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BODY AWARENESS, ACTIVITY TRACKERS, AND THE COGNITIVE UNCONSCIOUS*

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Abstract

This paper investigates the role activity trackers play for their users, focusing on the transformative role of wearable technology in shaping our perceptions of our bodies and health. Drawing on autophenomenography, in-depth interviews and online content analysis, it questions the neutrality of tracking data and interpretation, by drawing on Annemarie Mol's concept of ontonorms and highlighting the built-in normativity of the assemblage that makes it constantly prone to enacting a certain kind of optimal performance. Using Katherine Hayles' concept of cognitive assemblages, it defines trackers as being specific types of cognizers, entering alongside humans in assemblages in which their role sometimes ends up dethroning the body's own perceptual systems and changing the way we are aware of our own bodies. Throughout the research, three different types of users are identified and described, for whom the cognitive assemblage takes a different shape: regular users, users with medical issues and power users.

Keywords: body awareness, activity trackers, wearables, ontonorms, cognitive assemblages

1. Introduction

Fitness and health trackers are usually presented as tools that gather data to help humans get better. That means, in most discourses, being able to live healthier and more productive lives. To give an example from the website of one of the fitness trackers encountered during this research, "WHOOOP monitors your sleep, recovery, and daily effort around the clock to deliver actionable insights on how you can optimize your performance" (Pink & Fors, 2017, p. 376).

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This paper aims to uncover what lies behind such a specific narrative and explores what fitness trackers perform in the world, by going beyond some of its premises. I do this by addressing three main research questions.

The first one is ontological and questions their status as mere tools. I am interested in uncovering what exactly activity trackers are, what is their relationship with humans and human bodies and what role they play.

The second one is phenomenological and questions the way in which using a tracker affects perception and being in the world. To do this, I will look at how bodily awareness is impacted by the usage of a tracker, whose function is, in a sense, exactly that of body awareness, through which “we are aware of our bodies from the inside” (Bermúdez, 2011, p. 157).

The third one is ethical and tackles the neutrality of activity trackers, especially as it surfaces through the discourse embedded in the various graphs, insights, and recommendations they generate. It will be only shortly addressed here and will make the aim of a different article.

To tackle the tasks described above, I will be using two main conceptual pillars in my discussion on wearables and the body. The first one is Katherine Hayles’ notion of cognitive assemblage, and the second one is José Luis Bermúdez’ concept of body awareness. I will apply them to an extensive ethnographic endeavour, comprising of in-depth interviews, autophenomenography, online research, and content analysis.

2. Methodological approach

Most of the insights in the current research are based on in-depth interviews with various kinds of fitness wearable users, both current and former. I have also tried to gain access to people with different roles in the wearable ecosystem, but until now I have only managed to have an informal interview with a user-experience designer, working for one of the large fitness wearable corporations. To develop the insights, more perspectives are needed, both from inside the industry and from other closely related domains, such as the medical one. However, my two attempts to engage with industry professionals working for wearable companies were unsuccessful. It seems that inside access is very hard to gain, and the requests are usually denied at the corporate head offices, if they even get there. To protect the identity of my informants, I will not disclose their names or those of their employers. The names and identities of the other respondents have also been obscured and anonymized.

20 interviews have been conducted so far, with a wide range of respondents, both male and female, between 22 and 50 years old. Most respondents are male, with only 5 females in the sample. This might be a secondary effect of the snowball sampling that started amongst a fighting sports community, where men are the overwhelming majority. However, since that has been doubled with call for interviewees on my personal social media profiles and among networks of peers, it might also draw attention to the fact that wearable users might be mostly male. This is something that warrants further exploration but is beyond the scope of the present research.

The interviews have been supplemented with online research on various forums (on platforms such as Reddit) but also on the websites of some of the fitness wearable manufacturers, where I have looked mostly at product advertising and claims. The respondents have also provided me with screenshots of their apps or reports, which I have also used to go further in depth into the topic.

In addition, the current research also has a very important autophenomenographical component, as I have drawn insights from my own personal experience as a fitness wearable user. Autophenomenography is a term coined in 2004 by Maree Grupetta (Grupetta, 2004) and developed by Allen-Collinson (Allen-Collinson, 2011) to describe a kind of auto-ethnography rooted in the phenomenological method. While developed in sports research, wearable use is a similar domain in which any analysis could benefit from the personal engagement of the researcher in the practice, something that, in the words of Loic Wacquant, might be called a *carnal ethnography*, a way of *deploying the habitus as both empirical object and method of inquiry* (Wacquant, 2014, p. 3). While I won't be using the terminology that Wacquant draws from his mentor, Pierre Bourdieu (Bourdieu, 1977), his approach raises very important methodological questions regarding the way in which we could look at either the habitus or any kind of profoundly corporeal practice with the tools at our disposal. Similar issues have been under the scrutiny of many other scholars, either researching various kinds of sporting or embodied practices (Samudra, 2008) or critiquing classical phenomenological approaches for their limitations on accurately describing the world out there (Warnier, 2001, 2007).

Anthropologist Jean-Pierre Warnier observes a phenomenological shortcoming he calls *the Magritte effect* (Warnier, 2007), by which he means that in phenomenological and Foucauldian analysis, when we speak

about the body, we don't refer to the real body, but to a representation of it. Just as the pipe in Magritte's painting is a two-dimensional representation of a real object reduced to something completely devoid of the initial materiality, so is the phenomenological body just a representation of something much more complex, which involves, for Warnier, motricity, perception and, most of all, a very specific material culture (Warnier, 2001, p. 20). For Warnier, when an anthropologist confronts the uncanny, what was usually thought of as a credibility gap, so mostly framed in epistemological terms, is more probably a subjectivity gap (Warnier, 2011). By reframing the difference between the anthropologist and the world he is studying in ontological terms as different subjectivities, he brings to light yet another methodological issue: how can we understand, let alone describe something that's entirely strange to us? If we use language alone and ask questions, we will only gain access to representations, even if those are in line with phenomenological inquiry and relate to lived experiences. As Baars remarked in 1997, we can only *deal with descriptions of our experiences*, not with experiences in themselves (Baars, 1997, p. x). Moreover, most of what happens with and to us takes place in the nonconscious realm (Baars, 1988, 1997; Hayles, 2017), and we are aware of only a fraction of what really happens. Many processes and events compete for consciousness, but its space is extremely limited, as some consciousness theories stipulate. One of the most well-known, Baars' Global Workspace System theory (1988) compares it to a classroom blackboard or a television set. Consciousness, thus, is only what can be displayed on the board or screen.

