

Counting Sleep

Ambiguity, aspirational control and the politics of digital self-tracking at work

Elmholdt, Kasper Trolle; Elmholdt, Claus Westergård; Haahr, Lars

Published in:
Organization

DOI (link to publication from Publisher):
[10.1177/1350508420970475](https://doi.org/10.1177/1350508420970475)

Creative Commons License
CC BY-NC 4.0

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Elmholdt, K. T., Elmholdt, C. W., & Haahr, L. (2021). Counting Sleep: Ambiguity, aspirational control and the politics of digital self-tracking at work. *Organization*, 28(1), 164-185. <https://doi.org/10.1177/1350508420970475>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Counting sleep: Ambiguity, aspirational control and the politics of digital self-tracking at work

Organization

2021, Vol. 28(1) 164–185

© The Author(s) 2020

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/1350508420970475

journals.sagepub.com/home/org**Kasper Trolle Elmholdt** 

Aarhus University, Denmark

Claus Elmholdt

Aalborg University, Denmark

Lars Haahr

Aarhus University, Denmark

Abstract

Existing perspectives on normative and aspirational control have undertheorised how digital technologies such as digital self-tracking might alter what kinds of control is possible in the workplace. This article remedies this lack by studying the affordances of digital self-tracking in the workplace. Empirically, we draw on a case study of digital sleeptracking in relation to a well-being initiative in a private energy company, Encorp. Our analysis reveals how digital self-tracking affords body visibility and remote management but also creates affordance opacity and an ambiguous space of autonomy and control. We theorise how digital self-tracking in the workplace both enables new forms of aspirational control, and creates ambiguity and new limits to control. We conclude by discussing challenges and opportunities for future research on digital self-tracking in the workplace.

Keywords

Algorithmic recording, algorithmic technologies, aspirational control, control, datafication, digital selftracking, technology affordances, normative control

Introduction

In 2016, Encorp,¹ a large energy company headquartered in Denmark, launched a well-being initiative targeting their employees' sleep habits via digital self-tracking. Motivated by their conviction

Corresponding author:

Kasper Trolle Elmholdt, Aalborg University, Fibigerstræde 3, 9220 Aalborg Ø, Denmark.

Email: elm@dps.aau.dk

that private and work lives have become inseparable, the Encorp HR director explained how well-rested employees are generally healthier and perform better. She explained that, 'we therefore also see it as our responsibility to try to help our employees to help themselves by improving their sleep'. HR emphasised that participation in the initiative was not obligatory, and that it was merely an opportunity for employees to take responsibility for their own health. The Encorp employees saw the project as sending mixed signals: Some saw it as part of a 'caring company', accepting it as an option to gain self-control; others saw it as signalling unattainable ideals. While HR hoped the digital self-tracking would enable them to relate sleep data to employee performance, and improve employee sleep-awareness, the data revealed uncertain results. HR was troubled by this and struggled to intervene, and some employees started speculating about what happened to their sleep data, and what kinds of control could be possible in effect.

As the case illustrates, the expansion of new digital technologies in the workplace, such as self-tracking and other 'algorithmic modes of management' (Beverungen et al., 2019; Faraj et al., 2018; Kellogg et al., 2020), raises new questions regarding the longstanding research agenda on attempts at shaping and controlling employee behaviour (Barley and Kunda, 1992; Jenkins and Delbridge, 2014; Sewell, 1998). While existing studies of organisational control have explored how rational and normative ideologies are deployed to influence employees (Barley and Kunda, 1992; Kellogg et al., 2020) and how management often solicits employees through discursive aspirations (Fleming and Sturdy, 2011; Jenkins and Delbridge, 2017), the expansion of algorithmic technologies has been suggested to present new options for managerial control (Kellogg et al., 2020).

The use of digital self-tracking in the workplace provides a critical yet underutilised case for exploring how new algorithmic technologies might alter control (Davies, 2018; Lupton, 2016a: 91; Moore et al., 2018). While self-measurement practices are ancient, the emergence of digital tools for quantifying the body, especially 'wearable technologies', has changed how people engage in these practices (Dudhwala and Larsen, 2019; Moya and Pallud, 2020). Digital self-tracking is widespread, and the concept relates to the notion of 'the quantified self', denoting practices of quantifying an individual's bodily functions and behaviour through a digital tool and turning these metrics into recommendations for exercise, eating, sleep etc. (Lupton, 2016a; Przegalinska, 2020). Digital self-tracking has therefore been argued to provide a particular mode of control, which is not only a panoptic disciplinary surveillance or control that 'watches from above' but just as much 'watches from below' (Mann and Ferenbok, 2013). Many researchers have provided insights into the digital 'private self-tracking' machinery (Moore and Robinson, 2016), but 'pushed self-tracking', which is self-tracking encouraged initially by another agency (e.g. the workplace), has only been explored marginally (Lupton, 2016b). This is a critical shortcoming, since digital self-tracking technologies are a growing part of workplace (wellness) programmes, not least in the United States (Lupton, 2016b), and are often described in rosy terms as 'positive computing devices' (Calvo and Peters, 2014; Przegalinska, 2020) utilising the latest technology to create emotional agility and engagement (Davies, 2018).

Like other technologies, digital self-tracking provides affordances or options that 'favour, shape, or invite, and at the same time, constrain' certain lines of action (Zammuto et al., 2007: 752). Digital self-tracking has been argued to afford 'counting' (Davies, 2019) and is often considered at the centre of the 'datafication' of health (Hong, 2020; Mau, 2019; Ruckenstein and Schüll, 2017). By producing countable performance indicators through digital biometric data, digital self-tracking technologies are considered to provide new modes of digitally enabled self-conceptions, which sensitise to matters of which one was previously unaware (Hayles, 2017). Davies (2019: 516) describes digital self-tracking technologies as 'technologies of control' and underscore the inherent normativity of the measures produced. Other scholars have suggested that digital self-tracking, like other algorithmic technologies, subscribes to a rationalistic mode of data-based control that works

discretely at a distance (Beverungen et al., 2015; Kellogg et al., 2020). This aspect has been argued to enforce neo-liberal management ideals and subtle modes of self-control, which may even become disempowering (Davies, 2019; Przegalinska, 2020). While the controlling features of digital self-tracking might be questioned, empirical close-up studies of which new modes of control digital self-tracking might make possible in the workplace remain scarce. We respond to this scarcity by exploring the kinds of control made possible and which may emerge through digital self-tracking.

To address this scarcity, we leverage the concept of affordances, which suggest a focus on what the digital self-tracking encourages, discourages and allows users to do with respect to organisational arrangements (Davis and Chouinard, 2016; Paring et al., 2017). Empirically, we draw on the aforementioned case in Encorp, which offered its employees opportunity to participate in an experiment about improving their sleep by using a digital self-tracking device. The initiative was very much in line with the broader cultural interest in sleep and health data (see also Barnes et al., 2015; Ruckenstein and Schüll, 2017) and how to make time for sleep and work–life balance (Wajcman, 2015).

On the background of this case, the article makes three main contributions. Firstly, it identifies three different affordances and shows how digital self-tracking enable a contested space of autonomy and control or empowerment and disempowerment. We thus respond to recent calls for studying algorithmic control through new digital technologies such as self-tracking (Kellogg et al., 2020). Secondly, our study illuminates how the affordances of digital self-tracking links discourse to matter by making discursive ideals an embodied experience for the employee. Thenceforth the article contributes to the longstanding interest in aspirational modes of control within organisation studies (e.g. Costas and Kärreman, 2013). Finally, our study sheds light on the politics of digital self-tracking (Moore and Robinson, 2016), it shows how responsibilities are delegated and reveals the limits of control.

In the following sections we introduce the theoretical and empirical resources for this article. From there, we turn to the concept of affordances and introduce and analyse our case. We conclude by discussing implications for the literature.

Theoretical framework

Algorithmic affordances and control

A significant body of literature has pointed out how employee behaviour and subjectivity are attempted regulated via different kinds of control (Alvesson and Willmott, 2002; Barley and Kunda, 1992; Fleming and Sturdy, 2011; Jenkins and Delbridge, 2017). In their seminal article, Barley and Kunda (1992) suggested that ideologies of control have historically oscillated between rational forms of control appealing to employee self-interest to organise effectively versus normative kinds of control soliciting employees' 'thoughts and emotions' to win 'the hearts and the minds of the workforce' (p. 364). Algorithmic technologies with an ability to turn qualitative inputs into numerical outputs in the form of digital data have been argued to provide new, more extensive options for control that mobilise employees in new ways (Curchod et al., 2019; Kellogg et al., 2020).

