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Creating “automatic subjects”: corporate wellness and self-tracking
Chris Till
Leeds Beckett University.

Author note.

Chris Till, School of Social, Psychological and Communication Sciences.

Correspondence concerning this article should be addressed to Chris Till, School of Social Sciences, Calverley Building, Leeds Beckett University, Leeds, LS1 3HE. Contact: c.till@leedsbeckett.ac.uk

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Abstract

The use of self-tracking devices has increased dramatically in recent years with enthusiasm from the public as well as public health officers, healthcare providers and workplaces seeking to instigate behaviour change in populations. Analysis of the ontological principles informing the design and implementation of the Apple Watch and corporate wellness programmes using self-tracking technologies shows that their primary focus is on the capture and control of attention rather than material health outcomes. Health, wellness and happiness have been conflated with productivity, which is now deemed to be dependent on the harnessing of libidinal as well as physical energy. In this context, self-tracking technologies and related corporate wellness interventions have been informed by ‘emotional design’, neuroscientific and behavioural principles which target the ‘pre subjective’ consciousness of individuals through manipulating their habits and neurological functioning. This article

draws on the work of Bernard Stiegler to suggest framing self-tracking as 'industrial temporal objects', which capture and 'short circuit' attention. It is proposed that a central aim is to 'accumulate the consciousnesses' of subjects consistent with the methods of a contemporary 'attention economy'. This new logic of accumulation informs the behaviour change strategies of designers of self-tracking devices, and corporate wellness initiatives, taking the form of 'psychotechnologies' which attempt to reconstruct active subjects as automatic and reactive 'nodes' as part of managed networks.

Introduction

This article proposes that self-tracking (ST) devices, and their integration in corporate wellness (CW) programmes, form a strategy which targets consciousness as the main site of intervention for health improvement through the capture of attention. The control of attention and libidinal energies is becoming central foci for the management of work *and* health, and the two are blurred through these interventions.

There has been widespread uptake and commercialisation of applications and devices which exploit the integration of accelerometer, Global Positioning System¹ and other technologies into smartphones and wearable devices (Chamorro-Premuzic, 2015). Devices such as the *Fitbit* bracelet or the *MapMyRun* app provide an automated means to track steps, distance and in some cases, swimming, cycling, heart rate and sleep. CW initiatives (targeting the improvement of 'wellness' of employees) have also taken up ST methods. Tracking devices are provided to workers who track their activity as part of teams who compete against others to collectively (and virtually) travel the furthest distance. The enthusiasm for ST in healthcare (Campbell, 2015) has been mirrored among CW vendors who optimistically present it as a means of producing a healthier workforce and tackling sedentarism (Pina and Ramirez, 2012).

As ST has gained in popularity, social scientific investigations of community aspects of 'Quantified Self' 'Meetup' groups² (Bode and Kristensen, 2015; Choe et al., 2014; Nafus and Sherman, 2014; Sharon, 2016; Sharon and Zandbergen, 2016) have been supplemented with analyses of ST as a commercial, self and peer surveillance enabled by 'datafication' (Albrechtslund and Lauritsen, 2013; Lupton, 2016; Ruckenstein and Schüll, 2017). Such 'dataveillance' (Lupton, 2016; Van Dijck, 2014) is seen to enable the commercial exploitation of personal data (Dewart Mcewen, 2018; Till, 2014). Recent scholarship has placed an increased emphasis on corporeality and the sensory experience of ST in the broader context of embodied engagements with data (Kennedy and Hill, 2018; Lupton et al., 2018: 662; Pink and Fors, 2017; Sanders, 2017; Smith, 2016;

Weiner and Will, 2018). ST has previously been presented as a biopolitical means of disciplining and moralising unhealthy bodies (Sanders, 2017) and considered for the role design plays in representing and mediating affective experience (Berg, 2017; Pink et al., 2017; Pink and Fors, 2017). Some work has engaged with the potential for ST to produce 'flow' or a 'state of harmonious consciousness that is goal oriented and in which people want to pursue an activity for its own value' (Lovell et al., 2007: 382). 'Flow' is thus produced through the feedback loops which 'transform the temporal structures of sociality' (Lomborg et al., 2018: 15). Alternatively, it has been seen as constructing a 'passive, choosing self' who delegates responsibility to devices which 'micro-nudge' them onto the right track (Schüll, 2016).