Warnier's solution is straightforward. Instead of listening to or reading representations, we should investigate material culture, since any kind of bodily conduct, motricity and, implicitly, any kind of subjectivity is propped on material culture and objects give us a better window into what really happens out there. However, autophenomenography can present an additional solution to this problem. Especially during an enskilment or apprenticeship process (Ingold, 2000; Woods et al., 2021, p. 33), one must become very attentive to both material culture and events that would otherwise go unnoticed for a skilled practitioner, since they would be embodied and thus performed out of the global workspace, as unconscious or non-conscious processes. We might argue that the same thing can happen when material culture changes, and as such my choice to change the fitness wearable I was using during the study and later experiment with another third-party app, as detailed below, allows

for the autophenomenography to partially compensate for some of the shortcomings of the interviews critiqued by Warnier.

I have been using a fitness bracelet for the last four years and have gone through three successive iterations of the Xiaomi Band. During three of those years I have also used, infrequently, a smart body composition scale from the same brand, all the data being gathered on the same smartphone app, initially Mi Fit, then rebranded into Zepp Life. The data were also fed into Google Fit, which I never used or checked. During the current research I have switched from using the fitness bracelet to a Samsung Galaxy Watch 4, a much more advanced tracker. This has also made me change from Zepp Life to the Samsung Health App. For the last three months I have also purchased an additional yearly subscription to a third-party app, Welltory, which uses a wide ecosystem of fitness wearable manufacturers to analyse heart rate variability data and metrics.

The respondents used a wide range of different devices, from Withings, Apple, Xiaomi, Oura, Whoop, Samsung, Fitbit, or Garmin, and have had experiences with many other kinds of devices, from the first generations to the current ones. The diversity was a conscious methodological choice, as I have tried to become familiar with as many types of users, devices, and use cases and patterns, as possible. The wearable market is becoming more and more sophisticated, with new products appearing every few months, and new sensors and capabilities being constantly developed. A smartwatch or bracelet seem to have a technological lifespan of at most a year, until a new iteration comes in, and there seem to already be established niches on the market.

Some of the watches and bracelets can become very specialized and embedded in specific sports communities, as some of the Garmin or Suunto products, some are very fitness oriented, while others are more geared towards health, wellness, or sometimes very general daily usage, as a complement or even replacement to the smartphone. As the landscape was so diverse, specialization might have been a risky strategy, considering the very broad research questions I have started from. However, the downside of having so diverse viewpoints and devices is that every interview can become a very specific case study, and finding patterns or generalizing becomes a very risky academic endeavour. Despite the shortcomings, having such a broad overview has allowed me to get a glimpse of what is common among users and devices, and what has stayed the same despite the accelerated pace of change that sweeps technological developments nowadays.

3. Activity trackers

Technically, wearable fitness or activity trackers are devices designed to monitor and track fitness related data to help improve the users' overall health. In a sense, they are also personal medical devices, even if they are marketed as consumer technologies and explicitly distance themselves from the medical field and the specific domain regulations.

Wearables can do a lot of things, but what most fitness trackers have in common is the ability to extract biological data from an individual's activity and bodily functioning, send it to a more powerful processing unit, be it on the phone or on an external server, and measure it. Additionally, a lot of them – especially devices that have screens – also relay to the wearer happenings from the socio-technical environment, including the smartphone with which they are synchronized. This is done by either translating the events in haptic terms (through vibrations) or by relaying them as visual information. They also transform and translate what they extract and measure from bodily processes and actions into a specific visual form, usually as a graph. In addition, all fitness wearables also suggest or even prescribe specific courses of action, and, sometimes, they can even act independently or on our behalf¹.

I consider wearable fitness trackers to be made up of three different layers. The first one is material and contains the stuff of which they are made, the design, as well as the very specific sensors. The material design affords different capabilities for action as well as capacities for mining. This is considered a separate layer for at least two reasons. First and foremost, even wearable manufacturers consider this stable layer as the basis for future development of the devices. The Samsung Galaxy Watch, for instance, was first introduced to market with a temperature sensor that users could not utilize, since it had no corresponding measurement built into the phone app². It was what we could call a latent sensor, to be enabled only later³. Second, there are already third-party apps, from Google Fit to Welltory, that can connect to a large range of devices and sensors to extract different data than the default app with which the manufacturers ship these devices.

The second layer is what I call the computational. This is the invisible layer, made from the algorithms, data infrastructures and applications that extract data from the sensors, operate on it and feed it back to either the users or to other computing infrastructures, but usually to both.

The third and final layer is, arguably, even more invisible, and includes the conscious or sometimes even unconscious or nonconscious ethical parameters and ontionorms (Mol, 2013). Just as Annemarie Mol's research on dieting noticed that "different dieting techniques enact different versions of food and concern themselves with different bodies" (Mol, 2016), different kinds of fitness wearables also enact different lifestyles and concern themselves with different bodies.

