THE POLITICS AND POSSIBILITIES OF SELF-TRACKING TECHNOLOGY

DATA, BODIES AND DESIGN

Suneel Jethani

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The Politics and Possibilities of Self-Tracking Technology: Data, Bodies and Design

BY

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Dedicated to the memory of Keshav Kumar Jethani

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About the Author

Suneel Jethani is a Lecturer in Digital and Social Media at the University of Technology, Sydney. He has published work in *International Communication Gazette*, *Communication, Politics & Culture*, *Continuum* and *M/C Journal*.

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Abstract

Collecting data about our lives, our bodies and our behaviours has become a part of everyday practice that promises greater self-awareness, healthier living and increased productivity. This book focuses on the dialectical relationship between those that design and use self-tracking technology in order to examine how logics of datafication redefine the body. It explores what these emerging relations mean for imagining, designing and analysing the sociotechnical systems that bring about self-tracking. The book provides a genealogy of self-tracking to situate the notion of quantified and quantifiable selves as problematic data regimes within contemporary digital culture. It charts the origins of self-tracking from within the blueprint of the Californian Ideology to a global social movement which now reaches beyond self-experimentation to encompass the wider trajectories of using wearable sensor technology in the neoliberal management of health, wellbeing and productivity. The book reframes and theorises the quantified self by re-examining and developing arguments of bodies which 'disappear' (Jewson) into, are made 'docile' (Foucault) by and get caught up in the 'rhythms' (Lefebvre) of datafication. The concept of a 'quantised' self is introduced as a means of reading into and exposing the inherent political interests being served when self-tracking technology is introduced into clinical, home and workplace settings. Drawing on the case studies of self-tracking in practice that precede, it the final chapter sketches the outlines of a mutual praxis of critique and design that facilitates the (re)imagination of the politics that are embedded into sociotechnical systems of self-tracking and considers possibilities of intervention.

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Introduction

> In order to analyse a little more precisely this new technology of government, I think it is best to catch it the three major forms that any technology is able to take in its development and history: as a dream or, better, as a utopia; then as a practice as rules for real institutions; and then as an academic discipline. (Foucault, 1982, p. 154)

In *Do Artifacts Have Politics?* (1980), Langdon Winner argued that a critical understanding of technology is established not only through considering how useful an artifact is in solving a problem, but by thinking about the ways that technologies bring about the embodiment of power relations embedded into them as they are designed, implemented and studied. Technologies that are used to capture data on our health, behaviours, routines and habits are increasingly becoming a feature of everyday life. The past decade has the 'quantified self' emerge as an idea that represents self-mastery, better health, resilience, self-acceptance and greater personal agency. Underlying the notion of a quantified self is an evolving set of technologies and cultural practices called 'self-tracking'. In its most common form, self-tracking can be understood as the use of wearable or mobile technologies embedded with digital sensors that measure and track locations, heart rates, activity levels, sleep quality, speech patterns, concentration, mood, posture and a number of other variables. According to BCC Research, the self-tracking technology market which also includes mobile digital technologies for personal consumption such as wearable devices and the platforms developed by Google, Xiaomi, Garmin, FitBit Samsung, Apple, Microsoft and others is set to reach 71.9b USD by 2022 (BCC Research, 2017). The enthusiasm for self-tracking is well captured in a report on Smart Cities authored by the multinational consulting firm, Deloitte where the quantified self is described as a trend that:

> …uses sensor technology innovation embedded in wearable devices to […] allow people to monitor their physical conditions, from blood pressure to heart rate to blood glucose levels and adjust their behaviour in real-time to make better health decisions. Self-tracking data may make individuals more receptive to behavioural nudges and can be used by policy makers to reward healthy [and active] lifestyles. (Deloitte, 2019, p. 39)

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This book describes some of the contexts in which self-tracking practices can be observed and explores the politics and possibilities that emerge when this particular class of technology is introduced into everyday contexts. It focuses on the complicated relationship between those that use self-tracking technology and the actors involved in its design. Through a discourse-oriented analysis of case-studies that portray self-tracking applied in clinical, home and workplace settings, this book seeks to outline a mutual praxis of critique and design that anticipates its emerging futures.