CW initiatives in general have been shown to be effective methods of transmitting control mechanisms from the organisation to the individual (Conrad and Walsh, 1992; Hull and Pasquale, 2018; McGillivray, 2005; Zoller, 2003). While corporate wellness self-tracking (CWST) has been positioned as neo-Taylorist and Cartesian subordination of bodies and affect to neoliberal capitalism as quantification enables surveillance and increasing precarity for workers (Moore, 2015; Moore and Piwek, 2017; Moore and Robinson, 2016). Alternatively, it has been seen as constructing a datafied control which modulates around the worker and minimises resistance to work (O'Neill, 2016: 616). CWST has also been analysed as a moral project of managerial intervention which con-flates work and health (Hull and Pasquale, 2018; Till, 2018a). This existing scholarship has presented CWST as systems of control and considered elements of their design, but so far has paid less attention to the ontological assumptions underlying them or their 'psychopolitical' engagement with the subject and how these relate to commodification practices in contemporary political economy (Carter et al., 2018: 8).

Method

This article forms an investigation into the constitution of 'automatic subjects' through analysis of the ontological principles informing the design and implementation of the *Apple Watch* (a smartwatch and fitness tracker) and two CWST programmes; *Global Corporate Challenge* (GCC) and *Virgin Pulse* (VP).³ The *Apple Watch* was chosen as a case study as it is one of the most popular ST devices, estimated to have sold 15 million in 2017 (more than *Rolux*) (Dediu, 2017), predicted to rise to 20 million in 2018 (Heisler, 2017) and with their sales tracking ahead of previous market leaders *Fitbit* (Statista, 2018). The watch can also be taken as illustrative of broader design trends as there is well-established cross-pollination between platforms (Simon, 2015) such as the appropriation of *Apple's* 'ring' system for representing daily

progress (discussed below) by the *Google Fit* app. Limited recent work has established the device as a legitimate object of analysis by showing how it counter-intuitively reasserts traditional medical hierarchies and blurs the boundary between work and play (O'Neill, 2017; Wilmott et al., 2018). Nevertheless, it should be acknowledged that ST and CWST are still only available to (and perhaps desired by) relatively few and caution must be taken not to present them as prophets of sweeping societal change or assume that they signify macro-level trends (Woolgar, 2002: 6). However, we must also be responsive to developments in science and technology, and engage with them in a reflexive and anticipatory way to avoid 'tech-nological lock-in', at which stage, mitigation of negative societal impacts may be difficult or impossible (Stilgoe et al., 2013).

The approach taken in this article is influenced by Michel Foucault's (1972) *Archaeology of Knowledge*, as it unpicks the contingency of current understandings and practices by analysing the multiple processes which constitute them (Foucault, 1994: 227). 'Archaeology' (on Foucault's terms) '[describes] the relations between statements' (Foucault, 1972: 31) and how the appearance of objects of discourse is made possible (Foucault, 1972: 40). This is achieved through establishing the 'surfaces of emergence' and 'forms of specification' (Kendall and Wickham, 2003: 26–27) of such objects or what conditions have made it possible to talk about something in a particular way. Principally, what I am concerned with, in this article, is understanding the statements which have been made about the approaches to the design of ST and CWST, and the justifications given for their perceived effectiveness. This is achieved by unpicking the statements and the broader 'discursive formations' on which they are based. Such an approach requires the researcher to identify regularities and contingencies between statements (Foucault, 1972). Doing so means tracing connections to provide a cross section or 'historical slice' (Kendall and Wickham, 2003: 30–31).

