifiedself.com/about/, Accessed 16 July 2019).

By systematically quantifying their self-observations, individual users are striving for new insights regarding their bodily, mental, psychological or social status. This includes health data, food records, records of emotional ups and downs, including depressive episodes, sleep behaviour, digestive and sexual habits, the menstrual cycle as well as everyday patterns of movements and whereabouts more generally. Through

measurement, the quantified self is exploring his or her possibilities in new ways, opening up new perspectives on who one could be and how to get there: thus, the quantified self is, at least to a large extent, an epistemic self (Noji & Vormbusch, 2018). QS meet-ups are regionally concentrated in western capitalist metropoles (located in the U.S., Western Europe, Australia and New Zealand). Its protagonists—based on our observations, since no reliable data exist—often share a similar educational background and habitus (they are academically educated, technologically apt, prevailingly male, in their twenties and thirties).

Whereas the latest numbers show the active membership of QS (as a social movement and a community of practice) to be somewhere around 40,000 people worldwide, market surveys, such as the study by Grieger (2016), conclude that about 21% of the population in Germany is tracking at least one aspect of their lives on a regular basis. Whereas the latter figure might exaggerate the actual extent of the phenomenon, the first figure is equally misleading, because the social relevance of self-quantification reaches far beyond the inner circle of expert users who actively participate in a global community and who were the primary target group of our research.

Two aspects must be considered here: first, the social relevance of QS is not based on its widespread incidence, but on its character as a global laboratory for inventing new lifestyles and forms of ethics based on technologies and new taxonomies to live them. QS reflects as well as transcends contemporary capitalism by criticizing it. In this sense, today's practices of self-quantification might very well echo the metamorphosis of the Parisian Bohemia at the turn of the century: once despised by bourgeois morality, nowadays a blueprint for the "new spirit of capitalism" (Boltanski & Chiapello, 2007). Second, and directly associated with this, we can already observe a profound transformation of QS from an early "community of practice" (Wenger, 1998) to a mass-market populated by consumers, start-ups and the giant enterprises of the consumer, sports, and telecommunication industries. Self-quantification is on its way to becoming a constitutive part of the digital economy. This latest development is not the focus of this chapter; rather, it is the invention of the taxonomies that preceded it.

For QS-activists, quantification is their method of choice to unveil the undercurrents of corporeal experience and everyday practice. Florian Schumacher, one of the protagonists within the QS movement in Germany, summarizes the main aspects as follows:

> We are prevented from monitoring ourselves in a neutral way by protective mechanisms which evolved in the course of our evolution. Therefore, keeping a record of themselves serves for many people the purpose of observing changes or maintaining the motivation to achieve self-defined goals. The externalization of relevant information and its impact on our awareness evolves into a sixth sense allowing us to discover things lying hidden. (Interview with *Die Welt*, 12 October 2013, see http://www.welt.de/gesundheit/article120826726/Ein-sechster-Sinn-um-Verborgenes-zu-erkennen.html, translated by the author)

This is how one of our interviewees put it:

> […] Having the feedback cycle was really important. Having something to indicate you are stressed at the exact moment when my body was feeling stressed allowed me to see and make connections that I was never able to make before.

Making intangible emotional states visible ("allowed me to see") which are normally hidden to the self implies performative effects, meaning that the represented feeling may to a certain degree be an effect of the representational device or procedures themselves. This is suggested by the following quote from another interviewee, although this chapter will not elaborate on the discussion of performativity any further (but see Callon, 1998):

> What I really need is a stress alert system. I need something to tell me when I'm feeling stressed. […] Another thing that was pretty neat about setting up the stress alert system is: I started to learn how my body felt when that light was red.

Self-Quantification relies on technical artefacts, such as activity wristbands, body sensors, smartphones and internet-based diagnosis algorithms. Particularly within sports, the hardware sales of sensors, "smart" (connected) shoes, are on their way to becoming mass-market products and most producers are trying to establish a proprietary world of experience around this form of "connected sport" (see e.g. Nike^{plus}). Increasingly, practices of self-quantification are affiliated with gamification applications—partly to address motivational issues, partly in the course of establishing new products and markets. Some observers point

to the close relation between gamification applications and surveillance (Whitson, 2013). The integration of self-quantification into larger systems marks a clear break with the original intentions of QS, which surfaced as a form of reflexive monitoring of the self with the objective of healing oneself from chronic diseases and obtaining knowledge about one's own emotions and activities. From the beginning, one of the main topics of the QS movement was the care for the self and the living body.

A large number of the show-and-tell presentations on the global as well as local QS-conferences (https://quantifiedself.com/show-and-tell/) give an account of how people were experiencing long-term suffering without their suffering being institutionally recognized, let alone cured within the established medical system. QS at this stage represented an effort to radically switch from the established procedures of being classified and observed as an object within conventional medicine, where corporeal experiences are residuals or even disturbing variables to technically mediated practices of observation and treatment. The QS presenters, in this context, report healing from diseases commonly considered incurable, such as Crohn's disease. These healings are attributed to an often makeshift kind of self-observation based on numbers and quantification, leading to self-medication and radical redirection of nutrition and other living habits. From a rigorous methodological viewpoint, we are talking not about "big" but rather "dirty data" here: often there is no consistent control of how data are obtained and processed leading to a lack of validity and reliability and a kind of "makeshift-quantification". Nevertheless, these achievements have led to a systematic critique of how people are treated within the established medical systems and to increased calls for including personalized data into the diagnostic process as well as medical treatment (see for example http://quantifiedself.com/2012/04/talking-data-with-your-doc-the-doctors/).