Studies of private self-tracking have stressed how the production of statistics about one's own body afford a means 'of taking control over what is considered a chaotic experience' (Anderson and Whyte, 2014 in Lupton, 2016a: 72). By encouraging self-monitoring (Moya and Pallud, 2020: 3, Rockmann and Gewald, 2017) and social comparison (Mau, 2019; Zhang and Lowry, 2016), scholars have stressed how digital self-tracking has empowering effects, giving users 'control over the determinants of their quality of life' (Tengland, 2016: 34). At the same time, studies have also pointed out the risk of disempowering effects such as guilt and body-punishment (Moya and Pallud, 2020: 3; Tengland, 2016). Moore and Robinson (2016) critically consider the

self-controlling aspect of digital self-tracking as part of neoliberal management ideology, which they worry creates inappropriate performance ideals and precarious working conditions with detrimental effects for employees.

Although digital self-tracking within organisations is scarcely studied, an emerging and complementary literature on algorithmic control has pointed out new options for centralised management to monitor employees. In a recent review, Kellogg et al. (2020) consider self-tracking alongside other algorithmic technologies as a kind of ‘algorithmic recording’; that is, ‘computational procedures to monitor, aggregate and report’ finely-grained data (p. 376). Drawing on labour process theory, Kellogg et al. (2020) suggest that algorithmic technologies rely on a new form of rational control that remedies bureaucratic and technical modes of control. They propose that ‘algorithmic control’ relies on four main affordances: (1) comprehensiveness – previously unobservable worker behaviours can now be scrutinised; (2) instantaneity – the algorithm enables real-time feedback in terms of ‘nudges, rewards, and penalties’; (3) interactivity – employers can interact with their employees continuously, comparing and exchanging data easily; (4) opacity – the nudges and direction provided by the algorithm are often subtle and impervious (Kellogg et al., 2020: 386–387). Accordingly, algorithmic control revolves less around the human manager and more around employee interaction with a non-human algorithm, effecting a ‘disintermediation of managers’ (Kellogg et al., 2020: 387). This idea resonates with the study of social media by Beverungen et al. (2015), who pay particularly attention to how algorithmic control may be understood as working through codes, algorithms, and protocols (e.g. the Facebook ‘like’ button). Inspired by Galloway’s (2004) decentralised understanding of control, Beverungen et al. (2015) suggest the term ‘protocological control’ to understand how Facebook effectively manages its users by distance via the design of website features, arguing that the ‘like’ button protocols configure the users in ways that guide their behaviour at a distance.

While algorithmic control may be considered a new mode of rational control, the ability to represent and make action visible through algorithmic technologies (Flyverbom, 2019) also encourages employee self-surveillance, which has normative implications. Manley and Williams (2019) explored how a rugby club leveraged biometric measurements and algorithmic management through an app, which reported biometric data. They found that the permanent gaze of the organisation incited performance fatigue, feelings of anxiety, precariousness and a blurring of the ‘boundaries between personal lives and institutional agendas’, holding the players accountable for more and more of their lives (p. 11). Similarly, Anteby and Chan (2018) studied how employees handling baggage in a large U.S. airport were exposed to a surge in technology-enabled baggage-theft surveillance: Employees voiced an experience of their physical behaviour being constantly observed, which made them resist the managerial surveillance by calculating their visibility and engaging in invisibility practices to remain unnoticed. As such, these empirical studies critically illustrate how algorithmic technologies are also considered to work as a kind of vertical surveillance or panoptic and disciplinary control. Digital self-tracking may thus be considered to also contain control mechanisms that operate by soliciting the ‘inside’ of the employee, their hopes and their fears (Alvesson and Willmott, 2002: 620; Jenkins and Delbridge, 2014).

In sum, the literature on self-tracking and algorithmic technologies shows how control takes many shapes and may even be understood as ‘contested’ (Kellogg et al., 2020). To advance the arguments above and connect to our empirical case, we adapt the concept of technology affordances.

Technology affordances and management control

The affordances concept is widely deployed in studies of technology-in-use to analyse different meanings and kinds of action that technologies make possible or constrain (e.g. Faraj and Azad, 2012;

Leonardi et al., 2019). Affordances may refer to possible features of the object as perceived by an observer, which acknowledges how technology develops unexpected agency and is efficacious and consequential without determining action (Davis and Chouinard, 2016; Zammuto et al., 2007).² Gibson (2015) advanced the affordances concept in psychology, and it seeks to explain ‘how people and other animals orient to the objects in their world in terms of the possibilities the objects afford for action’ (Zammuto et al., 2007: 752). Within organisation studies, the importance of organisational arrangements or social ‘conditions’ (Davis and Chouinard, 2016) and relational aspects of affordances have been highlighted; affordances realise according to the ‘reciprocal relation’ between users, their roles, abilities, social relationships and the ‘material/functional bundle of the artifact’ (Faraj and Azad, 2012: 254; Elmholdt et al., 2018). Paring et al. (2017) show how an office whiteboard affords options for connecting a group of employees around a visual artifact that guides work processes and bodily performances. Affordances, however, vary amid organisational actors and become mobilised or downplayed for certain ends, which instills a political existence (Alcadipani and Islam, 2017). Alcadipani and Islam (2017) studied how the affordances of visual images were mobilised or stifled by different organisational actors; for instance, management achieved control by objectifying aspects of visual images, and employees established resistance by drawing on satirical aspects of visual images. In turn, this understanding invites us to focus not only on *what* an assumed affordance for a given object is but also *how* it is, for *whom*, and *when*, thereby providing a dynamic sensitivity towards aspects of control (Bloomfield et al., 2010; Bucher, 2018; Davis and Chouinard, 2016).

Elements of this latter focus are also important when studying how affordances operate via algorithmic technologies, which might work differently compared to non-digital artefacts (see also Bell and Vachhani, 2020). By design, algorithmic technologies make requests of the user and allow certain things to be done (Hong, 2020; Mau, 2019). When registering as a user on various social media platforms, a photo and various types of personal information (e.g. name, gender) are requested. Davis and Chouinard (2016) suggest to explicate how affordances work through interrelated mechanisms (e.g. allowing, requesting, encouraging or discouraging certain lines of action). A technology respond to the user according to what the subject want to do, and it may be experienced as *allowing* certain things to be done by design. Indeed, you can skip the photo when registering on Facebook, but a gender is required. Although allowing different lines of action, the design may also *encourage* some while *discouraging* others (Davis and Chouinard, 2016; Mau, 2019). For instance, just like small plates may *encourage* smaller portion sizes, the retweet or like button on Twitter may encourage network engagement. Similarly, a technology may also *discourage* certain kinds of action. Like gender-segregated bathrooms discourage the enacting of queer gender, the swipe function on Tinder may ‘discourage laboured consideration’ of the potential partner (Davis and Chouinard, 2016: 4). Although what is being discouraged is not determining action, the user may need to violate norms to change what is afforded by a technology. In other words, modes of coercive and normative control can be discerned through this understanding. What is perceived as allowed still depends on the user’s ability to perceive and handle the object, which in a digital environment may not only differ across occupational groups within the organisation but also involve additional ‘animate and inanimate actors’, such as system providers, devices and algorithms (Ettlinger, 2018: 3). This extended network of actors also blurs who is acting on ‘whose behalf and for what purpose’ (Bucher, 2018: 55).

In sum, the affordance lens sensitises us to the materiality of the object as well as the organisational arrangements, which also gives meaning to the objects and how roles and responsibilities are assigned.

Methodology

We leverage a qualitative case study approach (Flyvbjerg, 2006) to explore how different modes of control emerge in relation to digital self-tracking in an organisational context. Our case study takes

place in Encorp, a large international company in the energy sector headquartered in Denmark employing approximately 5,500 employees. Our selection of Encorp was information-based (Flyvbjerg, 2006). In 2016, Encorp launched a digital sleep-tracking programme among its employees to promote well-being. First seen among American companies, to the best of our knowledge this programme was the first of its kind in Scandinavia.

Empirical case

Our study was conducted in 2017. According to the Encorp HR director, the previous ‘worker culture’ in the company was less concerned with health, in terms of diet and exercise. Encorp had developed a ‘health strategy’, however, involving various initiatives and offers aimed at diet, exercise and mental health (e.g. access to a gym, presentations about diet and exercise, meatless days in the canteen). As the HR director explained: ‘private life and work life have become inseparable . . . one must look at one’s colleagues as fellow human beings’. Weight and (lack of) sleep may be symptomatic of poor health and well-being, which could jeopardise employees’ well-being and even their tenure, she explained. Encorp’s general approach was that health and well-being are an important competitive advantage. An internal survey found that 40% of the employees felt that they were not sleeping well enough. Encorp therefore decided to focus on better sleep, as it was stressed in an internal report called ‘The business of sleep: The role of sleep trackers and work-supported sleep interventions in improving physical and mental health’:

Having a workforce that participates in working life fully is of paramount importance, and organisations that are willing to engage with and address the issue of poor sleep within an organisational context will be at a competitive advantage.