To achieve this, I took the descriptions of those designing, promoting and justifying these devices and programmes as the starting point for the investigation. Thus, I started from the most recent point and worked backwards by identifying sources which state the rationales for design choices, and the use and implementation of devices and programmes. I considered these to provide the most direct and concrete point of access available to me in the 'archive' of statements provided on my chosen topic. In the case of the *Apple Watch*, these were statements made by the designers, and for the CW programmes, these were papers produced by the vendors intended to promote them and as sources for potential purchasers to use when justifying spending of organisational funds. Texts were not sampled in the traditional sense, rather, sites where explicit principles were identified (such as neuroscientific ideas

underlying the GCC system) were traced further in order to identify the ‘forms of specification’ or the concepts and vocabularies used to make sense of a certain ‘object’ (Kendall and Wickham, 2003: 28). When influences were not explicitly cited, these were established through discursive connections between statements made in different contexts (such as between an analysis of the user interface of the *Apple Watch*, statements made by its designers and the description of ‘emotional design’). Further support for such connections can be found in the establishment of concrete historical relationships (e.g. influential organisational roles held by those defining ‘emotional design’). Ultimately, the goal was to ‘uncover the epistemological conditions of possibility’ (Garland, 2014: 369) of the particular constitution of human subjects found in ST and CWST devices and interventions.

ST, control and ‘psychotechnologies’

The crux of the analysis in this article can be summarised through an adaptation of a key statement made by Michel Foucault in his book *Discipline and Punish* in which he suggests: ‘the accumulation of men and the accumulation of capital [...] cannot be separated’ (Foucault, 1991: 221). Alternatively, in today’s digital capitalism, which is increasingly built on the capture and exploitation of attention, we might suggest that ‘the accumulation of consciousnesses and the accumulation of capital cannot be separated’. For this analysis, I draw on the work of Bernard Stiegler, who has interpreted the contemporary ‘attention economy’ (Goldhaber, 1997) as part of a move from ‘biopower’ (Foucault, 1990) (with bodies as its target) to ‘psychopower’ (Stiegler, 2010b) (focused on consciousnesses). While Foucault’s work has loomed large in critiques of ST (Ajana, 2017; Lupton, 2015, 2016; Marwick, 2012; Sanders, 2017; Whitson, 2013, 2014), a different approach is needed in order to interpret the cognitive, behaviourist and neuroscientific understanding of human subjectivity, which informs ST, and CWST, and related attempts to manage people as ‘psychopolitical subjects’ (Stiegler, 2010b, 2014; Van Camp, 2012).

It is argued that ST interventions are based on ontological assumptions that the most effective way to produce good health outcomes is to manipulate the unconscious mind of the individual. Furthermore, same strategies are considered to be effective at creating productive and effective workers through aligning notions of health, exercise and productivity through common drivers in the unconscious mind. ST systems thus attempt a new form of control consistent with contemporary capitalist forms in which the production of value is dependent on the management of attention and libidinal energy (Berardi, 2009; Stiegler, 2011) with both work and consumption considered as ‘libido captured and channelled’ (Stiegler, 2014: 9).

Just as biopolitical regimes used ‘disciplinary technologies’ to drill and standardise subjects, ‘psychopolitical control’ is exercised through ‘psychotechnologies’, which are mobilised and controlled by the ‘programming industries’ (Stiegler, 2010a). These are enterprises engaged with the shaping of human beings’ ‘retentional capacities’ (or mem-ory) through producing means of ‘tertiary retention’ or the ‘exteriorization of human memory’ (Stiegler, 2014: 77). Today, the most prominent ‘psychotechnologies’ are ‘industrial temporal objects’ such as recorded music and TV programmes which ‘capture, monopolize, and penetrate attention’ (Stiegler, 2010a: 182). This article considers ST devices to be an example of such ‘psychotechnologies’ for two reasons. First, they store the activity of the individual through recording distances and movements so act as an automated exteriorization of information. Second, ST systems also place the individual *inside* a ‘retentional system’ through coaching or simply representing activity in numeric form, which in the process creates disciplinary affects (Fotopoulou and O’Riordan, 2017). Many ST systems also ‘nudge’ users into particular behaviours at designated times and locations or use augmented reality to overlay a structure onto the physical world. Users thus respond to a dynamic temporal object in the form of the pro-gramme or algorithm directing their experience of the device or app.

Central to the ‘psychopolitical’ strategies enabled by ‘psychotechnologies’ is their ability to shape the consciousness of individuals through the manipulation of the tempo-ralities of the consumption of content by constructing ‘circuits of attention’ (Stiegler, 2010a: 54, 2014: 82). Consequently, rather than encouraging ‘deep attention’ (prolonged immersion with one stimulus), today’s ‘attention economies’ tend to ‘short-circuit’ atten-tion and formulate ‘reactive subjects’ more attuned to ‘hyper-attention’ (shallow engage-ment and rapid switching between stimuli) (Stiegler, 2010b: 73) and therefore produce people ‘less capable of reasoning, reflecting and intimacy’ (Terranova, 2012: 6). The consciousness of the subject is therefore seen as being reformed into one which is not capable of (or at least not used to) prolonged engagement and rational contemplation, rather it is reactive to stimuli and thus open to manipulation.