The perceived objectivity and neutrality of calculation (Miller, 1992) as opposed to ineffable corporeal states play an important, even if not uncontested, role in this context:

> And to comprehend myself […] you can no longer trust yourself; there actually are so many scientific studies such as the Dunning-Kruger-effect from 1999, proving […] you are having a systematic bias when assessing yourself. That is, one cannot rely on one's feeling any more in different cases. […] For me, it is beside my subjective sense, I am interested in

> an objective perception toward myself, namely facts. There are quantifiable values and I can compare them and I can interpret and judge this completely decoupled from my personal feeling.

Various aspects of what Boltanski and Chiapello (2007) called the "New Spirit of Capitalism"—for instance, autonomy, authenticity, self-realization and networking—are pronounced characteristics of the field. QS in this respect may well be interpreted as being related to a "networked capitalism" built upon flexible networks of auto-entrepreneurs, who are competing and cooperating simultaneously. It is tied up with specific practices of making oneself visible through the web-based sharing of personal, intimate and performance data. It represents a field, which when encompassing the "community of early adopters" had the characteristics of a pioneering network. Meanwhile, there has been an intensified collaboration between users and developers of such self-quantifying technologies. Start-ups, industrial conglomerates and transnationals such as Google, Apple and the likes are investing and building networks in order to create new products and markets, thereby transforming the field.

In the following, we will describe the new taxonomies that are emerging, linking corporeal action and bodily enclosed experiences to accounting procedures. Thereby, the living body as the sensually given, pivotal point of being within the world (Merleau-Ponty, 1962) is being (re)framed and transformed.

Well-Being, Performance and Emotions as Core Issues of *Leibschreiben* (Writing the Body)

How is self-tracking actually performed and what effects does it have on individuals' self-perceptions? In stark contrast to the natural sciences, particularly medical science, the emerging forms of representing the self are to a considerable degree produced by lay actors outside of formal organizations.[2] The emergence of innovative *bodynotations*[3] indicates an entirely new operative scripture for writing the body. We are calling these emerging forms of representing the body *Leibschreiben* (Vormbusch & Kappler, 2018), hereby adapting the basic idea of accounting as a "writing of value" (Hoskin & Macve, 1986) to a certain degree. Alas, within poststructuralist accounting research a resilient concept of the embodied self as well as a concept of human reflexivity is lacking. Unlike poststructuralism, our approach tries to account for both: the sensations of the

living body as experienced by concrete individuals, on the one hand, and the emergence of an operative scripture as a form of writing the body related to social discourses, on the other hand. Furthermore, the justification practices constitutive of the actors involved are regarded as a missing link between these two levels of analysis, necessarily preceding the establishment and institutionalization of any operative scripture.

The Foucauldian strand of accounting research (for an overview see Roslender, 1992) investigated how established forms of reading and writing underwent fundamental transformations from the twelfth century onwards. Double-entry bookkeeping in this regard represented one major manifestation of the transformation of writing more generally; more specifically, it represented the "capital form of writing" (Hoskin & Macve, 1986). If we consider accounting as a specific technology within the broader transformation of writing and representing, then self-quantification can be regarded as one form of accounting for the self, as a form of "writing the self", reflecting the above-mentioned changes within contemporary capitalism.

Empirically, there is a wide variety of motives, techniques, programmes, apps, suppliers and objects assembled in the field. We encountered people who are measuring nutrition, physical activity and sleep, depressive periods as well as all kinds of emotional sensations they had throughout the day, some of them tracking their dreams, some of them stressing the importance of sharing their data, some opposing exactly this. As can be expected, there is a fishbowl of narratives, from the *empowerment* discourse (health as a personal "activity" and a "competence") to the *new spirit of capitalism* (sharing data to "connect to people"; sharing as the "new normal" of a new imagined society). In a first step of our analysis at least three distinct discursive and practice-fields within QS emerged: well-being, performance, and emotions (see Kappler & Vormbusch, 2014; Vormbusch & Kappler, 2018).

Well-being refers to the very beginnings of the QS-movement and smoothly connects to contemporary discourses of patient empowerment, public health and, more generally, the "wellness syndrome" (Cederström & Spicer, 2015; Davies, 2015). Many early self-quantifiers were personally affected by chronic diseases, and the public presentation and sharing of their experiences and calculative cure still is a much-appreciated part of every QS gathering. A fundamental critique towards the established medical institutions, types of treatment and forms of knowledge (as expert knowledge distinct from the lived experiences and circumstances of sick

people) went along with this. One of the main triggers underlying the movement therefore was a specific approach towards the "care of the self" (Foucault, 1988a) and the search for self-determined ways of healing on the basis of buried linkages between everyday practices and experiences, on the one hand, and the evolution of one's illness, on the other.