As the HR director further explained, addressing sleep through sleep-trackers also provided an option for gaining insight into ‘what sleep means to people who work in one way or another; it could be people doing shift work’ and as a means for ‘helping employees improve their sleep and learning the importance of sleep for their health’. Encorp cited research finding that activity trackers could ‘promote positive health behaviours’ outside the workplace, and these insights animated an initiative whereby employees should be given wearable activity trackers to help improve sleep (internal document).

The Encorp HR department initiated its sleep programme in the autumn of 2016. The case was rather controversial and covered extensively in public media, where it was criticised for crossing work–privacy boundaries. The sleep-tracking programme was launched on the Encorp intranet as a 3-month experiment allowing employees to use a tracking device to measure sleep patterns. The interest in the programme was massive and more than 500 employees signed up, but participation was limited to 170. The participants were therefore chosen by lot while ensuring that the different departments and work functions were represented, including shift workers. Although the HR department started the programme, it was run by a researcher from a well-renowned foreign business school, who also provided consulting services. This person worked as a consultant on the programme, making presentations and providing individual, sleep-related consultancy for the employees and the company.

The digital tracking was conducted via a wearable physical activity tracker, *Jawbone Up3*, which was made by Jawbone, a San Francisco-based company. The device was given to all of the employees participating in the programme and used to track sleep and activities. Consisting of a wristband containing an accelerometer and different sensors measuring skin temperature and pulse, the *Up3* resembles other wearables from Garmin, Fitbit and Apple (Majumder et al., 2017). An algorithm converts sensor data into digital measures that work as representations of how the user

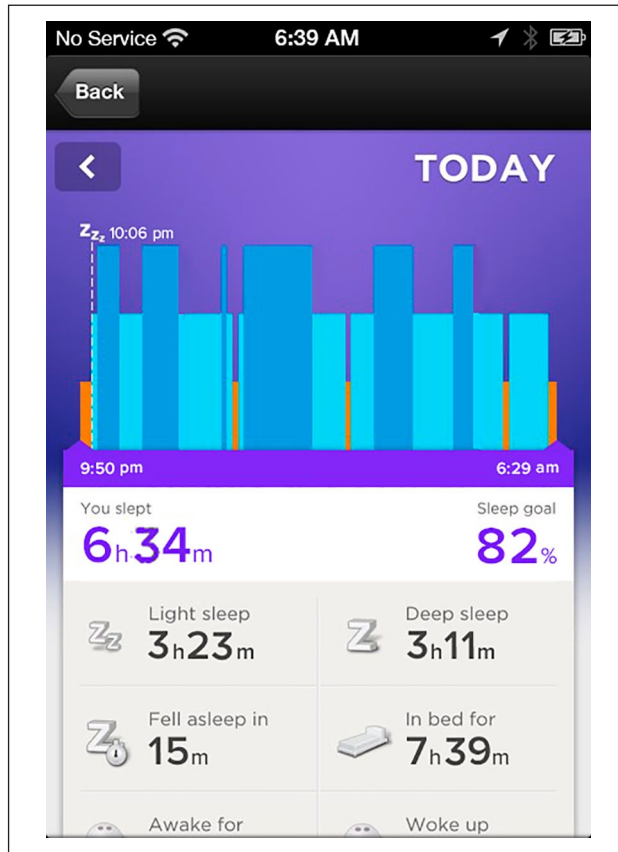


Image 1. Illustrative image used in internal report of Jawbone app (not data from participant).

sleeps and moves. These measures are then passed on to the Jawbone UP smartphone app, which turns the measures into an overview of metrics and a visualised bar chart of activities and sleep. Here, is information about REM sleep, light sleep and deep sleep provided together with information about how much time the individual was awake and how long it took them to fall asleep.

The app provides numerical indicators presenting the total sleep time and sleep percentage, which indicate how far one is from (a self-set) sleep goal (see Image 1). At the time, the Jawbone tracker was considered ‘a novel fitness-tracking wearable’, yet the ‘information on the algorithm is not publicly available’, and it has been hard to determine the precision of the metrics (Zambotti et al., 2015: 1025).

The external consultant received the primary access to the sleep data and processed and analysed the employees’ sleep measurements. The individual employee could choose if sleep data should be automatically shared or if they wanted to report their sleep manually, thereby limiting access to data. As such, the HR department did not engage directly with the data at the individual employee level. This constellation involving the HR department at Encorp, the external consultant, the Jawbone device and the individual employees was creating distributed governance, where a controlling centre was impossible to carve out. Ultimately, the utility of the tracking data was limited. The final report concluded, among other things, that the information on good sleep practices and the use of the tracking device did not in itself improve sleep. Nevertheless, the HR director

noted that fewer employees were using the private health insurance, which she considered evidence of the initiative having some impact.

Data collection

While studies of technology affordances often build on ethnographic accounts and observation studies (e.g. Leonardi et al., 2019), our study differs by being primarily interview-based. Interviews have been defended as a method for enquiring into practices and experiences of how things and materiality may afford certain options for action (Gond et al., 2018), not least from an individual perspective (Lamont and Swidler, 2014; Nicolini, 2009). Yet interviews may compromise options for observing the interaction between physical objects and employees; thus, our methodological choices also provide a boundary condition that affects our focus and adapts the affordance perspective to a focus on what lines of action the users consider digital self-tracking to allow, encourage and discourage to whom and when (Davis and Chouinard, 2016).

Interviews: 15 semi-structured interviews serve as the primary empirical source for this article. We interviewed 13 employees and conducted two interviews with the Encorp HR director (all in 2017–2018). We had familiarised ourselves with Encorp and the initiative before making contact, and the HR director facilitated our interviews with the employees who had participated in the programme, in addition to whom we decided to interview two employees who had chosen not to participate (to get their perspective on the programme). The HR director became a ‘key informant’ (Brinkmann, 2013), providing unique access to all of the programme participants, and an Encorp secretary further facilitated the contact. When sampling them, we were mindful to include both men and women of varying ages (albeit most in their 40s–50s) and from different departments to get a broad understanding of the initiative across the organisation. In our first interview round, we interviewed five employees using a semi-structured interview guide. Inspired by Charmaz and Belgrave (2012: 352), we asked open-ended, explorative questions and drew inspiration from Nicolini (2009) and the idea of ‘interviewing the double’, an interview technique that invites the interviewee ‘to imagine they have a double’ – the interviewer – who should be able to take over their task the next day (p. 196). As such, this interview technique helps to learn how people engage with technology in practice by encouraging the interviewee to unfold their everyday practice. For instance, we asked the employees to explain how a day with the device would look: ‘What would I need to know to understand the data provided by the device?’, and ‘How can I tell if I’ve slept well?’ These early interviews generally revealed many similarities. The people interviewed considered the initiative as either signalling a caring company or they voiced scepticism towards how the whole initiative had been handled. All of the authors listened to the recordings after the five interviews and took notes. The aim was to establish a general understanding of the case and to identify focus points for the second interview round. Here, we became aware of the ambiguity of the initiative, which also appeared to have implications for control.

Based on these discussions, we adjusted our interview guide slightly and then arranged another round of interviews, which allowed us to remain explorative while at the same time testing our initial findings by probing questions around control. We followed the idea of interviewing ‘as many subjects as necessary to find out what you need to know’ (Kvale and Brinkmann, 2009: 113), yet we also agreed on the advice that ‘fewer interviews that are thoroughly analysed are preferable to many interviews that are only superficially explored’ (Wolcott, 2009: 95 in Brinkmann, 2013: 59). We decided to include two non-participants in our second round to contribute to our understanding of why some people chose not to participate and to get the non-participant perspective on the initiative in general. After ten additional interviews with another eight participants and two non-participants, we felt we had obtained sufficient

information to illuminate how digital self-tracking was experienced in our case. The interviews were all conducted in Danish and transcribed verbatim, and we later translated the excerpts used in this article (Kvale and Brinkmann, 2009).

Documents and videos: In addition to our interview data, we also collected numerous documents, including internal documents from Encorp that presented the initiative and a number of press releases and descriptions of the initiative in professional magazines. We also reviewed a number of video presentations of the tracking initiative, including productions in the media as well as presentations made to the Encorp personnel. Although these data are not our main source for this article, they provide an important backdrop and secondary resource for our analysis.

Analytical approach

The analysis followed three overall phases. First, we carefully read the interview transcripts and carried out an initial coding (Charmaz and Belgrave, 2012). Here, we looked for how people ascribed meaning to the digital self-tracking and what it enabled or impeded. We found many references to how digital self-tracking made it possible to ‘see oneself’, provided ‘a visual overview’ and ‘comparable statistics’, or worked ‘as a reminder’ or ‘nudge’, which both voiced frustration (‘I’m not sure what to do with my data’) and excitement (‘I really could improve myself’). We also found that management considered it as a way to give people ‘opportunity to do something about’ bad sleep and a way of acting as a ‘responsible company’ with ‘compassion’.