Nearly everyone I speak to about this project has a reaction to self-tracking. Even if it is not something that they practice themselves. These reactions are either optimistic and celebratory or fearful and dystopian. Sometimes they are pragmatic and accepting. Sometimes they are about tactics for refusal and resistance. Sometimes they are all of these things. The idea that self-tracking can be freeing and oppressive at the same time for the same person is the point of departure for this book. For those who self-track, whether it's by choice or not, it can be both a source and alleviator of stress and anxiety. For designers, self-tracking technology is a question of product optimisation and human ethics – or at least it *should* include the latter as a key part of the equation. For scholars, self-tracking technologies and practices are an object of study in the fields of computer and information science, Human Computer Interaction (HCI), Science Technology Studies (STS), sociology and media studies. Across the disciplines, it is also method for capturing research data. What's common to the domains of self-tracking design, use and research is the notion of 'lively data' (2018) a type of data about human bodies and lives that 'co-evolves with [its] human progenitors' (Lupton, 2018) and technical mediators (Verbeek, 2008, p. 100) forms its basis for design. But as an outcome of self-tracking, 'lively data' possesses:

> …other vital capacities because they are about human life itself, have implications for human life opportunities and livelihoods, can have recursive effects on human lives (shaping action and concepts of embodiment and selfhood) and generate economic value. (Lupton, 2018)

Design oriented discourse on self-tracking is all too often uncritically celebratory and rarely engages with its contradictions and complexities. These discourses are often stuck in utopian ways of thinking about technology where self-tracking is framed as innovative, altruistic and politically neutral. Some critical accounts of self-tracking (see Morozov, 2013, pp. 243–247) are all too often unfairly negative and predicated on simplistic accounts of power and its (a)symmetries.

In this book, I have examined self-tracking through the lens of this dialectic. The argument advances through three different prisms. The first is ideological, the second contextual and the third is anticipatory. An analysis of discourses surrounding the conception, evolution, experience and theorisation of self-tracking are at the core of its narrative. Having studied self-tracking for several years and working through various ways to present the material that is to follow, there was a turning point in this project at the Metric Culture conference held at Aarhus University in June 2017. The conference brought researchers together to:

> …critically engage with the nuanced aspects and multifaceted implications of living in a metric culture. [The] event [looked] at the ways data and metrics link to understandings of representations of the self and identity, to issues of power, control and to questions of value and agency [in order to interrogate] the kinds of ontologies, relations and communities that are emerging out of the hybrid interweaving of body and technology in the context of the quantified self and beyond. (Aarhus Institute of Advanced Studies, 2017)

It was in responding to this provocation that I started to think about how the critical study of self-tracking might benefit from a mode of analysis that seeks to examine the inscription of affordances into the sociotechnical systems involving the capture and use of self-tracking data. This is not a question that can be answered by just thinking about what technology can and can't do, but rather it is a question that requires us to think seriously about how the outcomes of using self-tracking technology come to be disempowering 'ironic, perverse and paradoxical' (Arnold, 2003, p. 234). And beyond this, how certain ideological and material forces pull in 'opposite directions towards contrasting outcomes [… and that when these contradictions are observed they can be] viewed within an axis of analysis framed by primary notions of their value and function; [therefore, undesirable effects] are thought of as being resolvable by tightening and limiting the conditions of possibility' (Arnold, 2003, p. 234) afforded by technology. As Peter Nagy and Gina Neff note, in using the concept of affordance, we 'all too often […] separate questions of the materiality of technology from discussions of [the] social construction of human agency, rather than engaging with materiality with any scholarly seriousness (2015). In order to do this, I argue, it is important to consider the underlying ideologies, power relations, and ethical tolerances that are built into specific instances where the capture of personal data occurs for the purposes of affording self-experimentation, self-governance and self-responsibilisation in space and time.

Throughout this book, I have tried to not only describe *what* self-tracking technology affords but *how* the design and implementation of self-tracking systems invites us to consider the politics (and value) of the ends it is achieving. In this sense, we might want to think about affordances as a way of seeing the 'analytical balance between materiality and human agency' (Davis, 2020, p. 5) in a way that can enable critical the apprehension of self-tracking at the levels of theory and design. The complex multifaceted nature of this relation results in affordances that are real, 'imagined' (Nagy & Neff, 2015) and *latent*. If we are to better understand the politics of self-tracking, then we can use the idea of latent affordance to explicate and anticipate the embodiment of the intertwined logics of self-tracking and datafication as a unique subjectivity resulting out of late capitalism's leverage of data-garnering technologies of all kinds.