The second dimension, *performance*, refers to the ongoing transformation of work, particularly the "delimitation of work" within neoliberal work regimes, its deregulation and subjectification (Bröckling, 2002; Pongratz & Voß, 2003). From this point of view, quantifying the self might be interpreted as a form of subjectifying self-improvement of individual capabilities and human assets with regards to the market and the unrestrained performance requirements that exist within organizations and markets. In this dimension, self-quantifiers are exploring in what specific ways their capabilities might conform to market demands, including moulding themselves with regard to these perceived demands. Critics of these developments have argued that such a delimitation of work is associated with pathological forms of character formation within late modernity, with a tendency of getting "lost in perfection" (King et al., 2018).

The third dimension, *emotions*, refers to several processes within the social world which have been labelled either in terms of a shift of values from material to "postmodern" immaterial values, such as autonomy, self-realization and participation (Inglehart, 1971), or in terms of an "experience society" (Schulze, 1995), or in reference to the "commercialization" of emotions within emotional work (Hochschild, 1983). Neckel (2005b) argues that the modern subject is engaged in a specific form of boundary work caught up between conflicting social requirements: "social discipline", on the one hand, and "social informalization", on the other. Within the field of QS, emotions are not only an important reference point for increased self-awareness, but also a central element in self-presentations ("show and tell!"). Within contemporary capitalism, the awareness and management of emotions has become a major part of these subjects' cultural capital.

The Emerging Taxonomies of the Self

Inventing Representational Forms

Self-quantifiers are exploring a wide variety of different techniques, representational formats and devices for rendering their selves visible, comparable and manageable. These include narrative formats, such as diaries shared on the web, fully manual or semi-automated forms of measurement and personal feedback, ordinal and metric measures, formal representations and artistically interpreted data (such as graphs[4] or even paintings based on aggregated calculations). In particular, emotions are crucial for self-quantifiers, but only loosely coupled to conventions of how to formally represent them. In contrast to the established fields of writing value (corporate reporting, state statistics, bookkeeping, accounting) the representational forms in the field of *Leibschreiben* are still variable, malleable and non-standardized.

This is why apps such as *Mood Track Diary, T2 Mood Tracker* or *Worry Watch,* all of them easily available on Google Play Store or iTunes, are using quite different ways of "writing" emotions, some of them relying more on graphs, some on colour, some emphasizing the particular context in which specific emotions occur. Currently, the writing of emotions still relies on highly experimental networks of objects, calculations, visualizations and narrations. Following a social-constructivist approach to technology studies (Bijker et al., 1987), we can see that there are quite a lot of social groups participating in the creation of relevant techniques, and there is an equally high interpretative flexibility with regard to these techniques and the objectives of measuring. Similarly, one can also see a wide range of representational practices—starting with simple excel-sheets through the very popular diet apps right up to sophisticated apps demanding agency of their own as to whether and when the human actor is to give data input. In the latter case, the shift in agency from the human subject to internet-based applications is justified by two objectives: first, the elimination of subjective distortions during measuring (particularly a tendency of "measuring only when feeling good"), second, an increase in convenience and a resulting perpetuation of the individuals' motivation for measuring in the course of everyday life.

For example, the application *mood 24/7* (https://www.mood247.com) requires a periodical input of how a person feels by sending him or her an automated message as a call to action, inquiring: "On a scale of

1 to 10 what was your average mood today?" The accumulated longitudinal data are then visualized in a chart which can be shared with other users as well as medical doctors (*mood 24/7* was initially developed in the context of the treatment of depression). Therefore, the application is serving the two-fold goal of objectifying data as well as furthering perpetuation by shifting agency towards the device. Similarly, but more detailed, the application *Track Your Happiness* (https://www.trackyourhappiness.org/) is sending different questions several times a day. Preferably, the individual shall answer to these at once:

> […] so you get a text and then you go to a little app on the phone and there you have a slider board, with a zero to hundred happiness scale. And then usually they start off with how happy you are, and then it lasts until you answered a series of additional questions. Questions like whether you are inside or not, whether you have to do something, or you want to do it, your actual activity on what you are doing, we have a lot of categories, and then and so on. And so, you do it fifty times now, and you set the parameter to about three or four times a day, minimum. And you are supposed to go through that as responsibly as possible.

Apps such as *Mood 24/7* or *Track Your Happiness* are trying to objectify the measurement of mood and emotions by putting the app in control of the time of measurement and by standardizing stimulus and response. Thereby, the measurement of mood shall be made independent of the mood of the responding person and the context in which this person is located at the time of measurement. But objectification and better comparability have downsides as well:

> I was planning to get rid of all the stuff because I am working and this programme pops up and I think "aaaawww", sometimes I am really annoyed by my own programme, yeah, so sometimes I don't mind and sometimes when you are really into something, but sometimes, if I do not feel like, I don't fill it in.

The obvious problem is that the average answer's quality deteriorates depending on whether the situation seems inappropriate for giving input (such as having lunch with colleagues) or the subject "not feeling like it". As a consequence, devices automatically measuring the emotional state are being developed, such as the *FaceReader* (http://www.noldus.com/human-behavior-research/products/facereader). The *FaceReader* is

able to "read" and subsequently write facial expressions using seven basic emotional states. The current combination of these emotional states is entered into a two-dimensional grid, wherein the horizontal axis represents a continuum of emotional valuing, running from pleasant to unpleasant, whereas the vertical axis represents an activity dimension (active to inactive).