In the second phase, we started scrutinising the data and engaging in a process of reinterpreting or ‘cobbling together’ our initial codes (Klag and Langley, 2013). Whereas our early phase was rather inductively driven, we turned to a more abductive reasoning in this phase (Klag and Langley, 2013; Timmermans and Tavory, 2012). As Timmermans and Tavory (2012) suggest, abduction involves ‘the cultivation of anomalous and surprising empirical findings against a background of multiple existing sociological theories and through systematic methodological analysis’ (p. 169). This allowed us to broaden our ‘toolbox’ and bring in earlier theory as a ‘disciplined imagination’ (Klag and Langley, 2013). By surveying the literature, we found that our initial codes resonated with findings in the literature on how digital technologies and algorithms afford visibility (Anteby and Chan, 2018), quantification or counting (Davies, 2019), comparison and nudges (Christin, 2020), but also opacity and disintermediation of managers (Beverungen et al., 2015; Kellogg et al., 2020).

We then started to stitch together our empirical and theoretical hunches with our focus on affordances; specifically, what the users considered the digital self-tracking to *allow* to be done by design, what was *encouraged*, and what was *discouraged* (Davis and Chouinard, 2016). We found three overall affordances, and although what is allowed, discouraged and encouraged fold into each other, we found one of the mechanisms in each affordance to be particularly revealing for the lines of action the technology afford. Firstly, we found that by providing the employees with a digital object in terms of the activity tracker (Jawbone Up3) that could follow them anywhere, HR was able to *encourage* aspirational health or behaviour at a distance (Beverungen et al., 2015). We call this affordance *managing health remotely*. Secondly, we found that the ability of the technology to turn sensor signals into numbers, to count, compare and produce visual bar charts afforded *body visibility* to the employees. One group of employees considered this visibility to *allow* and maybe even encourage changes in private lifestyle, thereby helping them to gain self-control. Thirdly and in contrast to the former, another group of employees considered only a faint allowance to use the body visibility to change behaviour. Rather, they considered the digital self-tracking to afford *opacity* (Kellogg et al., 2020) and provide uncertain knowledge, which *discouraged* addressing the organisation with issues of sleep and health, hence, invoking a feeling of lost control (see Table 1).

Table 1. Empirical evidence of constructs.

Affordance	Line of action	Illustrative quotes
Managing health remotely	Encourage employees to make private lifestyle changes and aspire to certain health ideals to optimise sleep.	<ol style="list-style-type: none"> 1. 'You're responsible as an employer. If you see an employee go over the edge – either she dies or I have to fire her – then I think if you have a trusting relationship etc., then I really think you have to intervene. To say, 'This situation is affecting your performance and it affects your life in general. We have to do something' [. . .] I think that one must look at one's colleagues as fellow human beings'. (HR director) 2. 'I feel that the company uses this knowledge [about sleep] positively, because they really want what's best for us [. . .] We can call some professionals, which the company pays for; we can talk to them about sleep or losing weight [. . .] They do this because they want us all to be healthy, to live a long life and to make sure we're good when we're in this company'. (Mary, employee) 3. 'By providing the devices and offering courses and coaching on how to use the trackers and handle poor sleep, we give employees opportunity to take care of their own health'. (HR director)
Body visibility	Allow counting, comparison, and nudging for sleep-optimisation.	<ol style="list-style-type: none"> 1. 'I made notes if I was watching TV before going to bed. . . I actually wrote down when I watched . . . I could then check the Jawbone and see that I had difficulty falling asleep – and when I fell asleep, I could see that my deep sleep was significantly shortened . . . The app also provides tips once in a while based on my sleeping – related to bedtimes or suggestions for when to get up'. (Peter, employee) 2. 'Usually I compare my sleep scores throughout the week to see if I've slept well. If I suddenly have a bad sleep score, for instance, it might be 65%, then I might look at what happened that day – is there an explanation? Maybe a party or something'. (Beth, employee) 3. 'You can also get statistics for a longer period. . . You can play with it. . . And then you can try to compare with when I drank coffee yesterday and what I did. . . So you can learn from it' (Ann, employee)
Opacity	Discourage addressing the organisation of work with issues of sleep	<ol style="list-style-type: none"> 1. 'I've struggled to make this work. . . It isn't really something we talk about at work, and I'm not sure how my manager would even respond to it'. (Michelle, employee) 2. 'I'd love to sleep better! But how does it help if I'm on a project where they bomb me all the time and expect me to be available at 10 in the evening. It's difficult to slow the pace – I also have to get the kids to bed and prepare myself for the next day. (Niels, employee) 3. 'I found out I sleep less than I thought, and I've been puzzled about what to do with it. . . I've had this feeling of being alone with my data'. (Andrea, employee)

Findings

Our analysis is divided into three sections that highlight the affordances provided by Encorp's digital self-tracking programme. Firstly, we focus on how digital self-tracking enabled management to

assume responsibility for employee health by ‘managing health remotely’; second, we focus on how employees were gaining self-control through body visibility; and, thirdly, we focus on how the digital self-tracking also afforded opacity and a feeling of lost control.

Managing health remotely

Encorp highlighted the programme as a cutting-edge initiative aimed at employee well-being. According to the HR director, this initiative contained a two-sided act of responsibility: The company was acting morally responsibly towards its employees while at the same time soliciting self-responsibility from the employees:

Setting up your private life and work life is an individual responsibility, and we can't take responsibility for whether you sleep well. But we can take responsibility for giving you opportunity to do something about it. (Interview, HR director)

Accordingly, the sleep-tracking programme was to be considered an ‘opportunity’ provided to the employee to take care of their own health. The digital device was critical in this regard; as well as affording a means to help employees manage their sleep, it also materialised a managerial strategic agenda of being a healthy, responsible employee. Hence, the digital device and data were presented as a means for the HR department to solicit the employee and act as a responsible company, while encouraging employees to take responsibility for improving their health and sleep – from a distance. Although employee sleep and well-being were considered a company matter, privacy, ‘managerial remoteness’ and the importance of self-control were emphasised:

The company is really responsible, but the more private part primarily stays with the employee himself. . . what employees do with their data is a personal matter . . . what a person wants to do with it is their own responsibility. (HR director)

The emphasis on employees’ ‘own responsibility’ was crucial to the initiative; it was not to be considered control of a coercive nature but rather amplifying aspirational values in ways that assumed to align the company interest with employee interests (Jenkins and Delbridge, 2014).

Further along these lines, an important aspect was to sensitise the employees or make the affordances of digital self-tracking data present to the employees. Hence, to help the employees sort out and respond to the data, Encorp offered advice and material on ‘sleep hygiene practices’ in presentations, webinars, and in seminars with an international sleep expert. These events contained references to scientific evidence (references to peer-reviewed clinical journal articles). It was argued that a healthy individual should sleep between ‘seven to nine hours per night on a regular basis to promote health and well-being’, and employees were introduced to notions of ‘sleep duration’, ‘light and deep sleep’, ‘REM sleep’ and ‘number of awakenings’ in the app (internal document). Sleep-damaging habits were also dealt with, such as, ‘drinking coffee after 2 pm’, not having a regular or ‘fixed’ bedtime each night, or ‘looking at screens before bedtime’ (e.g. watching television or using one’s smartphone). Coaching from an external consultancy via telephone was also offered to the employees to understand their data and how to improve it. All of the information provided by the app and the various activities focused on aspects of the employee’s private lifestyle (i.e. not directly related to work), such as coffee, exercise, liquids and bedtime, which excluded work-related issues, such as tight deadlines or shifting working hours. The fact that the Jawbone technology was developed outside the context of work meant that the app, by design, encouraged people to count and compare (Davies, 2019), as we explore below in greater detail. This aspect was further strengthened through the training activities,

which was well received, and employees responded positively to this advice (regarding e.g. sleep time, coffee, exercise):

They [the seminars] were very informative. I don't drink coffee in the evening anymore. It's simply a consequence of that and . . . well, we've also become very aware of the issues with screens. And it's also because we've talked so much about sleep. You shouldn't be disturbed [when sleeping]. (Interview, Ann, employee)

The employees voiced their commitment to the advice and the overall value of the initiative. They viewed the programme as being consistent with the image of a caring company that, through health insurance and, for example, sleeping arrangements, encourage awareness of sleep problems and other health-related issues. Put differently, the advice worked as a way of sensitising the employees to the affordances of self-tracking and developing practices to not only interpret but also 'manage data' (Lupton, 2018: 5), for instance by changing habits or establishing new 'sleep hygiene practices'. Like the HR director, the employees did not see any 'loss of autonomy' or mismatch between interests; the employees and management appeared to share the same interests and were in this together (Barley and Kunda, 1992). Indeed, the employees suggested that the programme provided a legitimate win-win situation: 'you get a higher quality of life, and the company gains from less absence and greater productivity when you're at work' (interview, Beth). As such, by encouraging digital self-tracking as a way of taking care of health and well-being, Encorp managed to 'ensure that the' self-tracking was 'unobtrusive' (Zuboff, 2019: 234) and that their interests were aligned (Costas and Kärreman, 2013).