4. The ontological question

As the first research question states, fitness trackers are usually presented as technological tools, helping humans to achieve various outcomes. However, considering the artificial intelligence debate as well as the recent ontological turns in anthropology and science and technology studies (Holbraad & Pedersen, 2017), I argue that it might be more fitting to grant them a different status. From this it will follow that the human plus wearable entity is not just an augmented human, or a mere human with a tool.

Much of the more recent literature on ontology, be it from anthropology (Holbraad & Pedersen, 2017), social and technology studies (Pickering, 2017) or the speculative realism branch of philosophy, most notably object-oriented ontology (OOO) (Harman, 2018) insists on approaching humans and non-humans, be them biological entities, matter, or even fictional entities, from a symmetrical perspective. This has a few interesting and important implications. First, all these ontological approaches, no matter how different, grant agency to non-human entities. But symmetry pushes it forward and, from an ontological perspective, both kinds of actors become equal. Once they enter a relation, their status is identical, and they become equal partners. This means, for instance, that if we conceive the human plus wearable entity as a cyborg, then the cyborg is not necessarily a new type of entity or being, in which a human's capacities for action are enhanced by technology, since this might mean that, once embodied, technology loses its specificity and only becomes an accessory. On the contrary, the new entity becomes some sort of assemblage, in which two kinds of equal actors or entities coexist.

My own ontological perspective is, however, what we might call asymmetrical in terms of relations, with asymmetry being less a type of relationship that would privilege humans over non-humans, and more

about entities with a capacity for cognition over those without it. This is the position adopted by Katherine Hayles (2017), whose notion of cognitive assemblage is also, in my opinion, the most fitting concept we could use to describe the human-with-wearable entity.

The cognitive assemblage refers to “complex interactions between human and nonhuman cognizers and their abilities to enlist material forces” (Hayles, 2017, p. 115). It “emphasizes the flow of information through a system and the choices and decisions that create, modify, and interpret the flow. While a cognitive assemblage may include material agents and forces (and almost always does so), it is the cognizers within the assemblage that enlist these affordances and direct their powers to act in complex situations” (Hayles, 2017, p. 116).

For Hayles, cognition is a “process that interprets information within contexts that connect it with meaning” (Hayles, 2017, p. 22). Her definition of cognition also allows for a transference of capacity from the biological to the technical, something she also does in her text, and is more broadly detailed in her “tripartite framework of (human) cognition” (Hayles, 2017, p. 27), a pyramid with three layers, made from consciousness on top, unconsciousness in the middle, and nonconscious cognition (or material processes) at the bottom. Together, the top two layers are modes of awareness, as the unconscious, understood here as an anthropological rather than psychoanalytical concept, easily communicates with consciousness. What separates the two layers and is the crucial difference between cognizers and material processes are choice and decision, which only arise at the top of the pyramid, leading to “possibilities for interpretation and meaning” (Hayles, 2017, p. 28).

Considering the description of the wearable devices I have offered above, as well as the socio-technical environment in which they are embedded, they can be considered technical cognizers in the sense described by Hayles. We could also identify, in their architecture, a similar layering of material processes topped by modes of awareness, which result in possibilities for interpretation of meaning and, sometimes, even in decisions or choices. However, this does not mean that we can consider their technical cognition on par with the human one. This capability is enough to grant them a specific sort of agency, through which we can later identify the way in which they function alongside human cognizers in the cognitive assemblage.

5. Wearables, the body, and everyday life

The normal state of the able, functioning body is that of absence (Leder, 1990). If nothing is wrong, we are rarely aware of it. However, whenever something breaks down, be it an injury or chronic pain, for instance, the body, in the words of Drew Leder, makes its disappearance. In a sense, everyday life, for most able-bodied people, is thus a bodyless realm. We assume that, if nothing is wrong, everything is well. We don't question the everyday, the mundane, when it comes to bodily processes. I propose that fitness wearables tend to do just that, problematize the everyday, the mundane, the absent body, by giving a voice and a representation to un/nonconscious material processes happening "inside". People don't always "discover themselves through their tracking devices" (Vegter et al., 2021, p. 7), they uncover possibly problematic aspects of their functioning.

In a sense, what the wearable sensors and algorithms do is what French Sociologist Eva Illouz observes Freud's theory did for psychic life: "By linking perversion and normality and placing them on a continuum, Freud destabilized a key cultural code regulating the boundary between normality and pathology, a move that had momentous consequences for ordinary narratives of the self" (Illouz, 2008, p. 43). Thus, everyday life became "the object of hermeneutic suspicion" (Illouz, 2008, p. 46). I argue this is the same type of suspicion that wearable enable in their wearers. With a smart bracelet, ring, or smartwatch, everyday life enters the wearable clinic, where the power of the gaze is replaced by that of the algorithm. Mundane activities, relegated to the background, become infused with medical possibilities. Everything can be data-ified and become an event with potentially medical importance. As observed by Lupton, "the assemblage that is configured by self-tracking technologies supports a reflexive, self-monitoring awareness of the body, bringing the body to the fore in ways that challenge the idea of a nonreflexive, absent body" (Lupton, 2016). This can be challenging for some potential users, as that self-monitoring awareness can be extremely unsettling. One interviewee, for instance, mentions being afraid to begin monitoring her sleep.

That's exactly why I'd hate monitoring my sleep... Or my everything for that matter. It would make me terribly anxious to see all the bad indicators. And spiralling then is just around the corner. On top of that, I wouldn't sleep worrying that I cannot sleep well enough.

The same kind of attitude was also mentioned by a different interviewee, who stopped using a Fitbit bracelet after realizing that:

I'd wake up in the middle of the night just to check my bracelet and the app to see how I was sleeping.

Wearable-driven anxieties have also been a constant of my own personal experience during this research. While writing the last pages of this paper, late at night, I looked at my phone for notifications and saw a puzzling message from my Welltory app, that tracks heart rate variability⁴. It read *Holy Burnout, Batman!* Intrigued and anxious, I opened the app, checked the detailed metrics, and saw another puzzling message. My Focus score, described as *limited*, was 44%. Its description read *Your brain isn't fried, but not quite ready to shine at the end of the day either*. I got worried, sent a screenshot to my wife, and then decided to write this paragraph and try to get some sleep, hoping it would be coherent enough for publication and my brain would recover.