Generally, there is substantial disagreement in the field about how to represent the hidden inner state of emotional affairs, hitherto inaccessible to standardized measuring and quantification. The applied representational forms vary to a great degree, combining elements of text with numbers and graphs. The respective advantages and disadvantages are the topic of controversial discussion. Sticking to the topic of emotions, here is a quote from a self-quantifier trying to measure "happiness" and writing a kind of fortune diary which he shares with others on the web:

> […] I also feel very reductionist if I would do it by numbers, so if I would score it. So I am just curious if other people have experiences with things that are a bit more elaborated than a number, but not as free flow as words or things.
>
> The structure does not help you with emotions, because it is a structure, you do not need a structure but a flow.

In contrast to institutionalized fields of measuring, the absence of a structure is seen here as an advantage for measuring happiness. On the one hand, there obviously is a reluctance to "score" emotions; on the other hand, the interviewee is looking for a kind of middle ground: representational formats not as free as the "free flow of words", but "more elaborated than a number". On the one hand, self-quantifiers are striving for formal knowledge about their emotional experiences and quite often mistrust their own emotional sensations; on the other hand, some of them feel reluctant to formalize it too rigidly. Whatever they are experiencing, it should not be "reduced" or corrupted by the use of numbers. Analytically, emotions within cultural capitalism have to be rationally cultivated. From a participant's perspective, they shall not be simply subsumed to the logic and rigidity of measurement and thereby stripped of their complexity and richness. Such contradictions are well known from other fields of measuring, but they are more pronounced and more difficult to address when it comes to measuring inner state of affairs of the living body which have neither dimension nor extension.

Fortune diaries are another, more text-based approach for representing experiences and emotions. They can be shared via twitter, Facebook or other social media, thereby adding new possibilities of ordering and representing emotions, such as peak moments of happiness or sadness, which are built into the respective platforms:

> […] then wound up with a lot of private twitter accounts, that has kind of become the closest thing I am doing to journaling now. […] I had it since spring 2008 and I was doing a twitter study, and I had this whole archive and it was really interesting because the things in the sidebar contains all the years and stuff, it has got little bars of how many tweets there were in each month, and the peaks were […] when something really sudden was about to happen […]. And the other peaks were like things that were awful and very sad […]. And the peaks were when it worsened and when there were changes. And so there is this weird thing it ended up with being a very graphy, mood graph thing, I didn't realize that I was creating it as I did it. It just came out of my user statistics, and it came out of my journaling.

Sometimes, new and innovative forms of representing emotions emerge as an unintended bricolage, composed of different actor-actants (in this case, the user and twitter as a platform providing a graphic representation that was not initially directed towards emotions) and different symbolic systems (narrations as well as graphical representations for the measurement of "peaks" and "changes"). One could argue that QS as a network of post-traditional communities (Hitzler et al., 2008) explores possible ways of measuring and writing health, happiness and performance and thereby forms a global laboratory for doing so. Currently, the most common level of quantification for writing happiness is the use of ordinal scales. Often, for this purpose not only numbers are used, rather these are supplemented by graphical symbols and emoticons such as smileys or visual arguments such as colouration (indicating specific feelings such as red for warmth and tenderness, etc.). The following quote demonstrates that the use of these symbols should not be reduced to a mere assisting function. Quite to the contrary, they are a key means for the inner approval of feelings:

> […] and then I have this slider, which goes from zero to... I think it is actually divided in the middle, so you get five points to the left and then that is the best mood, for example, and to the right, and it is a good

> mood. And I also have this little smiley feedback. So, I put the slider and then I can see the smiley and [it] helps me to adjust, I think "No, not *that* happy, or...", you know, so that gives me kind of feedback to see, if I scored right on the scale. […] it is just on the continuum happy versus not happy.

Above all, the visualization of an emotion (the smiley) can evoke a sense of coherence between measurement and corporeal experience. In this case, a culturally codified symbol of feeling is serving as a mediator between the inner state of affairs and a metric scale, bridging the missing points of contact between these two. Obviously, this is pointing to questions regarding the epistemological relations between ordinal/metric values and iconic representations ("…No, not *that* happy") as being built into the programme and thereby decontextualized and fixed. While the contribution of formal representations such as graphs and icons to the production of knowledge is an important strand of research within the field of science and technology studies (Jones & Galison, 1998; Latour, 1998; Lynch & Woolgar, 1988), the relationship between formal representations and emotions has not yet been equally explored.

Moral Conflicts in Quantifying the Self

The tentative exploration of the self within QS involves deep moral uncertainties. Drawing on an example of a woman trying to quantify her baby's well-being, the ethical cleavages of self-quantification become apparent. Not entirely convinced by the belief held by some quantifiers that corporeal knowledge compared to quantified metrics should be regarded as inferior knowledge, this person is in an inextricable conflict. She is in deep worry for her baby. She is worried that he might not be sleeping enough ("He must sleep more and that is why I am using this app"). She is worried that she might not be there for him sufficiently ("that he is not getting enough of me"). And she is worried that he may not get enough food ("and when he slept in the meantime, then I know that it CANNOT BE hunger"). Therefore, she began using *Babytracker*, an application that can be downloaded via *itunes*. *Babytracker* is marketed for "busy parents" allowing them to "track everything from your baby's last feeding to that first smile". Parents get various screens showing a summary of events and activities directed toward the baby, in addition to several further screens with personal analytics regarding sleeping and

feeding patterns, time-weight graphs, etc., including the possibility to share these data with other parents either via a company-run database or other cloud solutions like Dropbox or iCloud.