Gaining self-control via body visibility

I thought it would be nice to improve your sleep quality one way or another – so you might sleep less but be better rested. (Ann, employee)

As the introductory quote illustrates, employees experienced the digital self-tracking as a tool that allowed them to track themselves, to gain control and to maximise their sleep quality. By providing options for counting, comparison and nudging, employees emphasised how the digital self-tracking afforded body visibility and allowed lines of action for managing their sleep better. A new self-knowledge was developing:

I wear the bracelet all the time [. . .] it tells me about waking periods, deep sleep, light sleep, and how much REM sleep I get – it visualises the different sleep stages and how long they last. (Interview, Beth, employee)

I'm really diving into the data. I can see how I'm doing through the numbers. . . Also, my resting pulse . . . how to be as close to the optimal resting pulse as you can get. . . the resting heart rate just before waking up should be low, so I also watched how far the pulse went up and down. (Interview, Dan, employee)

The algorithms making sense of the sensor data and turning it into digital data allow employees to 'see' their bodies in a new way and the metrics and visual overview provided an obligation to a new form of body-awareness in relation to their sleep:

All of a sudden, things changed. I went from being in an unknowing position – maybe I slept, maybe I didn't sleep – I didn't really know. Now, it was suddenly something that was tracked and I could see it (Interview, Tabita, employee)

Besides counting and visualising the numbers, the app also rendered sleep qualitatively comparable. Employees should set a sleep goal, and besides the advice from the Encorp seminars, the app also provided a 'Did you know?' function notifying how much a person (within the system) of a certain age on average sleeps and moves each day and how much is recommended. For instance, according to the app, a 36-year-old male on average takes 7699 steps a day and sleeps 6 hours and 47 minutes nightly. The app recommends eight hours of sleep and 10,000 steps each day, which is consistent with the advice provided at the Encorp seminars. Employees reported how the comparative affordance of the Jawbone UP app enabled aspirational commitments for how to handle poor sleep:

You can also get statistics for a longer period . . . You can play with it. . . And then you can try to compare with when I drank coffee yesterday and what I did. . . So you can learn from it . . . for example, if you've been out drinking on a Friday night, you can see that you don't really get down and sleep the same deep sleep. . . you sleep more restlessly. (Interview, Ann, employee)

As Ann mentions, the sleep data could be used for comparisons; both against one's own prior data and with colleagues: 'In informal settings, we've drawn inspiration from each other, we've discussed how the changes we've made have affected us'. Ann argued that using the app and the data was intriguing and motivating. The emphasis on the playful elements of the self-tracking generally appeared to draw employee attention away from matters of control (Fleming and Sturdy, 2011).

Employees also spoke of the tracking as being able to 'nudge' them into aspirational behaviour. The tracking ability allowed (or even encouraged) employees to optimise sleep and perform better self-control by reminding them how to behave. The Jawbone 'smart coach' feature provides running advice based on patterns in the individual's data. For instance, it could tell that their prior data showed that extra bedtime correlated with additional physical activity (steps), thereby suggesting that they should aim for an earlier bedtime. As Karen noted:

Now, I can manage myself completely. I can say 'OK, I'll have to get up there and I need 10 minutes to settle down'. OK – then I have to go to bed at that exact time. That's what I wanted to get out of it [. . .] I know what it takes, but when your brain is just moving on with other stuff, then I'll put myself aside and I don't get my night's sleep. (Interview, Karen, employee)

Similarly, Peter argued that:

I've changed my habits. . . I've always considered lack of sleep something I could handle, but now it starts to mean something. . . I'm saying to myself 'look at what you have to do tomorrow' – to make sure I'm well rested. (Interview, Peter, employee)

This 'datafication' of the self (Lupton, 2016a) engaged the employees and afforded a nudge by providing actionable knowledge. Indeed, a kind of rational self-control is at stake here, where numbers can be calculated, compared and analysed to control individual behaviour. As Karen explained, she now 'knows what it takes'. Digital self-tracking thus enabled counting, comparison and nudging, which, according to the employees, heightened body visibility and allowed them to gain self-control. In summary, one might say that the acquired self-knowledge transformed into 'people's behaviours and sense of self' (Lupton, 2016a: 9), becoming a 'responsibility for outcomes of their lives' (Lupton, 2016a: 39). The kind of self-control taking place was consistent with the Encorp values (Barley and Kunda, 1992), and the digital self-tracking offered a way of making these values 'stick to their targets' – the employees (Alvesson and Willmott,

2002: 628) – which makes management influential via the self-controlling employee (Ivanova and Von Scheve, 2019). However, while the newly acquired self-knowledge enabled the company to ‘remotely control’ its employees while affording employees increased self-control, the digital self-tracking project also left some employees struggling. While those employees who reported increased self-control considered the encouragement from HR to support this, other employees considered the remote management- and self-controlling affordances to coalesce, affording opacity and a sense of lost control.

Affordance opacity and lost control

As noted above, some of the employees struggled to use the data, expressing concerns regarding the possible implications of the self-tracking data. Indeed, some found that the data evoked frustration and worry due to a lack of clarity. Could records of inappropriate sleep patterns lead to sanctions? And how could poor sleep be addressed in the workplace? One employee, Andrea, shared her thoughts:

I discovered I sleep less than I thought. . . . When I first saw my sleep graphs and how badly I slept, I remember being hit by this feeling, ‘shit – what if the company finds out?’ Will they be able to see that I’ve had heart problems? How will they respond? (Interview, Andrea, employee)

While Andrea considered the digital data to provide a credible representation of his sleep, the increased body visibility and new knowledgeable position was not merely a ‘nudge’ but rather creating frustration and a sense of lost control. Andrea had previously struggled with health issues, and it was unclear how these problems could be handled within the immediate affordances of the programme. On the one hand, HR had pushed the programme and was targeting them as employees; on the other, the data was left to the employees. Ultimately, nothing happened: The employees may have gained new knowledge about themselves, but as Andrea later described, this invoked a feeling of being ‘alone with my data’ (Andrea, interview) without really knowing how to respond. The remote management and body visibility afforded by the tracking created an ambiguous space for Andrea where making the organisation responsible (or even engaging HR in health-related issues) was considered discouraged. Similar to Andrea, another employee, Michelle, had a number of concerns about letting anyone know about her bad sleep and was wondering if she should try to hide her data:

Should I be honest? Should I answer something else? What happens if I’m honest? Will there be a lot going on? What’s going to happen? I chose to be honest, but nothing happened. (Michelle, interview)

Michelle had a busy work-life and had struggled with stress. With slight disappointment, she noticed ‘nothing happened’. The quotes from Andrea and Michelle demonstrate how the self-tracking also created ambivalence and insecurity when employees lacked the ability to use the recommendations in response to the issues with which they were struggling. By giving access to their sleep data, they voiced expectations that the company would assume responsibility in new ways. But they found that considering poor sleep to be a matter for the organisation of work was discouraged; instead, the focus was on screen time, caffeine and exercise, which did not. Neither Andrea nor Michelle considered any options for taking their struggles further; rather, ‘hierarchical ambiguity’ (Ekman, 2014) suddenly became visible when saying ‘what happens’ or asking ‘how will they [management] respond?’ Similarly, as another employee who chose not to participate in the programme commented:

I'd love to sleep better! But how does it help if I'm on a project where they bomb me all the time and expect me to be available at 10 in the evening. It's difficult to slow the pace – I also have to get the kids to bed and prepare myself for the next day. (Niels, employee)

The quote illustrates how while the app may encourage certain lines of action, other lines of action might be pulling harder. In an odd way, management actually became absent despite their presence in pushing the tracking. The digital self-tracking possibly invoked body visibility to the employees, but their frustrations remained invisible to management. This echoes what Lupton (2016a) describes as the flipside of self-tracking: a sense of 'lost control' and frustration about what to do with one's data. We suggest that this feeling relates to the opacity of the affordances, as illustrated by the quotes from Andrea, Michelle and Niels. This argument resonates with the relational and relative components of technology affordances. Technology affordances vary according to the observer and their abilities and context. Being able to pursue certain lines of action and to consider certain affordances often requires concerted effort (Bloomfield et al., 2010; Davis and Chouinard, 2016). Gibson (2015: 130) gives the example of how a mail box is considered to afford letter-mailing: '[T]he real postbox (the only one) affords letter-mailing to a letter-writing human in a community with a postal system' (p. 130). Related to the Encorp case, if the organisational arrangements do not allow (or encourage) the employee to pursue a desired line of action, and to address bad sleep or health in the organisation of work, if that is relevant, then the technology affordance becomes opaque or unclear. In our case, the employees experiencing a loss of control were able to make their body visible through counting and comparison, yet there was no community with a system for picking up (problematic) data.