In a pre-wearable time, I would have known and felt being tired, but would have linked it to the stress and lack of sleep associated with intense but normal activity. Now, however, I can't help but wonder if there isn't something medically or at least seriously wrong with my health, because of this activity.

To address this relationship between the body, perception, and everyday life in the context of wearable use I want to introduce the concept of bodily awareness, a form of self-consciousness that enables us to be directly conscious of the bodily self. Jose Luis Bermudez wrote extensively on the topic and has managed to create a very useful taxonomy among the ways in which subjects are able to find out information about their bodies (Bermúdez, 2011). The first and most important is a distinction between what he calls *first-person* and *third-person forms of bodily awareness*. The former refers to conscious or non-conscious ways of finding out how are bodies are, that extend inward, from the inside, while the latter indicates ways of being aware of the body as an object, through our sense. Feeling thirsty, for instance, would fall under the first-person category, while seeing a bruise on the back of our arm in a mirror would fall into the other.

The concept is a great starting point for a discussion about activity trackers since they seem to serve the same function as some first-person forms of bodily awareness. Considering their specific capabilities and role, I have argued, following Hayles, that they are capable of some sort of

technical cognition. They can sense, through the sensors, various bodily material processes, then they compute, interpret, and transform into both descriptions and normative prescriptions.

6. Objective, neutral data

The data wearables produce is neither simple nor neutral but have an “authoritarian dimension” (Krüger, 2018). They are moral judgments of our performance as healthy, obedient subjects of a certain regime, influencing users to behave in a certain normalized way (Lifková, 2019), as “good consumers and biocitizens” (Fotopoulou & O’Riordan, 2017, p. 54). The quantification of living they enable is often monetized, data produced by wearables being, for instance, considered by some insurance companies as underwriting criteria.⁵

When mentioning, in the beginning, the description of the WHOOP tracker, the last part addressed the optimization of performance. These two concepts merit a much closer look, as they are embedded in a much wider discussion about the self in the contemporary society. Today, we are all supposed to become entrepreneurs, not just in business but also in daily life and, in Ulrich Brockling’s words, this “entrepreneurial self is a form of subjectification” (Bröckling, 2015). As such, it never stops, and this form of self we are working on can never be attained. It is more of a process than a state. We can only strive for it and constantly improve ourselves using all sorts of tools, data, and devices such as the trackers, but also more subtle techniques of the self (Foucault, 1997), such as those advocated through the (psycho-)therapeutical discourse and self-help literature (Illouz, 2008).

While the wearables’ continuous growth and penetration⁶ is powered by a marketing discourse that implies undisputable science disguised as almighty algorithms, in practice most of them end up interpreting data in ambiguous ways and crafting confusing recommendations as well as normative judgments. Most of the time, results from tracking are compared. You are always on a scale where you can usually do better, and you end up being compared to unknown statistical averages, fellow users, or people from similar demographics. Everything is scored, and the goal of the user is to improve and maintain the numbers. But by feeding the algorithms data, the new algorithmic definitions of normal or average might be constantly shifting, as well as the goals.

As mentioned above, the hermeneutical suspicion that wearables induce in everyday life often ends up problematizing an otherwise unproblematic space, begging questions either about normal versus pathological (Canguilhem, 2013) or about able or less than able (dis-able). Every graph can be interpreted in one of those keys since every graph is a comparison to a desirable (normal or healthy) output.

If door-closer, a very simple technical artefact, can be a highly moral actor (Johnson, 1988), then an activity tracker, part of an extended assemblage with cognitive abilities, is definitely at least on par with it and should also be analysed through this ethical dimension.

7. User Types and Patterns of Use

Following the in-depth interviews, I have been able to identify three general patterns of wearable usage related to three broad categories of users. These can, however, in no way be considered representative for the entire population, given the extremely broad range of fitness wearables available and the numerous types of usage I haven't probably been able to witness or encounter during my fieldwork.

The categories that follow are nevertheless relevant following the research questions outlined in the beginning, especially when it comes to the ways in which wearable technology alters body awareness and changes our way of being in the world. They each describe people with different lifestyles and expectations when it comes to the wearable technology, and the intersection of humans and technological devices results, arguably, in different kinds of entities.

7.1. Regular Users

Regular users rarely seem to have any precise expectations, and don't seem very attached to their devices or data either. Their initial patterns of usage arise out of curiosity, and for some of them decrease over time, as they lose interest.

For this category of users, wearables are a way to become more attuned to a specific socio-technical environment, which can be both an inconvenience and an advantage. Specific processes, occurring in the user and wearable milieu, are transformed into visual data and brought

to consciousness, often through haptics. In the words of one of the first wearable users in the sample:

It was about me as a whole in relationship to the environment. The first watch that put me in touch with the phone and the messages was really something. I thought it was so cool that you could do this thing during a meeting, discreetly look at the watch and know if it's time to leave or do something else and, you know, not to reach for the phone. You know, that [...] seemed like the coolest thing at the time.

Since the wearable watch or bracelet is directly positioned on the wrist, it is considered less conspicuous than the phone, and some important notifications can be viewed or sensed without attracting attention or without consulting a device that's much more clearly separated from the physical body. However, the specific type of environmental sensing described here relates to the very specific socio-technical system in which both smartwatches or bracelets, laptops and application exist. The wearable is not a way to turn the user into a more sentient being than before, in absolute terms, being simply an *extension* of the body, but it does contribute to constructing a different kind of surrounding (Thrift, 2014).