Being aware of her concerns, the mother is trying to calm herself down by saying: "Children are self-adjusting somehow". She qualifies her quantifying of the baby quite drastically:

> Such an app is the exact opposite. It is not 'live and let live', trusting that things are just fine and that he will be sleeping and that he is getting enough of me in any case, but it [using the app, added] is above all to control.

Later in the interview she adds:

> In the end everything is getting much more complicated [by measuring it, added]. And much more stressful and it doesn't help you at all. And therefore ... because it gives you the impression you can control it … but a baby's sleep cannot be controlled.

Despite this latter statement the interviewee continues to give her account about how she is feeling by saying:

> And I hope that when having another baby, I think I will use this [the app, added] definitely again, because there have always been those moments when I was feeling helpless.

On the one hand, the interviewee is acknowledging a baby's general self-sufficient condition by expressing that "a baby's sleep cannot be controlled". With these words, she is referring not only to her child but rather to any baby's sleep or even more to the point: she is referring *first and foremost* to "any baby's sleep" and this should at least in theory include her own. On the other hand, she is drawn to the suggestion of control implied by measuring when saying:

> Data really help next to nothing. It's above all to know, okay, I am in control now and for example, okay, he isn't sleeping throughout the night anymore and he isn't sleeping enough during the day either … now I am going to take some steps … yes there is an idea, my plan has just begun … He must sleep more and that is why I am using this app.

On the one hand, the self-sufficient condition of babies and their practical routines do have a major moral significance for the interviewee. Her statement "a baby's sleep cannot be controlled" does not only tell the obvious; it is not only an observation of a baby's external condition and behaviours. It is also a moral statement about how things *ought to be* in general. That is why she is not addressing her own baby here, but rather every baby in the world. Her firm belief points to a state of affairs that should normally not be touched. On the other hand, her troubles caused by not being able to control what is going on are strong enough to override this feeling and to insert a new kind of device into the situation by measuring, thereby scraping the incommensurability (Espeland & Stevens, 1998) of her baby and her baby's sleep.

Obviously, this is not to say that she does not love her baby as a unique being and hers. But in the course of quantifying new possibilities for evaluating her baby in comparison with other babies (whose parents are also using *Babytracker* or similar devices) emerge, for example assessing his sleep, food intake, and attention. In this, as well as in the case of measuring moods, moral conflicts about if, when and how to measure qualities hitherto unquantified are emerging. The reluctance to score emotions (to "feel very reductionist if I would do it by numbers", see above) and the fear to corrupt one's authentic corporeal sensations as well as the anxiety to interfere with the autonomy of other living beings (as in the last case) are exemplary for what is at stake here. Drawing a line between commensuration and the still incommensurable for self-quantifiers in some crucial areas therefore arises not only as a technical problem, but rather as an everyday moral challenge.

Quantifying Performance: Alternative Measures, Rational Planning and the Deficiency of Corporeal Sensations

Another example draws on the quantification experiments of a passionate triathlete and is situated in the field of performance. Here, we find a variety of measures regarding physical performance. Moreover, this example shows the relationship of these key performance indicators with strategies for not only performing, but rather rationalizing sports performances, in this case triathlon:

> And this is interesting with triathlon. There is … sounds a little casual, but if you know this threshold value and the distance, you can just as well say,

> I am having a Watt-device here. I am adjusting as if having an autopilot. I would like to wind this exact capacity, then you simply wind one, two or five hours this capacity and you know that you are not losing too much power to reasonably finish the competition.

In a previous section of the interview, the interviewee already characterized the taking of his pulse as being much too imprecise for his purposes. Unlike taking your pulse, Watt values can simply and directly be recorded at the bicycle's spindle. In contrast to the generally delayed pulse values, Watt measurement therefore results in a kind of "instant feedback". In combination with the given distance it is possible to perform cycling as if being on "autopilot". It is only so that he can "reasonably finish the competition". Even more than the Watt-value, another performance indicator (VO_{2max}) is allowing him to measure his physical fitness comprehensively and to make projections, thereby introducing notions of the time value of performance:

> And what it [a 'smart' running watch from one of the main manufacturers, added] also can do, it aggregates everything I do into one measure or key performance indicator, one KPI and this is the VO_{2max}. This means okay how much oxygen can my body process per minute and per kilogram, and this really is the core measure for performance in the field of running. And what is really cool, you are provided with projections, straight from the watch: okay, how fast can I run this Marathon now and this is quite precise. … Thus, how fast I can run is depending on my lung volume.

To summarize, the interviewee is objectifying his bodily experiences and his sense of effort by framing it, firstly, in terms of the expended Watt-value during a competition, which, secondly, relies on VO_{2max} as the key performance indicator aggregating relevant parameters into one master-measure. This objectified bodily experience is the basis for the reframing of the body as a rational and improvable machine and for the development of related rationalization and optimization strategies.

In the following example, another notion commonly held by self-quantifiers becomes apparent: the notion of the deficiency of embodied experience.