Previous research has critically addressed self-tracking in the contexts of health (Rich & Miah, 2017; Ruckenstein & Schüll, 2017; Swan, 2013; Wolf & De Groot, 2020), work (Calvard, 2019; Moore, 2018; Moore & Robinson, 2016; O'Neill, 2017; Till, 2019) and the home (Lupton, 2016a, 2016b; Swan, 2012; Whitson, 2013). However, to date, little emphasis (except Crawford, Lingel, & Karppi, 2015) has been placed on 'object biographies' (Dannehl, 2017) and the material forces that

bring self-tracking technologies into the spaces and rhythms of everyday life. In taking an emphasis on the relations between use and design, in this book, I pick up on the call for greater conceptual work in critical data studies (boyd & Crawford, 2012; Dalton, Taylor, & Thatcher, 2016; Iliadis & Russo, 2016; Michael & Lupton, 2016) where self-tracking offers a thick and nuanced account of how the ongoing collection of personal data contributes to the production of subjectivity. There is little research addressing the materiality of self-tracking systems that engages specifically with design implications except Dolejsova et al. (2017), McKillop, Mamykina, and Elhadad (2018), Ayobi, Sonne, Marshall, and Cox (2018), and Schüll (2016) and in this work arguments tend to focus on self-experimentation as a dominant pattern of use. Within this frame of reference, design challenges are associated with issues such as data validity and reliability which are framed in terms of the collection standards required to meet the requirements of rigorous scientific research. This way of thinking about the design of self-tracking systems downplays concerns about privacy and reuse and runs the risk of inadequately acknowledging the tendency for obfuscation, falsification and avoidance which are not only an inherent part of the patterns of use we see in the use of many technologies that are designed to capture data, but also a form of 'strategic agency'(Bossewitch & Sinnreich, 2013) and 'informational self-defence' (Nissenbaum & Brunton, 2013, pp. 171–172).

If the question, posed by Marketa Dolejsova et al. (2017) and echoed recently by Wolf and De Groot (2020) of whether self-tracking systems should be designed with the aim of professionalising amateur self-experimentation, or to promote an agnostic approach to design that does not assume the superiority of one form of knowledge over another is to be addressed then several things need to be considered. This is a question that trades off adherence to narrowly defined technical logics against more open and genuinely human centric approaches to design. An extension of this is the question is: how are self-tracking systems are being designed in ways that enable access and reuse of data by others and to what end? Should the idea that sharing self-tracking data is altruistic and virtuous be taken at face value (by both users and designers)? How can critical frameworks developed with design in mind that help balance altruistic intentions with market led goals and objectives that support neoliberal agendas? Beyond this: how can thinking about self-tracking system design support outcomes that are socially responsible and how can they be brought closer to principles of inclusive design? Can those who are encircled by the logics of self-tracking systems be thought of as quantified, quantifiable and *quantised* selves? How can negative outcomes and other obtuse, idiosyncratic and iatrogenic aspects of self-tracking be genuinely accounted for within existing production methodologies such as Agile Methodology – which instructs designers to iterate rapidly, fail fast and build minimally viable products that can be refined once out to market. Similarly, Human Centred Design – which, in principle, tells us to be deeply user centric and inclusive of a broad range of archetypal user personas?

These are complex questions that I am attempting to address in this book. These questions require an approach that engages with a number of the inherent tensions that flow through this particular class of technology and sociotechnical system. First, is the tension between efficient data capture and the way that the logic of data

capture mechanisms align to individual experiences that shape what it exactly is that makes self-tracking meaningful to users. Second, because sustained user engagement is critical to the success or failure of self-tracking technologies, their design might not include 'dimensions that are not a priori important to the ultimate goal of the tool' (McKillop et al., 2018, p. 10) and this has a limiting effect on how these tools might be granting personal agency or be socially progressive. Third, negative experiences of self-tracking might only be considered as part of the problem that a technology is trying to solve and not something that the technology itself brings about in the problem-space that it is being designed for. Fourth, data capture might not always be conceived as something that has varying resolution relative to the diverse range of times, spaces and bodies implicated in its use. Fifth, is the question of how contemporary examples of self-tracking technology draw from, or a distanced from, both materially and semantically their functional, morphological and ideological antecedents? Sixth, and finally, there is the relation between the device and the data it produces – if artifacts are political then which one should we be more concerned about devices or datasets? And by extension, to what extent is self-tracking data *personally* meaningful (Ayobi, 2018) and can design accommodate combining, switching or differentiating between devices and modes of data capture such as private, pushed, communal, imposed, and exploited (Lupton, 2016b) when there is a 'gap between the user and their data' (Schüll, 2016, p. 10)? Is this space where a politics of self-tracking emerges?