If this new surrounding or environment fascinates some as it unfolds upon a world of possibilities, it also seems to have the opposite effect on others. The connectivity allowed by the wearable technology is considered akin to a sort of sensory overload. Being flooded by notifications isn't framed or felt as being in touch, but unable to escape a sort of surveillance and an endless list of expectations and tasks.

I wanted to get an Apple watch too. I thought it was very cool when it came out and when it was presented. But before I could buy it, someone from the office did it and after that another and another did. So, when I was in a team meeting, there were these people at the table and everyone was there with their watch, and text messages were coming in, things were happening, that was the moment when it seemed to me that it was way too invasive. [...] I liked the idea that I could have access to everything so quickly, but I realized that I wouldn't be able to stop myself from looking instantly when something came up and it would consume a lot of my time.

In other instances, fitness wearables can also become a way to get more attuned to the bodily self. Wearable users, in this case, can go through a process of self-discovery in the beginning, learning about what the

device has to say about themselves, and very often confronting or trying to validate ambiguous interoception with wearable data.

This seems a common characteristic among all user types identified, but the regular users tend to stop here, and sometimes even give up on constant wearable use after some time. For the other categories identified, usage becomes more specific and self-monitoring more intense, since it is driven by an entirely different purpose.

In some cases, a medical trigger can place users in a completely different category, if the signals prove to be worthy of consideration. For instance, one of the interviewees had gifted an Apple Watch to her father, during the pandemic. He was sceptical and didn't wear it constantly, until it gave him a heart related alarm. He followed the prescription, went to a doctor, and it appears he was in urgent need of surgery and the alert had saved his life. After the incident he started taking regular ECGs and sending them to his cardiologist on a weekly basis.

On a similar note, another interviewee discovered a brain tumour after some concerning heart rate patterns and alarms from her Mi Fit Band.

By the way, I found the brain tumour because I noticed the heart rate pattern. Ok now again, I am a geek and I have mathematical training. I noticed a difference between how my heart rate was when I was in Colombia, even in the middle of super intense physical activities like climbing 4000 meters, you know, and low oxygen and all that and intense physical activity, versus when I came back in Romania. [...] And the alerts I was getting about how "your heart rate is too high" outside the country versus in Romania. And that was the first sign. I hadn't received alerts over time, and it suddenly started giving them to me when I was in one place, not moving. I was stationary and not making any effort. So, without doing any physical effort, it said your heart rate is way too high for laying still. And too high was 120 bmp or more.

She started paying a lot more attention to the alerts and the data, and tried to correlate them with the activities she was involved in, as well as the interactions she had prior to the alerts, to better understand herself and her body. In her own words, she became much more aware of her body and self, as embedded in a much larger socio-technical context.

In terms of body awareness, we have argued that wearables identify material processes that happen non-consciously, inside the body, in a way enhancing or modifying our own body awareness. In a sense, we might argue that we also become aware of these material processes through

the intermediary of the fitness wearables and apps, the information these provide contributing to or becoming some sort of third-person forms of bodily awareness. We might also argue that the wearables act in our stead, and if we tried an exercise of alien phenomenology (Bogost, 2012), perhaps to them these events would be first-person forms of bodily awareness.

7.2. Users with Medical Issues

For users with medical issues, fitness wearables are best described as personal medical devices, or PMDs (Lynch & Farrington, 2018), “devices that are attached to, worn by, interacted with, or carried by individuals for the purposes of generating biomedical data and/or carrying out medical interventions on the person concerned” (Farrington & Lynch, 2018, p. 3). This peculiar device category is, however, not as clear cut as it might sound despite the use of *medical*, as even authors researching the field recognize that the line between wellness and medicine is often not clearly separable (Farrington & Lynch, 2018, p. 7).

For these users, fitness wearables are used to decode bodily and interpret material processes that are thus brought to consciousness, ideally in a personalized context. However, personalization is something most fitness devices or applications lack, as they prescribe predefined courses of action or targets that are pre-set by the user and probably based on large population statistics or user averages. Ideally, the wearable should act as a personal medical device that could help the person manage their bodily processes and keep their body from dis-appearing and disrupting their everyday lives.

I mean everyone tells me your body has found a balance, its balance is there. Let's not spoil any of this, because we don't know how to put it back together. And that's where the wearable comes into play, and that's kind of where this comes in as a helpful tool that helps me manage this very complicated relationship with my body.

If for a regular user, novice to the wearable socio-technical world, the data, interpretation, and even the prescriptions might be approached with curiosity in the beginning, for someone with a strong incentive to monitor their health they can become very puzzling. As uncovered in other research about medical data gathering technologies, insights are not simply “found” in the devices, but need instead to be made sense

of, and this often happens with individuals engaging in “socio-material networks of biosensing” (Kragh-Furbo et al., 2018, p. 48) such as dedicated internet forums. For most wearables, the data shown are often simple, confusing, and based either on unknown samples of users or, presumably, on statistical averages⁷. They don’t produce certainty, but often provoke a “sense of vagueness that is worked on until it becomes either clarity or action, failure or indifference” (Nafus, 2014, p. 208).

To quote, as an example, one of the results I often receive during Welltory heart rate variability measurements: “your heart rate variability is likely high. This usually means that you’re in very good shape or that your body’s systems are knee-deep in recovery. But in some cases, it can also be a sign of extreme fatigue”. As a user interested in his own health, I am always puzzled by this kind of messages. Am I in good shape, or am I extremely fatigued? What should I do next? How do I make sense of this? Similarly, other apps and devices give equally or even more confusing results. For instance, a young respondent’s Apple Watch sometimes showed, in the sleep metrics screen, a higher number for the time being asleep than for the time spent in bed.

The more personalized the data and recommendations are, however, the more the user can make sense of it alone, and the more they can get the feeling that the device is tailored to their needs. This means, for instance, recommending a variable number of steps daily, instead of the usual number that you can set up by yourself, usually at 6000, 8000 or 10000 steps per day.