> What really is absolutely interesting: when I wake up in the morning and I feel absolutely whacked and I am about to give up and get me a sick leave, I don't feel like working and I don't feel like anything. Then the

> device says I shall really take off today and then I am stepping outside and start running and really after some rounds I realize: This is really going to work, the body is really there. But the mind is saying otherwise.

Similar to the above sketched experimental forms of representing emotions, the performative capacity of representing the inner state of bodily affairs is obvious: only by "doing otherwise", that is by ignoring the sensations of his living body, the interviewee arrives at a state of affairs in accordance with the performance projections based on the measurement and evaluation of the collected data. Here, a second line of transformation of inner sensations by calculative means is observable; one that has been discussed above and concerns the translation of inner sensations into numbers and figures in order to formally represent them: the emphasis was on finding adequate, that is at the same time "exact" as well as "rich" and therefore necessarily blurry, indicators for bodily sensations. In the case just discussed the approach is shifting towards an "objectification" by framing the emotional state with the help of calculations which are then taken for granted. At the very least, these calculations are being given more credibility than the interviewee's experienced feelings. The interviewee is following an attitude quite popular with self-quantifiers: that numbers and data are "true" in a deeper way than bodily sensations and feelings. This is also expressed by another interviewee:

> There is a measurable value and I can compare this value and I can interpret and assess this value completely decoupled from my personal feelings.

Such a fundamental "trust in numbers" (Porter, 1995) corresponds with the feeling that "sometimes my body is playing a trick on me". This way, bodily sensations are framed as uncertain and unreliable–in contrast to the capacity of calculations to unequivocally represent and project the true state of affairs. Obviously, there is a great potential for alienation here: the starting point is not to delicately draw out how to translate inner sensations without corrupting them (as in the case of mood tracking), but rather to accredit to numbers and calculations a higher significance when it comes to the most intimate thing humans are made of: their living body. Admittedly, this rather orthodox approach relying on the "mechanical objectivity" of numbers and calculations (Daston & Galison, 2007) is not uncontested within the self-tracking community.

Conclusions

It is not at all by chance that new forms of calculating and valuing the self are emerging today. Rather, it can be considered a response to the experience of an increasing uncertainty in the culture and economy of advanced capitalist societies. Quantifying the self is as much about the self as a subject competing in markets, as it is about the cultural indeterminacy of today's forms of living. Both aspects are nourishing a comprehensive incertitude. Almost a century ago, Frank Knight (1964 [1921])—assuming that in a dynamic economy there is a great deal of imperfect knowledge of the future–distinguished between "risk" and "uncertainty". The former he reserved for situations where the probabilities for specific outcomes are, at least in principle, calculable. The latter describes "true uncertainty" within settings "not susceptible to measurement" (Knight 1964 [1921], p. 232). Knight, as an economist, believed that only true uncertainty "accounts for the peculiar income of the entrepreneur" (ibid.). Today, in a world where the realm of the calculable and the realm of the incalculable are simultaneously expanding, true uncertainty spreads, not only "ontologically", but empirically. Lifted into public consciousness with the terrorist attacks of 9/11 and the 2008 world financial crisis more recently, it might even be the most fundamental experience for a significant fraction of today's global population, forming their relation to the world, contributing to the rise of anti-modernist movements and political parties, thereby posing existential threats to democratic governing. Against this backdrop, quantifying your self seems to promise one possible answer to the challenges humans are facing today. It is not a random one, but one connecting the social incertitude triggered by Knightean "true uncertainty" with the calculative means provided by classical modernity.

Cultural uncertainty, to be more exact, is related to the principal openness and plurality of forms of living that require ongoing assessments with regard to who I am. Rosa (2016, p. 43) argues that individuals are not able to determine the inner core of their identity, since it has always been elusive. This seems to be even more so under the conditions of an accelerated, permanently shifting modernity. Paradoxically, these ever-shifting conditions solidify into a fairly constant pressure to carve out an authentic and socially recognizable identity. Consequently, we are observing a kind of *identity squeeze*: the more the foundations

of a robust identity erode, the more the subjects are occupied with the conditions for establishing it. On "slippery slopes" (Rosa, 2016, p. 691) the self is confronted with the urge not only to be oneself (that is, to be authentic), but also to discover ever more—fundamental and hidden—aspects of oneself in order to carve out what is essential and valuable about oneself.

Thévenot (in this volume) points out that calculation is about the "linkage between counting and counting on". In this sense self-quantification is about the individuals' concerns about what is left to count on when external pillars of the self are deteriorating. Obviously, it is less about what can be *found* as about how the inner pillars of the self can be *negotiated* and stabilized. It is about establishing a calculative truth about oneself which is only true in relation to a world which itself is constituted by numbers (see Salais, 2012, pp. 58–60, on the position of a constructivist realism). Therefore, QS can be seen as a datafied and technically mediated exploration process, whereby individuals try to give meaning to their life under the condition of losing touch with what Berger and Luckmann (1967) called a "natural attitude" towards themselves.