In what follows, I suggest that ST, and in particular its implementation in CW, is a char-acteristic of the attempted exercise of a form of ‘psychopower’, which principally targets the consciousnesses of subjects through the mobilisation of ‘psychotechnologies’.

Targeting consciousness through user design

In this section, I propose that the design principles are derived from cognitive, behav-iourist and neuroscientific principles with the consciousnesses of the

users seen as the primary target of intervention. Specifically, they are informed by 'emotional design' with instinctual and attentional responses of users as the target of intervention. It is not my intention to suggest that human beings *are* 'psychopolitical subjects' or that the strategies described are successful in their attempts to exert 'psychopolitical control'. Rather, I propose that these technologies (and related behaviour change strategies) are intended to function as 'psychotechnologies' and thus constitute attempts to exert 'psychopolitical control'.

The consciousness of individuals and groups has been a target of health behaviour change since the emergence of health promotion and social marketing approaches to health in the 1970s (Crawshaw, 2013; Petersen, 1996, 2008; Petersen and Lupton, 2000) and intensified through the greater personalisation enabled by digital profiling, targeting and surveillance (Fox, 2017: 138; Lupton, 2015: 179). However, this existing work has not fully acknowledged the move away from strategies of constructing a morally virtuous subject who is disciplined and responsible towards those trying to capture attention and manipulate people on a *pre-subjective* level to directly shape their consciousness. Thus, subjects are not moulded as, or expected to be, conscious rational actors but responsive, reactive nodes within a network.

The *Apple Watch* is designed based on principles which emphasise emotion and intimacy. As Mike Stern, the 'User Experience Evangelist' at *Apple*, stated in a talk to prospective app designers:

Interactions on Apple Watch create a more intimate and personal experience with technology. [...] Personal communication requires us to be attentive and empathetic [...] By observing and responding to people's interactions or behaviors, your app can make subtle but significant adjustments to better accommodate the preferences of the people who use it [...] By remembering basic information about how I, as an individual user, like to work out, fitness is tailoring itself to suit my individual preferences. There's no configuration that happens per se. It just happens automatically [...] And using haptic feedback to create sophisticated and more deeply life like experiences in your app. And lightweight interaction is about offering people quick and convenient access to information and actions.

The design focus is on targeting emotions and creating intimacy by tailoring the experience to the individual and accommodating their preferences to improve their fitness. Although not explicitly cited, this approach draws on the work of Don Norman who pioneered 'emotional design'. Norman established the 'User Experience Architect's Office' at *Apple* and later became the Vice President of their 'Advanced Technology Group' (although has since left and

become a vocal critic) (Norman, 2015). 'Emotional design' is founded in cognitive neuroscience principles built around the notion that,

The cognitive system interprets and makes sense of the world. Affect is the general term for the judgemental system, whether conscious or subconscious. Emotion is the conscious experience of affect, complete with attribution of its cause and identification of its object. (Norman, 2004: 11)

There are, according to Norman, three levels of emotional design; the visceral (pri-marily concerned with appearance), behavioural (pleasure and effectiveness) and reflec-tive (self-image and identity) (Norman, 2004: 38–39). The visceral system is the most basic level, of increasing significance to user design and, due to the increasing preva-lence of ST devices, also important to health behaviour change. Visceral emotions are largely instinctual and subconscious and, Norman claims, govern most of our behaviour as what we actually do often differs from what we think we do (Norman, 2004: 82).

This can be seen in the *Apple Watch's* 'Move' app which represents daily activity as three 'rings' which close following progress towards goals which *Apple's* 'human inter-face chief' described as enabling a user to 'at a glance, [...] understand that information, and easily assess where they're at [...] and] in a really simple and visceral way feel like they accomplished something' (Pierce, 2015). Progress towards the goals is signalled with vibrating 'haptic feedback' designed to feel like a 'tap on the wrist' driven by the 'taptic engine' and considered crucial in fostering an intimate relationship with the device (Fottrell, 2015).