A female user of the Oura ring, a wearable device that aims to “provide women with valuable knowledge and clear, streamlined data about their bodies” thus compares what she gets from the device with the more generic kind of information she would receive from the previous fitness trackers she has owned:

It’s also kind of an aggregate, it’s kind of, I feel and rely on the way it interprets these parameters that all the other wearables were giving me, and I didn’t know what to do with it. You know, you have the pulse, your heart rate, I don’t know what other thing, how many steps you have taken today. They were all data taken out of context, and I did not know whether today was good or not. I did 10000 steps today, but did I really have to? It’s an assumed thing that you should do it every day. But Oura interprets the data and if I’m exhausted it lowers the number I should do that day and tells me what to do!

In this kind of dynamic, a different kind of body awareness is carefully developed over time. Attentive correlation of personalized data with outside events and internal states assessed through interoception results, at first, into a different kind of conscious behaviour, that starts drifting into the nonconscious in time and becomes a different kind of body awareness. Perhaps the difference might be best described as an awareness of the bodily equilibrium, or the balanced state of the body described above by the respondent. Events that might or start to alter it are dealt with immediately and controlled as much as possible.

An example of how it functions in practice comes from an interview with a Garmin user making the most out of their body battery indicator, a composite measurement apparently based on heart rate variability and some other internal metrics. He mentioned checking the body battery indicator right before the interview:

Well, man, if I saw it and if it would tell me I was stressed, I would have postponed our talk. Told you I couldn't do it today; I have something else to take care of. So, let's do it in the weekend, or Monday, or next week. Because my time is precious, as much as yours. And I don't want to waste my time or yours and ruin your meeting. If I'm nervous I'll give you answers without really thinking about it. So, I would have skipped the interview, probably, because I would have considered it just another task to be done, and maybe I would have forced myself and put myself through it.

Before having the watch, he mentions how he would try and push through the day and everything he had planned regardless of how tired or stressed out he felt. But having an app tailored to his self and personalized needs helped him organize his life and pay more attention to how he felt, especially since he could easily check it with the watch measurements.

7.3. Power Users

The last category is what I have called power users, since these are people extremely interested in performance, bodily and health optimization, as well as self-measuring. They usually experiment with a lot of very specific fitness trackers and are trying to constantly fine tune their body and performance.

Fitness trackers assist them, more concretely, in two ways. The first, and most important, is to help them draw what I call a normative line when it comes to performance, effort, and health between optimal and

dangerous activity. Sometimes, the line is also drawn between optimal and not enough, but identifying when to stop makes for a much more interesting case study.

Power users also believe they are not familiar enough with the inner workings of their body to manage their health and performance on their own, especially when there are so many technological claims today regarding accurate data that can really help improve our lives in a measurable, scientific way.

Their stories are often built around a previous time when, without the assistance of a reliable fitness tracker, they were overexerting themselves without realizing it.

As I say, I made myself a little bit ill and lost a lot of weight. Ended up in the emergency room at least once, accident emergency, once because I ran too far and started peeing blood and that kind of stuff. Like I was that kind of guy. I was just like no hydration. Just run, run, run, run, run, run. No technique. You know, just make yourself not very well.

This is not an isolated experience, and it shows us how untrustworthy bodily awareness often is, in practice, for most people, and how difficult it is to know when you have crossed a serious line. It's only when the body disappears that you often become aware of the damage done.

When I started triathlon, I switched to swimming. So, I needed swim metrics, they were important for me to learn progress. You know, I had a problem with my pulse. I was very tired, and I wanted to understand why. And I found Polar, it was very good, they transmit analog data and have a patented system for swimming. Now Garmin has it too, they caught up. I was interested in real time metrics, in the water, I wanted to know when I was getting tired so I could slow down. My problem was that I was actually doing sprints in the water, but I didn't realize it. I mean with the watch I realized that for me it was a sprint, but maybe for someone else it wasn't a sprint and that's why my body felt it as anaerobic effort. And the tracker helped me, by seeing my pulse, to realize... I thought I didn't know how to breathe. The problem was that I was making too much effort for my level of technique.

Activity trackers such as the Whoop, however, promise to resolve the issue of deficient bodily awareness and “deliver actionable insights on how you can optimize your performance”. Just like Garmin with the

body battery metric mentioned above, WHOOP “analyses your key metrics like HRV and resting heart rate to determine a daily recovery score and shows you how specific lifestyle and training behaviours affect recovery”. The presentation of its metrics is designed around a discourse of optimization, as the ideal state in which you should be is, in this case, described as *optimal*.

We must be careful and not get fooled by the way wearable assemblages frame or stabilize the idea of an optimal state, since that doesn't just happen, it must be constantly performed. Without the wearable and the whole cognitive assemblage of which it is part – comprising anything from the materials of which the sensors are designed to the smartphones, the algorithms, the apps, the graphs, and the servers on which the data are stored as well as all of the other agents, human or non-human, having contributed to the research that led to their design – there could be no optimal state. For one's default state of awareness, optimal doesn't just not make any sense at all, it can't even exist.

So, what does, in practice, such a cognitive assemblage look like from the point of view of the human agent? The respondent below, a Brazilian jiu-jitsu coach, describes how he uses the WHOOP during a training session and adapts his movements to the tracker measurements.

So, the display can like show me kind of max heart rate. So how hard high have I pushed it? And it'll show my current heart rate. And so, I'll kind of like go and have a look at that. The other thing it does is it kind of like has you know how hard have you been working per session? So, it kind of gets up to a point where it says optimal and then it goes past that and it goes overreaching. OK, based on your recovery. So, I look at my heart rate and I'll be like, OK, like my heart rate super high. And I know that last round was really tough. And maybe the thing has gone into optimal. So, like I know I'm at an optimal point and I might look at my max heart rate and I'm like, OK, well, that one was like 181 max heart rate. I'm going to slow down a bit on this next round. That's kind of how I use it. It's kind of like I use those metrics to kind of like go, OK, right. Well, and then, you know, at the end of the session, it doesn't really matter. Sometimes I'm a bit kind of like I'll look at it and I'll go. I could have pushed harder in that session.