In exactly this sense, self-quantification represents a historically novel "institution of the self" (Hahn, 1982; Noji & Vormbusch, 2018) in the context of an extensive de-naturalization of the familiar world. It supplements established ways of reflecting on and caring for the self, such as the diary, the autobiography, and later various shades of therapeutic intervention. Certainly, its appeal is to be consistent with, if not the logical extension of, the evaluative cultures of contemporary capitalism and modernity itself. Measured and mediated by epistemic objects (see Knorr Cetina, 1999, 2007) such as smartphones, algorithms and apps, ever new angles on the living body and its everyday course of action are created. This ongoing exploration process is not a mere reflex of the actors' social positions and habitus, as could be argued in line with Pierre Bourdieu's sociology. And it would be just as incomplete and misleading to reduce self-quantification to self-optimization, since in many ways there is no fixed relation between ends and means. What self-quantification is for its participants has to be carved out in social practices and is (as of today) open for multiple meanings.

Self-quantification is as much about the actors' position in the social space as it is about defining who they are and who they ought to be. Nevertheless, it is not only about cultural uncertainty within late

modernity, but as much about economic transformations within modern *capitalism*. It is about the growing importance of self-employment, unfettered and "delimited" work requirements; deregulated and often precarious forms of work, project work and "work on demand". In brief, it is about the deterioration of supporting institutions which had assured long-term security for citizens in Fordist societies. A feeling of economic insecurity has become relevant also for the highly qualified and educated fractions of the workforce—precisely the group investing in new forms of quantifying their selves. "Real" uncertainty in this context manifests itself in particular as uncertainty about the worth of one's immaterial capital, and even more fundamentally about the *notion of worth* applicable to immaterial capabilities.

Institutionalized forms of calculating value in the economy are increasingly undermined by the emergence of so-called immaterial values (Eustace, 2000, 2003), and regular financial crises demonstrate the performative quality of value which is progressively detached from its material basis. This increasing uncertainty concerning the "value of goods" (Beckert & Aspers, 2011) can be regarded as the manifestation of a fundamental shift in the value basis of contemporary capitalism. As knowledge moves to the centre stage of today's economies (as different scholars as Peter F. Drucker and André Gorz argue), and as the "flexible self" (Sennett, 1998), the "enterprising self" (Bröckling, 2002) and the "manpower entrepreneur" (Pongratz & Voß, 2003) are becoming the foundation for competition and profit-making, from a functionalist viewpoint, new taxonomies are needed that are able to frame and calculate living subjectivity.

In earlier works I have argued that the valuation of immaterial capital bound up with the self is performed as a form of quantification that simultaneously relies on objectification as well as subjectification (Vormbusch, 2012). In other words, in order to get a grip on immaterial forms of capital (such as communicative skills, motivation and aspiration) the form of calculation itself has to change. Human Resource Management's latest incarnation, "people analytics" (see Goodell King, 2016; Rasmussen & Ulrich, 2015) and the QS movement have one thing in common: the quest for universally applicable orders of worth for subjectively bound and bodily enclosed forms of capital. It is only by inventing mundane and often conflicting forms of categorization on a micro-level that such new regimes of worth may solidify, and which might then, eventually, traverse the boundaries between the familiar world and the economy.

This is not to say that individuals are consciously striving to make their immaterial capital measurable and correspondingly valuable, or that there is a direct link to "objective" capitalist needs for value realization. This would be functionalist thinking. It is rather argued that a specific social disquiet in advanced capitalism evokes two interlinked exploration problems: explorations regarding the market relevance of the subjects' immaterial capital as well as explorations regarding the hidden undercurrents of their identity. Promising a specific answer to the complexities and contradictions of life in *late modernity* therefore relates closely to the invention of those registers of worth that *capitalism* functionally relies on.

In this sense, self-quantification is an emerging form dealing with the social incertitude constitutive of modern societies. It is about the quest for those qualities of the self, which are regarded as important within the economy and culture of contemporary societies and which cannot be derived from orthodox notions of value. QS therefore is a multifarious social praxis, creating new meaning, which punctuates and shifts the margins of, and boundaries between, economy and culture, and economic and cultural value.

Obviously, this does not simply mean the discovery of subjective qualities already present (and only hidden), but the creation of new forms of representing (and thereby generating) these qualities by creating the context, the observation apparatus (taxonomies) and the normative anchoring which brings them to light as new entities. Making things accountable is bringing them into existence in new ways, and this applies to corporeal accounting, too. In this sense, QS may be seen as a gigantic, globally dispersed laboratory wherein people are investing in new forms, by which the plurality of their individual skills and capabilities, their concrete diversity of living, their uniqueness and incommensurability are being made common and comparable.

Through self-quantification, the human body emerges as a new social entity. Since the turn of the millennium, the living body took centre stage as an object of technological malleability, epistemological deconstruction and social visions to exceed the established boundaries of the human. The living body, far from having ever been something given and uncontested (see the works of Elias, Foucault and Bourdieu), since then became quite a new recipient for questioning, evaluation and improvement. Currently, there is quite a momentum of forging the body into a new object of knowing, as well as the body being one of the core relays for social utopias (see the relevant debates from genetic engineering to transhumanism, see

also Lam's contribution to this volume). From a Foucauldian perspective this can be understood as the formation of a new proliferating field of force, suggesting new possibilities for the constitution of a productive subjectivity well suited for the new capitalism—and cutting off others. Here is not the place to discuss in detail the adequacy of a Foucauldian framework when it comes to self-quantification. Obviously, this article is only selectively leaning on such a framework, trying to bypass some of its problems.