Norman suggests that the influence of cognitive neuroscience has been significant and product designers now effectively work as ill-equipped applied behavioural scien-tists (Norman, n.d.). *Rainmaker Labs*, a design agency, who specialise in mobile and wearables, has described the impact as a 'paradigm shift' and, building on Norman's work, claim that the key objective for wearables is to encourage the user to anticipate future actions without a learning curve, thus inculcating automatic responses. This should occur in a similar way to engagement with a video game with the user automati-cally knowing how to respond to elements which 'pop up' because they form an 'active representation' of the environment through constructing 'mental images' (Rainmaker Labs, 2015). Such an approach encourages users to 'build a mental model of the com-puter model' (Wright cited in Manovich, 2002: 223) by changing automatic responses on the 'sub-individual' level and thus construing people as 'cerebral' rather than 'speaking' subjects (Väliäho, 2014: 38). The 'emotional design' approach similarly focuses on sub-conscious processes which, like Stiegler's 'psychotechnologies', attempt to 'short cir-cuit' the attention of the user through 'intuitive' engagement with the 'move' circles

and the intimacy of the 'taptic engine'. Targeting 'visceral emotions' also seeks to harness the subject's libidinal desires for engagement and connection.

In the following section, this article will unpick how similar tactics of the manipulation of automatic behaviours are built into the design of CWST initiatives and forge a link between exercise and productivity through presenting both as being controlled through the same unconscious processes.

Programming 'automatic subjects'

Recently, wellness has increasingly been conflated with 'employee engagement' and 'commitment to work' (Bevan, 2010: 16), which is demonstrated by being 'positively present' (Alfes et al., 2010: 5). Mainstream management theory now discusses a 'virtuous circle of wellbeing and engagement' (MacLeod and Clarke, 2014) with engaged employees considered to have better well-being and be more productive (CIPD, 2009; Lewis et al., 2012). This characterisation of CW and employee engagement has emerged in a context in which workers are seen as being less willing to submit to direct disciplinary controls (Boltanski and Chiapello, 2005) of the kind which Foucault (1991) described. Rather, employees are increasingly seen as 'consumers of work' (ManpowerGroup, 2017) who are intrinsically motivated to perform their work tasks. So, managers must tap into and stimulate these inner emotional and psychological states which become the driving forces of productivity (Guéry and Deleule, 2014; Till, 2018a). This focus on employee engagement and CW demonstrates the central role which desire now plays in the generation of value, making it necessary for organisations to mobilise the affective lives of workers and attempt this through the mobilisation of 'psychotechnologies'.

Consistent with the conflation of health, engagement, profitability and productivity in contemporary capitalism (Cederström and Spicer, 2015; Davies, 2016: 112), CWST programmes are presented by vendors as capable of managing the emotional lives of workers. GCC suggests that their initiative can help to deliver a 'culture of health', 'improved productivity', 'improved morale', 'stronger engagement', 'job satisfaction' and can encourage staff to 'feel supported' (GCC, 2016b). CWST is thus presented as a route to achieving both wellness and engagement through enabling workers to achieve their personal goals with productivity the result of tapping these positive emotions. VP sell their programme to employers on the basis that it will enable them to support the life projects of their workers:

When it comes to improving overall well-being, employees' goals are unique. We get to know employees, discover their goals, and design an experience to support those goals. (Virgin Pulse, n.d.)

Emotional investment is here seen as being crucial for motivating workers, and it is proposed that the most effective way to do this is to channel their personal desires by drawing on a discourse of 'authenticity' previously identified in CW programmes (Cederström, 2011).

Affective engagement is differently expressed by GCC (2016a), which focuses on 'happiness', which is considered to be a quality which gives individuals and the organisation a competitive edge:

It spills from the professional arena into the personal realm and vice versa [...] research shows that happier workers are better liked and often out-perform their less happy colleagues (p. 5).

Moreover, happiness is presented as a behavioural trait, like healthy eating or exercise, which can be stimulated through behavioural interventions. It is claimed that the key to promoting happiness at work is through 'top-down contagion' with the onus on management to create a culture of happiness. They claim 'that's essentially what happiness is: a healthy habit' (GCC, 2016a: 7), which can be passed around a workplace and stimulated through ST.