The approach I have taken in addressing these issues and questions is one that looks towards the goals, intentions and consequences of self-tracking. I do this through an analysis of the trajectories that take it from conception to application. I question the specific shared assumptions and beliefs that need to be assimilated between designers and users for self-tracking systems to be functionally and ideologically coherent. Here design is thought of as a verb rather than a noun (Miettinen, 2008, p. 219), it is not simply a matter of good or bad design but rather it is something that is *done* and done with *intention*.

As a practice, design absorbs ideology through discourse (van Dijk, 2006, p. 133) and as a systemic process with inputs, outputs and resources that guide it, it uses discourse to access and translate ideologies. As a research domain, design reflects a meta-ideology resulting from the collection of different discourses that are brought together and channelled towards production processes that sees them embodied in the form of artifacts and at the level of somatic bodies, data-bodies and the body politic. The discourse-analytic approach taken in this book is not one that merely seeks to uncover the underlying ideologies informing the design of self-tracking technology, but rather one that hopes to illuminate techno-cultural hegemony and the manner in which it is reproduced (Lupton, 1992, p. 149) in the evolution of self-tracking systems. Given the contingent nature of self-tracking system design – where there are dependencies on commercial actors for components, software, storage, hosting and so on – and many intermediaries involved in its implementation, ideology is perpetuated by mechanisms that are not entirely transparent. These mechanisms can be hidden from designers by way of the briefing process or they can be hidden from other stakeholders by the normal conventions of design processes and contractual arrangements between clients and vendors.

Discourse shapes how designers, users and researchers engage with self-tracking in terms of: what it is that they do, what activities constitute good design, proper usage and adequately critical research, the norms and values that are upheld in each of these three domains, and the resources that one would expect to have access – or privileged access – to in order to undertake work in each. The discourses surrounding practices in each of these domains reflects a 'web of activities that surround objects rather than the things themselves' (Prior, 2003, p. 2). The 'thing-ness' of technologies, bodies and data, and the matter of involvement with the conditions that bring them into being as situated products designed and used collectively in dynamic social settings. In choosing to analyse discourses about self-tracking including social media posts, blogs and blog comments, patents and others, I have considered questions such as who has authored and contributed to perpetuating certain ideas about the quantified self and how they are, and can be interpreted (Prior, 2003, p. 26) *against the grain* re-framing certain narratives as alternative views that help us see the forces that shape the social and emotional dimensions of self-tracking practices.

Annemarie Mol reminds us that '*ontology* is not given in the order of things, but that, instead, *ontologies* are brought into being, sustained or allowed to wither away in common day-to-day sociomaterial practices' that constitute patterns of technology use (Mol, 2002, p. 6, their emphasis). And in order to shed light on these practices, I draw on Donna Harraway's idea that:

> …an 'ethnographic attitude' can be adopted within any kind of inquiry, including textual analysis. Not limited to a specific discipline, an ethnographic attitude is a mode of practical and theoretical attention, a way of remaining mindful and accountable. (Haraway, 1997, p. 39)

The notion of a 'quantised self' that I wish to advance in this book is both a metaphor and a logic for the technocratic governance of human bodies and lives. I want to convince the reader that is something that we should acknowledge and treat with intellectual curiosity, theoretical openness and trans-disciplinarity when we do research into self-tracking and with precaution when systems are being designed. It is something that should be accounted for in technology design by viewing it as an outcome *to design against*. The 'quantised self' extends the socio-material outcomes of mediation such as alignment, error correction smoothing out and the removal of imperfection, which are effects that are commonly observed when varying phenomena such as light, sound and shapes are rendered in digital form. I borrow this term from audio production technology (e.g. drum machines and MIDI sequencers, see Lanier, 2010, pp. 9–10) where the quantise feature is used to correct human variation and snap drum hits into precise and predetermined grids. In image processing quantisation is the lossy file compression that occurs when a range of values are flattened into one such as when the number of colours in an image are flattened into a few or when brightness variation values are rounded the resulting image is an inexact approximation that is made from partial data. These techniques are irreversible and their effects are not easily perceptible to the observer.

In summary, the decision to study the politics and possibilities of self-tracking through ideologies that shape design has been undertaken here to complement, nuance and extend existing studies of self-tracking. Its outcome, if read in the spirit that it is written is to see the outlines of a mutual praxis of critique and design that contributes to facilitating the (re)imagination of political effects (and affects) that are embedded into quantified, quantifiable and quantised selves as they are fashioned and perturbed by the data-driven logics that are governing everyday life. It seeks to answer three questions:

(1) What is the quantified self, how can it be situated as a data capture regime in space and time, and how has it become an ideological frame for the data-driven governance of bodies and lives?
(2) Through what sociotechnical trajectories are self-tracking technologies finding their way into health, home and work and refashioning the way that bodies are defined and represented, and, how can tracing these trajectories expose self-tracking as inherently political in terms of whose interests it serves?
(3) How can understandings of power relations embedded in self-tracking be developed in ways that might be assimilated into the existing and commonly used methodologies to design sociotechnical systems?