In his story there is a clear and constant focus on data, a visual artefact that can only be seen on the smartphone, a third main visible actor of the assemblage, next to the human and the tracker. Although he is aware of a round being *really tough*, his individual awareness is not enough to

decide the next move, without the visual support of the graphs. There is a constant going back and forth between intense physical activity and the devices, with punctuated adjustments, designed just to maintain that optimal point of performance.

The fine line between what's optimal and what results in too much strain on the body is always enacted with the help of the non-human actors of the cognitive assemblage and requires constant focus. In the words of Pickering (Pickering, 2017), there is a dance of agency involved.

The way the tracker is used in practice seems in this case to depict much more clearly the mediating role of the non-human part of the assemblage, as it allows the human to gain access to a different kind of third-person body awareness he then uses to adjust behaviour, after confronting it with first-person body awareness. The whole objective of this, for the coach above, is to constantly perform in that zone that wearables describe as being optimal.

8. Conclusion

In this paper, I have advanced the idea that cognitive assemblages comprising an activity tracker actually manage to fuse first- and third-person forms of body awareness, as they establish a kind of loop in between the two, in which it is the non-human cognizant (comprising the sensors' sensing capacity and the algorithmic capacity for measurement as well as the normative displays) that often takes the main role in informing subsequent action. This can be explained by a certain degree of trust (Kiran & Verbeek, 2010) being invested in the assemblage's accuracy and scientific objectivity, wherein sensors end up dethroning senses.

Moreover, the whole point of this cognitive assemblage is driven by a normative (Fox, 2017) desire to achieve an optimal state, something pervasive in today's neoliberal society. We are all supposed to become entrepreneurs, not just in business but also in daily life and, in Ulrich Brockling's words, this "entrepreneurial self is a form of subjectification" (Bröckling, 2015). As such, it never stops, and this form of self we are working on can never be attained. It is, thus, not a state of being, but a constant performance. We can only strive for it and constantly improve ourselves using all sorts of tools, data, and devices, but also more subtle techniques of the self (Foucault, 1997), such as those advocated through the (psycho-)therapeutical discourse and self-help literature (Illouz, 2008).

What fitness trackers bring to this self-optimization scene are not, as I have shown, stable, scientific, objective, and implicitly neutral recipes for success, but specific ontonorms – conceptions regarding people, bodies, activity, and performance, with a strong normative dimension.

Different trackers incorporate different ontonorms, afford different kinds of actions, and lead to different entanglements inside the cognitive assemblage between senses and sensors. The human plus wearable entity ends up being different, depending on the other agents in the assemblage and their ontonorms. And that difference doesn't just mean a different kind of externally oriented performance but, through the intricate enmeshment of the trackers functioning with body awareness, an internally oriented one as well.

NOTES

- ¹ After the launch of Apple's latest watch, at the beginning of 2023, a few odd happenings among users made it to the news stations, as 99 dispatchers started getting distress calls initiated by Apple devices owned by skiers. A new feature, that was also rolled out to other competitor devices, such as Samsung's watches, allows the devices to detect a sudden fall of the wearer, and then send a distress signal. When early adopting skiers enabled the feature, the watches interpreted the falls as serious incidents and "acted accordingly" (Matt Richtel, "My Watch Thinks I'm Dead", *The New York Times*, 3 February 2023, sec. Health, <https://www.nytimes.com/2023/02/03/health/apple-watch-911-emergency-call.html>).
- ² Android Police. "Samsung Is Finally Putting the Galaxy Watch 5's Temperature Sensor to Use", 20 April 2023. <https://www.androidpolice.com/samsung-finally-putting-galaxy-watch-5-temperature-sensor-use/>.
- ³ "Samsung Is Finally Putting the Galaxy Watch 5's Temperature Sensor to Use", Android Police, 20 April 2023, <https://www.androidpolice.com/samsung-finally-putting-galaxy-watch-5-temperature-sensor-use/>.
- ⁴ Welltory.com
- ⁵ <https://www.munichre.com/us-life/en/perspectives/wearables/wearables-the-future-is-now-wearables-for-insurance-risk-asses.html>
- ⁶ <https://www.idc.com/getdoc.jsp?containerId=prEUR148275121>
- ⁷ For instance, on my own Samsung Galaxy Watch, I receive daily a sleep score, which is compared, next to it, to a score people in a similar age range obtain. On the Mi Fit, subsequently Zepp life app, under my sleep score i receive a different kind of message, saying I have slept better than a certain percentage of users, thus linking my performance to that of an unknown number of users of the app, instead of comparing me to an unknown demographical group.