Discussion

In this article, we have analysed the kinds of control made possible by digital self-tracking in Encorp. Algorithmic technologies like digital self-tracking may be considered to produce options for managing through data, and the ability to monitor employees is often pointed out (Bader and Kaiser, 2019; Kellogg et al., 2020; Manley and Williams, 2019). While these technologies may be considered to promote a highly rational mode of control, it is also considered a self-disciplinary and normative kind of control (Moore and Robinson, 2016). Our case shows how digital self-tracking is used to address employee well-being and does so by soliciting the employees via a softened mode of management. By doing so, different kinds of control blend together and control becomes ambiguous. We propose that these findings make three related but distinct theoretical contributions in relation to the literatures on, respectively, algorithmic control, aspirational control and the politics of digital self-tracking.

The ambiguity of algorithmic control

Studies of algorithmic technologies and technologies of datafication have stressed how these technologies transform what we may think to be controllable and manageable (Hong, 2020; Kellogg et al., 2020). Algorithmic technologies have been argued to enable management to watch over employees in new (Anteby and Chan, 2018; Kellogg et al., 2020; Manley and Williams, 2019), more discrete and subtle ways (Beverungen et al., 2015; Kellogg et al., 2020: 20), and studies of digital self-tracking have noted how this enables users to take control over their own lives (Lupton, 2016b; Moya and Pallud, 2020). By studying digital self-tracking in Encorp, our study brings together and nuances these arguments, pointing out the ambiguity of the knowledge produced through algorithmic technologies and how malleable these technologies are.

In our case, the ability for the digital self-tracking to afford self-control varies across the employees and the fact that management refrains from direct contact with the employees; operating instead at a technologically mediated distance, meaning that employees must digest the knowledge themselves. Those employees who consider digital self-tracking to afford self-control highlight the empowerment and downplay aspects of managerial control. In contrast, the employees who are struggling with the data highlight the affordance opacity of digital self-tracking and start considering the kinds of control that might (not) be at stake. Whereas opacity has been stressed as an affordance to algorithmic technologies at work (Kellogg et al., 2020), we suggest that this opacity encourages that which Hong (2020: 56) calls ‘forms of speculation’, which may be of a more paranoid or conspiratorial nature. The employees might find themselves located in multiple interconnected networks of control (Davies, 2019; Manley and Williams, 2019), and they may know themselves in new ways, but the distance to management that Jawbone mediates can make it difficult to tell who and what ‘knows on my behalf and how much say do I have’ (Hong, 2020: 57). Indeed, what is made visible and what remains invisible is also at stake in our case. Whereas the employees who gain self-control consider management to be aligned with their agenda, the group experiencing a sense of lost control starts speculating about control: What does management want and know? What happens to my data?

Our analysis indicates that the algorithmic opacity described by Kellogg et al. (2020) may not only make employees speculate but also at times perplex management. The HR department is perplexed by the data from the digital self-tracking and struggles to connect the data to contextual parameters (e.g. changing worktimes), and thenceforth veer away from further interventions:

I had hoped that the conclusions would be so clear that you could say ‘sleep means this. . .’ to people who work in one way or another: it could be shifting or something else [. . .] But I just think that the conclusions became so, like a little diluted, so we didn’t get anything we could really use. . . So we haven’t communicated much afterwards. (HR director, Interview)

Our case thus reveals a lack of unified, straightforward control or influence, which nuances prior understandings that have pointed out how employees struggle to hide their bodies or to become ‘invisible’ to management (Anteby and Chan, 2018; Flyverbom, 2019; Manley and Williams, 2019). In our case, employees rather indicate an undetermined visibility and invisibility to management. The lack of managerial response invokes a complex and contested space of autonomy and control or empowerment/disempowerment among the employees without any panoptic overlord. This marks an important difference to centralised modes of control and explains some of the frustration voiced in our case, where some employees find it hard to manage their body (in)visibility in relation to management (Anteby and Chan, 2018; Lewis and Simpson, 2012). Consistent with Kellogg et al. (2020), we may further speculate that this ambiguity of algorithmic control also confirms an interplay and inseparability of normative and rational modes of control, which reinforce each other.

Algorithmic technologies and aspirational control

Secondly, our study also contributes to the literature on how aspirational ideals and values commit employees to the organisation and work as a mode of control (Costas and Kärreman, 2013; Jenkins and Delbridge, 2014; Toraldo et al., 2019). Prior studies have highlighted how management addresses employees’ ‘insides’ or their ‘hopes, fears and aspirations’ (Alvesson and Willmott, 2002: 620), and how aspirational ideals communicated via employee well-being and health initiatives may link an employee’s aspirational identity to the organisation or seek to align ‘lifestyle aspirations’ to the organisation (Costas and Kärreman, 2013: 411). Studies have stressed both the

discursive nature of this kind of control (Alvesson and Willmott, 2002; Costas and Kärreman, 2013) and, more recently, also pointed out how other material modalities afford critical options for control and influence (Alcadipani and Islam, 2017; Paring et al., 2017). However, these studies do not consider how the algorithmic nature or different materiality of digital self-tracking may alter the affordances and options for control (see also Bell and Vachhani, 2020).

Consistent with prior studies of aspirational control, our study shows how Encorp solicits its employees in a manner that appears to align their interests with those of the employees, where the employees, although not finding the same affordances of the digital self-tracking, generally comply with the aspirations regarding good sleep and Encorp's intentions (Alvesson and Willmott, 2002; Costas and Kärreman, 2013). Put differently, the employee may aspire to a healthy identity that aligns with Encorp's healthy aspirations. Our case also advances these prior studies, however, as it shows how the organisational discourse concerning health and well-being is passed on to the employees through digital self-tracking. Our study reveals how the affordances of digital self-tracking extend the normative control by making the discursive ideal an embodied experience for the employee, thereby linking discourse to matter. Nevertheless, we suggest that by doing so the employee does not merely comply with 'externally-binding' organisational norms but that they also worry about complying with instant, body-related data points (Davies, 2019: 530). Thenceforth, digital self-tracking may provide opportunities for normative control that are both invoking and tying the employees' aspirations to the organisation (Costas and Kärreman, 2013; Paring et al., 2017), where management operates from a mediated distance (Hong, 2020). In other words, the norms are not just set by the organisation (or society) and followed by the employee; the metrics provided via the digital self-tracking also provide new norms or data points to follow, hence, normativity cuts multiple ways.

The fact that HR was operating from a distance possibly also explains part of the undetermined space of autonomy and control, as described above. As our analysis suggests, one group of employees did consider the outcome from digital self-tracking to afford body visibility and an option for controlling themselves, thus committing to the initiative. Yet another group of employees was more sceptical and stressed the affordance opacity and lost control. This finding resonates with work on normative control, which stresses how the employees' sense of agency and the ability to remain 'autonomous' is important for engaging with organisational values (Jenkins and Delbridge, 2014: 884), indeed, a lack of ability to respond may affect silence and frustration (see also Dar and Ibrahim, 2019). As our case shows, however, in relation to digital self-tracking, this discretionary control is not only in relation to organisational values but also in relation to the ability to shape action through the body visibilities afforded by the tracking.

The politics of digital self-tracking

Through our focus on the affordances of digital self-tracking, our study also contributes to discussions about the politics of digital self-tracking in the workplace (Moore and Robinson, 2016). Digital self-tracking has been considered an inevitable extension of a neoliberal ideology (Cederström and Spicer, 2015; Charitsis, 2016; Moore and Robinson, 2016) but also a softer, subtler 'kind of biopolitics' that operates from a distance (Hong, 2020: 176). If we understand politics as 'ways of world-making' (Bucher, 2018: 3), it involves considering what is included and excluded in the organising process (Bencherki and Elmholtz, 2020), what kinds of action are encouraged, discouraged and allowed through the ways that affordances are mobilised (Alcadipani and Islam, 2017; Davis and Chouinard, 2016), and how rights and responsibilities are distributed (Hong, 2020). Indeed, as various studies have argued, technologies have politics by design, but the affordances of these designs may be mobilised very differently (Alcadipani and Islam, 2017; Joerges, 1999).