CWST systems are presented as being effective at harnessing the desires of workers because of the neuroscientific principles on which they are built, which are outlined in a video on the GCC website. This features an 'expert' voiceover narrating the experiences of, and talking to, a character representing employees called 'Jeffrey'. The narration suggests that exercise is, a 'keystone habit' which 'naturally starts to make you think about and make other changes in your life' (GCC, 2016b). The reason for this transformation is that exercise has a special quality because it releases 'Brain Derived Neurotrophic Factor':

Narrator: This acts like fertilizer for your brain's neurons making them grow quicker and develop stronger connections. You learn new skills and develop new habits more easily. By being active every day it becomes a platform to build other habits around. It's a ripple effect ... By putting in place the same principles he used to create his keystone habit he's been able to easily make other habit changes from his one keystone and without even realising it other changes began to happen ... We first make our habits then our habits make us ... So remember,

create triggers that prompt an action that gives you a reward.
Put off
short-term gratification by keeping your eye on the big prize;
your
purpose. And once a habit is routine you don't have to think
about it.
Take little steps and remember you've set in motion a set of
healthy
habits that will stick for life.

Narrator: Narrator: And that's what GCC is *all about*.

Jeffrey: 'Wow! I feel like a new person'.

Narrator: Thanks, Jeffrey. You are [a new person]; physiologically and
psycho-
logically. (GCC, 2016b)

While the voiceover on the video rarely explicitly references work tasks (instead focusing on health, exercise and well-being), the footage frequently illustrates points with depictions of the character working at his desk and exercising. The approach to understanding consciousness seen here is consistent with the now hegemonic view proffered by mainstream neuroscience in which the human brain is seen as 'plastic' and manipulable (Rose and Rose, 2014). Nikolas Rose and Joelle Abi-Rached have shown how this 'episteme' presents brains as 'fleshy' and the human psyche as 'flattened' in contrast to the 'deep' understanding proffered by psychoanalysis (Abi-Rached and Rose, 2010; Rose, 2003). The message is clearly one in which habit change (which can be achieved through the GCC programme) can directly alter brain functioning, which will lead to other (not directly related) habits and an automatic functioning of which the individual is not aware. The perceived effectiveness of the CWST initiatives is thus built on their potential to manage this 'plastic' brain through habit modification. The main strategy for this is the objectification of activity into quantified (and often visual) form and encouragement of users to act on this. ST initiatives are thus concerned with capturing the attention of individuals and 'programming' their consciousness.

The neuroscientific picture of the brain described by GCC above is a behaviourist model of intervention explicitly derived from a book, *The Power of Habit* by Charles Duhigg. Duhigg presents a single 'habit loop' ('trigger-action-reward'), which is reproduced in GCC materials, as the answer to nearly all

personal and organisational problems. This approach, according to Duhigg, recognises not only that at heart we are reactive beings but also that acting in an automatic fashion is the most efficient and productive strategy. Thought patterns are presented as capable of being modified to create (almost) automatic responses. GCC claim that a 'habit loop' works because it is 'something so small, so in sync with their current life pattern that it can take effect before they've even realised what's happening' (GCC, 2016c). The ideal is for people to change their habits 'without realising' which Chief Medical Officer of VP Rajiv Kumar suggests can be achieved by 'breaking down behaviors into micro actions in order to modify them' (Wade, 2018). When this is done, routines can be inserted and so 'the brain can be reprogrammed' (Duhigg, 2013: 77). Success is achieved when tasks are 'practiced over and over until their behaviours are automatic' (Duhigg, 2013: 64), which removes the need for decision-making and produces a situation in which 'everything [is] a reaction

– and eventually a habit – rather than a choice' (Duhigg, 2013: 80). Although not itself purporting to be a piece of serious academic scholarship, Duhigg's book is directly cited by GCC as a key foundation of their approach and combined with the neuroscientific gloss described in the discussion of the video above. The value GCC sees in ST is in the potential it provides for individuals (or their managers) to reconfigure habit loops in a more desirable direction. ST devices are thus seen as a technology which enables intervention into the automatic processes of brain functioning through manipulating habits. These encourage healthy behaviours, increase productivity and enable happiness through instilling good habits. In order to achieve their goals, managers, with the help of CW vendors, need to employ the use of technologies which affect the thought patterns of workers without them realising.