The book unfolds in three parts, each emphasising one of the questions above: (Part 1) *Visions: Quantified and Quantifiable Selves*, (Part 2) *Rules/Affordances: The Embodied Practices of Self-Tracking* and (Part 3) *The Quantised Self: Discipline and Design. Visions* is about the ideology of datafication and its relationship to technology and self-experimentation. It looks at how the emergence of the 'Quantified Self' a cultural movement founded on these ideals about a decade ago, came to intersect with and then encompass and intersect with a wider trajectory of technology use for the purposes of self-surveillance, health vigilance and self-responsibilisation. Borne out of the notion of the quantified self is a form of personal data capture that has been picked up by healthcare institutions under the auspices of personal, participatory and precision medicine. The various divisions of labour and representations of bodies are examined through Nicholas Jewson's notion of 'disappearance' of the body in order to set the stage for the discussion of self-tracking in other contexts beyond healthcare.

In *Rules/Affordances* recent developments in self-tracking are placed in a broader historical context. First, it looks at the evolution of electronic monitoring for the purposes of house arrest and home confinement as a key antecedent to contemporary applications of self-tracking technology. It argues that there are important lessons to be learnt from it as a case study. It then turns to the use of self-tracking to measure social interaction in the workplace. It argues that as an extension of practices that one comes to expect at work – such as being audited, having to record and account for time spent on tasks or having communications monitored – the use of self-tracking technology blurs the boundaries between work/life, data/body and self/other in ways that make it difficult to for persons to act with agency.

The final section, *The Quantised Self* is more nebulous and speculative. It takes the account of bio-power predicated on Jewson's extension of Foucault's work and integrates it with humanist Marxist, Henri Lefebvre's writings on rhythms. It is about the broad rhythmic patterns that one might see in various facets of self-tracking technology use and design. The narrative posits that a designer has a similar relationship to technical artifacts as a breeder or trainer does to the animals they tend to (Brey, 2008, p. 72). Here the double meaning of discipline – docility in the Foucauldian vernacular and as *dressage* in Lefebvre's writing – are developed as the basis for proposed conceptual tools that can be drawn on to better understand the mediating role of self-tracking systems in critical (and ethical) assessments about the standards-based ideological and technical construction of subjectivity arising in self-tracking in society.

Summary of Chapters

Chapter 1 disambiguates the Quantified Self (QS, the cultural movement) from the 'quantified self' as used to refer to self-tracking more generally. The chapter unfolds as a dialogue with documented traces of the QS (see Hepp, Breiter, & Friemel, 2018) movement and explores how the QS′ vision for 'a better life through numbers' has deep roots in a positivist view of the relationship between technology and human agency and has common actors that have been actively involved in its leadership going back to the 1960s American counter culture and co-evolves through particular attitudes about techno-libertarianism and the supposed openness of digital culture. The chapter argues that the QS was developed by a group of people in a particular area at a particular time who were informed by the experiences and agendas of certain people advocating for a set of positivist historical, social, economic and political ideologies about the potential of digital technology. The framing of the QS as grassroots, self-experimental movement guides and legitimates the development of self-tracking in ways that downplays some of the problems of self-tracking technology use and this effect is achieved predominantly through discourses (Meetups, annual conferences, articles, talks and academic publications) of the QS as a pioneer community (see Gerhard & Hepp, 2018; Hepp, 2016, 2020, Hepp, Alpen, & Simon, 2020; Ruckenstein & Pantzar, 2017). As this frame is extended, amplified and transformed (Snow, Rochford, Worden, & Benford, 1986), these forces of aligning ideologically congruent but structurally separate forms of meaning-making bring about what we understand as contemporary self-tracking.

Chapter 2 turns from the quantified self to the *quantifiable* self and looks at self-tracking in the context of contemporary healthcare and the industries that are attached to it. The focus is on the commodification of personal data and how this is restructuring of relations between patients, clinical investigators, healthcare institutions and technology companies. As a value proposition, self-tracking produces a eudaemonic self and this conception of selfhood is contingent on the ability to strategically leverage data (and data acquisition and interpretation techniques) in the 'continuous process of identity construction' (Sharon & Zandbergen, 2017, p. 11). Drawing on Nicholas Jewson's (1976) tracing of the transition from bedside to laboratory