The Encorp HR department probably did not consider the digital self-tracking initiative to involve the kind of politics described above. HR was considering the initiative as a matter of corporate responsibility, but was puzzled by the results and unable to connect with the employees who were struggling. We observed how responsibility for poor sleep is delegated to the employees. By training the employees to pay attention to so-called ‘sleep hygiene practices’, Encorp mobilised certain lines of action through digital self-tracking. Following Davis and Chouinard (2016), we may say that employees are discouraged from considering sleep-related issues as related to the organisation of work and encouraged to focus on changing their private lifestyle. Put differently, a kind of ‘expanding and narrowing of options’ is at stake (Mau, 2019: 171). As such, the responsibility to achieve the ideal status of being healthy and well-rested is delegated towards the employee. The employees who consider self-tracking to enable self-control do not view this as a problem; however, those who highlight affordance opacity and lost control describe being left on their own with their numbers (see also McCabe, 2016). As Michelle observed in our case: ‘nothing happened’ when she revealed her bad sleep numbers; thus, she may consider herself a kind of ‘responsibility sponge’ for HR. This latter aspect resonates with the individualised, precarious and anxious employee, which Moore and Robinson (2016) describe as an effect of the increasing quantification of workers through digital self-tracking devices and a neoliberal ideology.

Our case, however, cautions against reducing digital self-tracking to neoliberal politics; or, as Hong (2020: 177) notes, ‘the harbinger of unhappy, alienated subjects constantly torn between the expectations of quantified optimisation and the uncanniness of their own experience’. Indeed, the employees who consider the tracking to afford rational self-control are not experiencing anxiety and precariousness. This finding encourages us to consider how digital self-tracking may also provide options for some of the employees to make lifestyle changes and maybe also discretely start to reorder the organisation of work despite neoliberalism (see also Ash, 2017). Moreover, as our case illustrates, employees may also escape control through the malleable and uncertain nature of algorithmic knowledge (Hong, 2020), revealing how digital self-tracking should not be reduced to subtle control cloaked as empowerment. We may speculate that a managerial- or control void also emerges in the use of digital self-tracking.

Concluding remarks

We started the article by asking what kinds of control digital self-tracking in the workplace makes possible, and our analysis helps to answer this question. The analysis shows how digital self-tracking had different kinds of affordances, which we call managing health remotely, body visibility and opacity. We suggest that these affordances allow or en-/discourage different kinds of action, but also exist alongside each other and create an undetermined space of autonomy and control. This illustrates, we argue, how digital self-tracking works through ambiguous kinds of control, targeting both normative aspirations and an individuated discretionary control. We further show how these affordances may invoke a sense of self-control but also a sense of lost control or a control void, which impedes action. By pointing at this, we are able to illustrate (the limits of) the kinds of control possible via digital self-tracking.

We do not imagine our study to be exhaustive of how digital self-tracking functions (Lupton, 2016b). Our study contains an early, empirically based theorisation of the use of digital self-tracking technologies in the workplace, and it indicates a need to elaborate further on their use (Moore et al., 2018). Future studies could therefore extend our analysis of how digital self-tracking matters to management in shaping employee identity and behaviour, and how alternative organisational politics can be possible through digital self-tracking and algorithmic technologies. This involves engaging with how these technologies not only allow new forms of control but also new limits of control.

Acknowledgement

We thank our editors and the three anonymous reviewers. Moreover, we wish to thank Rasmus Hoffman Birk for providing helpful comments on prior versions of the manuscript. We also benefitted from presenting an earlier version of the paper at the 2019 Annual Meeting of the Academy of Management in Boston, MA.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Kasper Trolle Elmholt  <https://orcid.org/0000-0002-0325-5266>

Notes

1. The company name is anonymised.
2. Gibson (2015: 126) provides the example of a stone as missile or brick, depending on the abilities of the user.

References

- Alcadipani, R. and Islam, G. (2017) 'Modalities of Opposition: Control and Resistance via Visual Materiality', *Organization* 24(6): 866–91.
- Alvesson, M. and Willmott, H. (2002) 'Identity Regulation as Organizational Control: Producing the Appropriate Individual', *Journal of Management Studies* 39(5): 619–44.
- Anteby, M. and Chan, C. K. (2018) A Self-Fulfilling Cycle of Coercive Surveillance: Workers' Invisibility Practices and Managerial Justification', *Organization Science* 29(2): 247–63.
- Ash, J. (2017) *Phase Media: Space, Time and the Politics of Smart Objects*. London: Bloomsbury Publishing.
- Bader, V. and Kaiser, S. (2019) 'Algorithmic Decision-Making? The User Interface and Its Role for Human Involvement in Decisions Supported by Artificial Intelligence', *Organization* 26(5): 655–72.
- Barley, S. R. and Kunda, G. (1992) 'Design and Devotion: Surges of Rational and Normative Ideologies of Control in Managerial Discourse', *Administrative Science Quarterly* 37(3): 363–99.
- Barnes, C. M., Lucianetti, L., Bhave, D. P., et al. (2015) "'You Wouldn't Like Me When I'm Sleepy': Leaders' Sleep, Daily Abusive Supervision, and Work Unit Engagement', *Academy of Management Journal* 58(5): 1419–37.
- Bell, E. and Vachhani, S. J. (2020) 'Relational Encounters and Vital Materiality in the Practice of Craft Work', *Organization Studies* 41(5): 681–701.
- Bencherki, N. and Trolle Elmholt, K. (2020) The Organization's Synaptic Mode of Existence: How a Hospital Merger is Many Things at Once, *Organization*. Published online before print October 8, doi: 10.1177/1350508420962025
- Beverungen, A., Beyes, T. and Conrad, L. (2019) 'The Organizational Powers of (Digital) Media', *Organization* 26(5): 621–35.
- Beverungen, A., Böhm, S. and Land, C. (2015) 'Free Labour, Social Media, Management: Challenging Marxist Organization Studies', *Organization Studies* 36(4): 473–89.
- Bloomfield, B. P., Latham, Y. and Vurdubakis, T. (2010) 'Bodies, Technologies and Action Possibilities: When Is an Affordance?', *Sociology* 44(3): 415–33.
- Brinkmann, S. (2013) *Qualitative Interviewing*. Oxford: Oxford University Press.
- Bucher, T. (2018) *If . . . Then: Algorithmic Power and Politics*. Oxford: Oxford University Press.
- Calvo, R. A. and Peters, D. (2014) *Positive Computing: Technology for Wellbeing and Human Potential*. Cambridge, MA: The MIT Press.
- Cederström, C. and Spicer, A. (2015) *The Wellness Syndrome*. Cambridge: Polity Press.
- Charitsis, V. (2016) 'Prosuming (the) Self', *Ephemera: Theory and Politics in Organization* 16(3): 37–59.