Particularly, in order to avoid the equation of discourse and praxis this contribution is drawing more heavily on a participant perspective than Foucault normally did (see also Reckwitz, 2002). In accordance with the sociology of critique (Boltanski & Thévenot, 2006 [1991]), self-quantification can be seen as a deliberative praxis of competent actors. Exploring the cultural and economic qualities of the self by creating an abstract space to compare them, and at the same time extending the margins of accounting in this way, necessarily includes moral conflicts and justifications. Particularly, extending these margins of accounting (Miller, 1998) beyond the hitherto incalculable implies "ethical consequences that are often neglected" (Espeland & Yung, 2019, p. 239). Moreover, judgements about how to do things "right"—or to criticize them as being done the "wrong" way—not only refer to discourses but also to technologies, instrumentations, calculative schemes, formal representations, material (e.g. food) or immaterial (e.g. apps, algorithms, icons) things simultaneously. In this sense, actors are indeed "equipped" (Callon, 1998, p. 6), but this equipment and its practical deployment are in no way normatively neutral.

Both the Foucauldian and the pragmatist approaches have been criticized regarding their stance towards power and domination. Foucault has been accused of ignoring human agency; the sociology of critique has been criticized for ignoring the historically specific restrictions limiting the very possibility for critique (e.g. Celikates, 2006, 2009). We regard QS as an investigative praxis by which new forms of how people relate to each other and new meanings are created *without* neglecting hegemonic discourses (such as empowerment and the hailing of individuality as part of a neoliberal notion of freedom, or activity and connectionism as part of a "network city"). It is only when shifting the analytical angle towards the participants' agency and their capacities of critique that the diversity of their responses to the growing economic and normative uncertainty

in today's societies can be acknowledged. By criticizing the shortcomings of how individuals are treated within the established institutions of contemporary societies, and simultaneously embracing some of their central discourses, self-quantifiers are still bringing something new to these societies, hereby confirming the fundamentally dynamic properties of contemporary capitalism (see Boltanski & Chiapello, 2007). Summing up our fieldwork, what kind of critique is then articulated within the QS network of early adopters?

Regarding the *epistemic order*, any form of *subjective* knowledge is rejected, be it bound up with the living body or obscured within the muddy waters of everyday life. Regarding self-trackers' psychological disposition, every form of cognitive abstinence, apathy or naïve familiarity with oneself is rejected. In this regard, self-quantifiers are turning the "project city's" social activity imperative (Boltanski & Chiapello, 2007) inwards, relentlessly exploring what is going on with them. Any idleness and unexamined "business as usual" is dismissed. Above all, a person's *worthiness* is related to the truthfulness and sincerity one has towards him- or herself, towards the meaning of one's personal data, and the consistency with which data are transformed into action, even if this leads to discomfort and considerable strain. The underlying *ontology* is best described in terms of a cybernetic world, within which various entities, be it humans or machines, are connected through feedback loops which are objectified, permanent, preferably immediate, and quantitative.

Self-quantification operates as a relay between the institutional dynamics of capitalist change, on the one hand, and cultural dynamics, on the other. It is varied in its particular empirical shape but consistent in connecting the individuals with newly emerging orders of worth, evaluating their performative, emotional and practical capabilities by establishing new taxonomies of the self. "Accounting for who we could be" surely is no new motive within modern societies' institutional framework. But self-quantification deserves its designation as "accounting" more than the casual "skinny jeans" tracking, or Benjamin Franklin's crude moral bookkeeping. It is deepening the everyday and therefore intimate joints between the economic and the cultural dynamics of modern capitalist societies, highlighting the importance of new forms of creative calculation for capitalist dynamics. As of today, self-quantification is still made up of a diversity of actors, devices, instrumentations and discourses about the self. Considering the growing investments of corporate actors,

start-ups and state agencies, it is not unlikely to turn out as a social innovation "through which something that stands normally outside market exchange comes to be attributed an economic (monetary) value" (Fourcade, 2011, p. 1723). But quantifying, economizing and marketizing are quite different technologies (Kurunmäki et al., 2016) with quite different outcomes regarding participation and democracy. And self-quantification, as has been shown, is more than just plain economizing. A lot will depend on if and how "voicing concern and difference" (Thévenot, 2014) from a plurality of positions will remain relevant when self-quantification becomes a major component of emerging digital capitalism.

Notes

1. The article draws on the findings of the research project "Taxonomies of the Self" (http://www.fernuni-hagen.de/soziologie/lg2/Forschung_English.shtml) funded by the Deutsche Forschungsgemeinschaft (DFG). The project follows the methodological principles of Grounded Theory (Strauss, 1987) and has been conducted by Karolin Kappler, Eryk Noji and Uwe Vormbusch. In total, more than 100 different datasets have been collected and analysed, from qualitative interviews and participatory observations up to group discussions with self-quantifiers, software engineers and start-ups.
2. This holds true at least for the active participants of the QS-movement this article is focusing on. However, the balance between professionalized lay actors and formal organizations is just about to tip in favour of the latter.
3. The term notation originally refers to varying codifications of how to transcribe utterances and gestures of interviewees in the field of qualitative research. In our context, it indicates the various experimental forms by which inner sensations as well as physical reactions are "transcribed", written down and formally represented by the actors in the field.
4. See, for instance, Alberto Frigo's website: http://2004-2040.com/25_ar.htm, Accessed 19 July 2019.

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