In the following section, I will suggest that a key aspect of how ST 'psychotechnologies' function is through structuring of networks to enable the contagious spread of qualities and behaviours between individuals who are reimagined as 'nodes' rather than subjects.

Nodes and networks

The discussion so far has suggested that rather than ST and CWST attempting to engage individuals on the level of discourse, as *conscious* beings, they are 'nudged' below the level of consciousness as part of a tactic of constructing them as 'automatic subjects'. The theoretical grounding of the approaches to

CWST discussed can be seen in the work of Nicholas Christakis, who has been much feted by various governments (Davies, 2016: 192–194) and is a scientific advisory board member at VP, as well as writing ‘white papers’ and promotional material for them (Christakis, 2015, 2016). Christakis imagines individuals as ‘nodes’ between whom information and behaviours pass as a form of ‘contagion’ through the ‘network’ with positive and negative qualities and actions ‘clustering’ around influential ‘nodes’ (Smith and Christakis, 2008). For those who wish to produce particular outcomes (e.g. public health officers, managers and governments), the task is to determine how to restructure the network in such a way to spread the desired kinds of behaviours and characteristics. At the heart of this approach is the assertion that it is possible to ‘use mathematical algorithms to identify key people, who if they improve their health practices, induce everyone else to copy them’ (Christakis, 2016: 5). The mathematical ontology and focus on network structures as facilitating or restricting the flow of information through the system (Smith and Christakis, 2008: 407) presents individuals as reactive agents whose behaviour, beliefs and feelings are materially affected by the structure of the network. This approach assumes that individuals are ill-equipped to achieve ‘globally optimal’ outcomes (those deemed desirable by a manager of the system) when consciously engaged in such a task and need to be ‘nudged’ in this direction (rather than actively pursuing it) (Shirado and Christakis, 2017).

This approach to managing groups and populations can be seen as being focused on a ‘mobilisation of the social’ (Till, 2018b) or a ‘new social governance’ (Davies, 2015: 445), which targets relations and networks to influence values and ultimately behaviour. The ‘automatic subject’ who is imagined by Christakis and in the work cited above is consistent with the ideal disposition towards work expressed in management theory. That is, a synchronisation between the consciousness of the worker and the tasks at hand similar to ‘flow’, which has become an increasingly significant concept in human resources management discourse in recent years (Delle Fave and Massimini, 2003; Fullagar and Kelloway, 2009; Ilies et al., 2017; Salanova et al., 2006). This is not, however, a model which is simply being imposed on workers by management. Organisations and management scholars have expressed that they feel pressured by ‘millennial’ workers to create work environments which enable the kind of engagement characterised by ‘flow’ (Deloitte, 2016; ManpowerGroup, 2016). GCC claims that their initiative can bring about similar states to that described above.

'Flow' is cited as an outcome of their programmes and an intrinsic part of 'engagement':

What we need to do is help people get to a state of flow more readily – that's the place where you are productive, time seems suspended, ideas flow easily, focus is effortless and – most importantly – effective work gets done to achieve the overall business objectives. If you're going to get the most out of your team, then you really need to foster this. (Virgin Pulse, 2016: 7)

Flow, it is assumed, can be achieved by manipulating the structures of the network (whether digital or social) in the manner described by Christakis and will have the impact proposed by Duhigg. These techniques of habit manipulation employ what Maurizio Lazzarato (following Felix Guattari) calls 'asignifying semiotics' (such as equations, algo-rithms, diagrams and computer programmes). These are symbolic but not discursive as they function 'diagrammatically', that is, they bypass representation and instead act directly in a functional manner (Lazzarato, 2014: 40). They are not intended to engage people as subjects or 'molar' individuals, but as 'molecular' collections of component parts and, for this reason, are seemingly depoliticised (Lazzarato, 2014: 41). Their purpose is to encourage people to act (or react) automatically without engaging consciousness directly.