- Charmaz, K. and Belgrave, L. (2012) 'Qualitative Interviewing and Grounded Theory Analysis', in J. F. Gubrium, J. A. Holstein, A. B. Marvasti, et al. (eds) *The SAGE Handbook of Interview Research: The Complexity of the Craft*. 2nd ed, pp. 347–65. Thousand Oaks, CA: SAGE.
- Christin, A. (2020) 'What Data Can Do: A Typology of Mechanisms', *International Journal of Communication* 14: 1115–34.
- Costas, J. and Kärreman, D. (2013) 'Conscience as Control—Managing Employees through CSR', *Organization* 20(3): 394–415.
- Curchod, C., Patriotta, G., Cohen, L., et al. (2019) 'Working for an Algorithm: Power Asymmetries and Agency in Online Work Settings', *Administrative Science Quarterly* 65(3): 644–76.
- Dar, S. and Ibrahim, Y. (2019) 'The Blackened Body and White Governmentality: Managing the UK Academy and the Production of Shame', *Gender, Work and Organization* 26(9): 1241–54.
- Davies, W. (2019) 'The Political Economy of Pulse: Techno-Somatic Rhythm and Real-Time Data', *Ephemera* 18(4): 513–536.
- Davis, J. L. and Chouinard, J. B. (2016) 'Theorizing Affordances: From Request to Refuse', *Bulletin of Science, Technology & Society* 36(4): 241–8.
- Dudhwala, F. and Larsen, L. B. (2019) 'Recalibration in Counting and Accounting Practices: Dealing with Algorithmic Output in Public and Private', *Big Data & Society*. Published online before print July 17, doi: 10.1177/2053951719858751.
- Ekman, S. (2014) 'Is the High-Involvement Worker Precarious or Opportunistic? Hierarchical Ambiguities in Late Capitalism', *Organization* 21(2): 141–58.
- Elmholdt, K. T., Clausen, R. T. J., and Madsen, M. T. (2018) 'Seductive Atmospheres: Using Tools to Effectuate Spaces for Leadership Development', *Journal of Change Management* 18(4): 257–280.
- Ettlinger, N. (2018) 'Algorithmic Affordances for Productive Resistance', *Big Data & Society*. Published online before print April 25, doi: 10.1177/2053951718771399.
- Faraj, S. and Azad, B. (2012) 'The Materiality of Technology: An Affordance Perspective', in P. Leonardi, B. Nardi and J. Kallinikos (eds) *Materiality and Organizing: Social Interaction in a Technological World*, pp. 237–58. Oxford: Oxford University Press.
- Faraj, S., Pachidi, S. and Sayegh, K. (2018) 'Working and Organizing in the Age of the Learning Algorithm', *Information and Organization* 28(1): 62–70.
- Fleming, P. and Sturdy, A. (2011) 'Being Yourself' in the Electronic Sweatshop: New Forms of Normative Control', *Human Relations* 64(2): 177–200.
- Flyvbjerg, B. (2006) 'Five Misunderstandings About Case-Study Research', *Qualitative Inquiry* 12(2): 219–45.
- Flyverbom, M. (2019) *The Digital Prism*. Cambridge: Cambridge University Press.
- Galloway, A. R. (2004) *Protocol: How Control Exists After Decentralization*. Cambridge, MA: The MIT Press.
- Gibson, J. J. (2015) *The Ecological Approach to Visual Perception: Classic Edition*. New York, NY: Psychology Press.
- Gond, J. P., Cabantous, L. and Krikorian, F. (2018) 'How Do Things Become Strategic? "Strategifying" Corporate Social Responsibility', *Strategic Organization* 16(3): 241–72.
- Hayles, N. K. (2017) *Unthought: The Power of the Cognitive Nonconscious*. Chicago, IL: University of Chicago Press.
- Hong, S. H. (2020) *Technologies of Speculation: The Limits of Knowledge in a Data-Driven Society*. New York: New York University Press.
- Ivanova, M. and Von Scheve, C. (2019) 'Power Through Empowerment? The Managerial Discourse on Employee Empowerment', *Organization* 27(6): 777–96.
- Jenkins, S. and Delbridge, R. (2014) 'In Pursuit of Happiness: A Sociological Examination of Employee Identifications Amongst a 'Happy' Call-Centre Workforce', *Organization* 21(6): 867–87.
- Jenkins, S. and Delbridge, R. (2017) 'Neo-Normative Control and Value Discretion in Interactive Service Work: A Case Study', in S. P. Vallas (ed.) *Emerging Conceptions of Work, Management and the Labor Market* (Research in the Sociology of Work, vol. 30), pp. 59–85. Bingley: Emerald Publishing Limited.

- Joerges, B. (1999) 'Do Politics Have Artefacts', *Social Studies of Science* 29(3): 411–31.
- Kellogg, K. C., Valentine, M. A. and Christin, A. (2020) 'Algorithms at Work: The New Contested Terrain of Control', *Academy of Management Annals* 14(1): 366–410.
- Klag, M. and Langley, A. (2013) 'Approaching the Conceptual Leap in Qualitative Research', *International Journal of Management Reviews* 15(2): 149–66.
- Kvale, S. and Brinkmann, S. (2009) *Interview: Introduktion til et håndværk*. Copenhagen: Hans Reitzel.
- Lamont, M. and Swidler, A. (2014) 'Methodological Pluralism and the Possibilities and Limits of Interviewing', *Qualitative Sociology* 37(2): 153–71.
- Leonardi, P. M., Bailey, D. E. and Pierce, C. S. (2019) 'The Coevolution of Objects and Boundaries Over Time: Materiality, Affordances, and Boundary Salience', *Information Systems Research* 30(2): 665–86.
- Lewis, P. and Simpson, R. (2012) 'Kanter Revisited: Gender, Power and (In) Visibility', *International Journal of Management Reviews* 14(2): 141–58.
- Lupton, D. (2016a) *The Quantified Self: A Sociology of Self-Tracking*. Cambridge: Polity Press.
- Lupton, D. (2016b) 'The Diverse Domains of Quantified Selves: Self-Tracking Modes and Dataveillance', *Economy and Society* 45(1): 101–22.
- Lupton, D. (2018) 'How Do Data Come to Matter? Living and Becoming with Personal Data', *Big Data & Society*. Published online before print July 5, doi: 10.1177/2053951718786314.
- Majumder, S., Mondal, T. and Deen, M. J. (2017) 'Wearable Sensors for Remote Health Monitoring', *Sensors* 17(1): 130.
- Manley, A. and Williams, S. (2019) 'We're Not Run on Numbers, We're People, We're Emotional People': Exploring the Experiences and Lived Consequences of Emerging Technologies, Organizational Surveillance and Control among Elite Professionals', *Organization*. Published online before print December 6, doi: 10.1177/1350508419890078.
- Mann, S. and Ferenbok, J. (2013) 'New Media and the Power Politics of Sousveillance in a Surveillance-Dominated World', *Surveillance & Society* 11(12): 18–34.
- Mau, S. (2019) *The Metric Society: On the Quantification of the Social*. Cambridge: John Wiley & Sons.
- McCabe, D. (2016) 'Numericalizing the Other: A Critical Analysis of a Strategy Discourse in a UK Bank', *Organization* 23(4): 525–549.
- Moore, P. and Robinson, A. (2016) 'The Quantified Self: What Counts in the Neoliberal Workplace', *New Media & Society* 18(11): 2774–92.
- Moore, P., Piwek, P. and Roper, R. (2018) *The Quantified Workplace: A Study in Self-Tracking, Agility and Change Management*. Cham: Palgrave Macmillan.
- Moya, J. F. and Pallud, J. (2020) 'From Panopticon to Heautopticon: A New Form of Surveillance Introduced by Quantified-Self Practices', *Information Systems Journal* 30(6): 940–76.
- Nicolini, D. (2009) 'Articulating Practice through the Interview to the Double', *Management Learning* 40(2): 195–212.
- Paring, G., Pezé, S. and Huault, I. (2017) '"Welcome to the Whiteboard, the New Member of the Team": Identity Regulation as a Sociomaterial Process', *Organization* 24(6): 844–65.
- Przegalinska, A. (2020) 'Mind Tracker as a Mediating Technology of Organization', in T. Beyes, R. Holt and C. Pias (eds) *The Oxford Handbook of Media, Technology, and Organization Studies*, pp. 265–274. Oxford: Oxford University Press.
- Rockmann, R. and Gewald, H. (2017) 'Is IT What You Make Out of IT? On Affordances, Goals, and Positive and Negative Consequences in Activity Tracking', in International conference on information systems, december, 2017, Seoul.
- Ruckenstein, M. and Schüll, N. D. (2017) 'The Datafication of Health', *Annual Review of Anthropology* 46: 261–78.
- Sewell, G. (1998) 'The Discipline of Teams: The Control of Team-based Industrial Work Through Electronic and Peer Surveillance', *Administrative Science Quarterly* 43(2): 397–428.
- Tengland, P. (2016) 'Behavior Change or Empowerment: On the Ethics of Health-Promotion Goals', *Health Care Analysis: HCA* 24(1): 24–46.
- Timmermans, S. and Tavory, I. (2012) 'Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis', *Sociological Theory* 30(3): 167–86.

- Toraldo, M., Islam, G. and Mangia, G. (2019) 'Serving Time: Volunteer Work, Liminality and the Uses of Meaningfulness at Music Festivals', *Journal of Management Studies* 56(3): 617–54.
- Wajcman, J. (2015) *Pressed for Time: The Acceleration of Life in Digital Capitalism*. Chicago, IL: University of Chicago Press.
- Zambotti, M., Claudatos, S., Inkelis, S., et al. (2015) 'Evaluation of a Consumer Fitness-Tracking Device to Assess Sleep in Adults', *Chronobiology International* 32(7): 1024–28.
- Zammuto, R. F., Griffith, T. L., Majchrzak, A., et al. (2007) 'Information Technology and the Changing Fabric of Organization', *Organization Science* 18(5): 749–62.
- Zhang, J. and Lowry, P. B. (2016) 'Designing Quantified-self 2.0 Running Platform to Ensure Physical Activity Maintenance: The Role of Achievement Goals and Achievement Motivational Affordance', in 20th Pacific Asia Conference on Information System, June 2016, Chiayi, Taiwan.
- Zuboff, S. (2019) *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. London: Profile Books.

Author biographies

Kasper Trolle Elmholdt is an assistant professor of organisation studies at department of Politics and Society, Centre for management, organisation and administration at Aalborg University. His research engages with the intersections of digital technologies, expertise, control, and organization.

Claus Elmholdt is an associate professor at department of Communication and Psychology at Aalborg University. His research explores the psychology and technology of leadership and leadership development.

Lars Haahr is an associate professor at department of Management at Aarhus School of Business and Social Sciences at Aarhus University. His research revolves around the intersections of digital technologies, people and organization.