The shaping of consciousness through restructuring networks, as Stiegler (2009: 166–167) suggests, is a characteristic of a broader model of cognition dominant in the current social imaginary. In this model, information is considered to circulate on the network level, and the individual 'node' is seen as an 'agent' for information transmission. It is the position of an individual within the network which determines their specific function and significance for the whole. The 'agents' imagined in this ontology are thus not 'cognitive' (with explicit awareness), but 'reactive' (lacking self-awareness or memory and simply responding to stimuli). ST technologies, and particularly through their integration in CW programmes, are predicated on a similar model of consciousness and network intervention. They are intended to operate through mobilising the desiring bodies of the workforce through conflating work and non-work, health and productivity. The most effective route to a healthier and happier life is presented as being the same as that which will produce a more productive life and business. In the process, the management of work and health is coming to resemble what Stiegler calls the 'programming industries',

whose primary concern is with 'accumulating consciousnesses' by monitoring and managing their attention.

Conclusion

In their attempts to improve the health of workers and the success of organisations, it is little surprise that CW initiatives produce some blurring of work and non-work as well as health and productivity (Hull and Pasquale, 2018; McGillivray, 2005; Zoller, 2003). However, what is distinctive about the case discussed here is the attempts to mobilise the desires and affective lives of workers through triggering unconscious, habitual impulses in a worker-subject who reacts automatically. These are not simply neutral attempts to improve the health, well-being and happiness of workers as tactics for improving well-ness and productivity are considered to be the same. These initiatives are attempts to intervene in the cognitive processes of individuals through encouraging them to engage with 'industrial temporal objects'. These devices are similar to other media and digital devices which restructure the consciousness of individuals by capturing and short-circuiting attention. ST devices and related platforms draw attention through notifications and alerts of achievements (or lack of them), encouraging comparison with other users and mobilising gamification. These kinds of interventions are deemed necessary because capital accumulation is no longer built predominantly on labouring bodies, but on creative, desiring and affective energy (Gregg, 2009; Hardt, 1999). Furthermore, these energies must be stimulated and directed rather than subject to strong, bureaucratic controls as the latter are less often accepted and would stifle the very energy which needs to be harnessed (Boltanski and Chiapello, 2005). The manager today is less interested in drilling and disciplining than in seducing and engaging as they have realised that in contemporary capitalism, the major potential crisis is the tendency towards a decline in libidinal energy (Berardi, 2009: 160).

Both production and consumption are engaged with the management of attention, and problems in productivity are perceived as being due to a lack of desire in the system, thus the initiatives described above seek to 're-energise' workers to create a more successful business. It is proposed that these systems can mobilise the consciousness of individuals by repurposing and harnessing the personal goals of workers for health, fitness, happiness and meaningful social connections with others into self-disciplinary methods of improving work performance. The tactics which are used are common across consumer interventions and work-based initiatives. In both cases, productivity, health and wellness are conflated, and the aim is to 'accumulate the consciousnesses' of

workers or users by attracting their attention towards particular activities often without them realising. 'Accumulation' in broad terms, Karl Marx claimed, is central to capitalist modernity (Fuchs, 2017: 94) as it is the foundation of 'capital' and the control which is required in the production of surplus value. In previous eras, the bodies of workers needed to be accumulated in physical spaces (such as factories) to extract value from their productive potential. Today, in an economy increasingly oriented towards 'immaterial' values and driven by cognitive, symbolic and emotional labour (Berardi, 2009; Hardt, 1999; Lazzarato, 2014), it is consciousnesses which must be accumulated. This new logic of accumulation informs the behaviour change strategies of designers of ST devices, and CWST initiatives, taking the form of 'psychotechnologies', which attempt to reconstruct active subjects as automatic and reactive 'nodes' as part of managed networks.

Notes

1. Accelerometers are devices able to measure the orientation of a device in three-dimensional space and are commonly used as a proxy for the movement of the user. Global Positioning System technology can locate a device (and by proxy its user) through triangulating their location in relation to satellites in geo-stationary orbit.
2. Early adopters and enthusiasts who usually developed their own techniques, software and devices to track often idiosyncratic aspects of their daily life.
3. These were two of the most widely used corporate wellness self-tracking (CWST), and since this research started, Global Corporate Challenge (GCC) and Virgin Pulse (VP) have merged (along with *ShapeUp*) to form *Virgin Pulse Global Challenge*.

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