Bibliography

- ALLEN-COLLINSON, J. "Intention and epochē in tension: autophenomenography, bracketing and a novel approach to researching sporting embodiment". *Qualitative Research in Sport, Exercise and Health* 3, no. 1 (1 March 2011): 48–62.
- Android Police. "Samsung Is Finally Putting the Galaxy Watch 5's Temperature Sensor to Use", 20 April 2023. <https://www.androidpolice.com/samsung-finally-putting-galaxy-watch-5-temperature-sensor-use/>.
- BAARS, B.J. *A Cognitive Theory of Consciousness*. New York: Cambridge University Press, 1988.
- . *In the theater of consciousness: The workspace of the mind*. Oxford University Press, USA, 1997.
- BERMÚDEZ, J.L. "Bodily awareness and self-consciousness." In Gallagher, S. *The Oxford handbook of the self.*, 157–79. Oxford handbooks. New York, NY, US: Oxford University Press, 2011.
- BOGOST, I. *Alien Phenomenology, or, What It's Like to Be a Thing*. University of Minnesota Press, 2012.
- BOURDIEU, P. *Outline of a Theory of Practice*. Cambridge Studies in Social Anthropology. Cambridge, U.K.: Cambridge University Press, 1977.
- BRÖCKLING, U. *The Entrepreneurial Self. Fabricating a New Type of Subject*. Sage, 2015.
- BRYANT, Levi R. *Onto-Cartography. An Ontology of Machines and Media*. Edinburgh University Press, 2014.
- CANGUILHEM, G. *Le normal et le pathologique*. Paris: Presses Universitaires de France, 2013.
- FARRINGTON, C, & LYNCH, R. "Personal Medical Devices: People and Technology in the Context of Health". in *Quantified Lives and Vital Data: Exploring Health and Technology through Personal Medical Devices*, ed by Lynch, R. & Farrington, C. 3–16. Health, Technology and Society. London: Palgrave Macmillan UK, 2018.
- FOTOPOULOU, A. & O'RIORDAN, K. "Training to self-care: fitness tracking, biopedagogy and the healthy consumer". *Health Sociology Review* 26, no. 1: 54–68, 2017.
- FOUCAULT, M. *Histoire de la sexualité II. L'usage des plaisirs*. Paris: Gallimard, 1997.
- FOX, N. J. "Personal health technologies, micropolitics and resistance: A new materialist analysis". *Health* 21, no. 2: 136–53, 2017.
- HARMAN, G., *Objected Oriented Ontology: A New Theory of Everything*. Pelican Book. [London]: Pelican Books, 2018.
- HAYLES, N. K. *Unthought: The Power of the Cognitive Nonconscious*. Chicago, IL: University of Chicago Press, 2017.

- HOLBRAAD, M., & PEDERSEN, M.A. *The Ontological Turn: An Anthropological Exposition*. Cambridge University Press, 2017.
- ILLOUZ, E. *Therapy, Emotions, and the Culture of Self-Help*. Berkeley: University of California Press, 2008.
- INGOLD, T. *The perception of the environment: essays on livelihood, dwelling and skill*. ; New York: Routledge, 2000.
- JOHNSON, J. "Mixing Humans and Nonhumans Together: The Sociology of a Door-Closer". *Social Problems* 35, (3): 298–310, 1988.
- KIRAN, A. H., & VERBEEK, P.P. "Trusting Our Selves to Technology". *Knowledge, Technology & Policy* 23, (3): 409–27, 2010.
- KRAGH-FURBO, M., WILKINSON, J., MORT, M., ROBERTS, C., & MACKENZIE. "Biosensing Networks: Sense-Making in Consumer Genomics and Ovulation Tracking". In Lynch, R. & Farrington, C. eds. *Quantified Lives and Vital Data: Exploring Health and Technology through Personal Medical Devices*, 47–69. London: Palgrave Macmillan UK, 2018.
- KRÜGER, S. "The authoritarian dimension in digital self-tracking: Containment, commodification, subjugation". In King, V., Gerisch, B., Rosa, H. ed. *Lost in Perfection. Impacts of Optimisation on Culture and Psyche*. Routledge, 2018.
- LEDER, D. *The Absent Body*. Chicago, IL: University of Chicago Press, 1990.
- LIFKOVÁ, A. "Digital Power: Self-Tracking Technologies through Michel Foucault Lens" *Political Sciences / Politické Vedy* 22, (4): 81–101, 2019
- LUPTON, D. "Quantifying the body: monitoring and measuring health in the age of mHealth technologies". *Critical Public Health* 23, (4): 393–403, 2013.
 ——— *The Quantified Body*. Cambridge: Polity Press 2016
- LYNCH, R, & FARRINGTON, C. eds. *Quantified Lives and Vital Data: Exploring Health and Technology through Personal Medical Devices*. London: Palgrave Macmillan UK, 2018.
- MOL, A. "Mind your plate! The ontonorms of Dutch dieting", *Social Studies of Science*, 43(3), 379–396, 2013.
- NAFUS, D. "Stuck data, dead data, and disloyal data: the stops and starts in making numbers into social practices". *Distinktion: Journal of Social Theory* 15, no. 2 (4 May 2014): 208–22. <https://doi.org/10.1080/1600910X.2014.920266>.
- PICKERING, A. "The Ontological Turn: Taking Different Worlds Seriously". *Social Analysis* 61, (2): 134–50, 2017.
- PINK, S. & FORS, V. "Being in a mediated world: self-tracking and the mind–body–environment", *Cultural Geographies* 24, (3): 375–88, 2017
- RICHTEL, M. "'My Watch Thinks I'm Dead'". *The New York Times*, 3 February 2023, sec. Health. <https://www.nytimes.com/2023/02/03/health/apple-watch-911-emergency-call.html>.
- SAMUDRA, J. K. "Memory in Our Body: Thick Participation and the Translation of Kinesthetic Experience". *American Ethnologist* 35, (4): 665–81, 2008.

- VEGTER, M. W., Zwart, H. & van Gool, A.J. "The funhouse mirror: the I in personalised healthcare". *Life Sciences, Society and Policy* 17, (1):1, 2021.
- WACQUANT, L. "Homines in Extremis: What Fighting Scholars Teach Us about Habitus". *Body & Society* 20, (2): 3–17, 2014.
- WARNIER, J-P. "A Praxeological Approach to Subjectivation in a Material World". *Journal of Material Culture* 6, (5): 5–24, 2011
- . "Bodily/Material Culture and the Fighter's Subjectivity". *Journal of Material Culture* 16, (4): 359–75, 2011.
- . *The Pot-King– The Body and Technologies of Power*. Brill, 2007.
- WOODS, C. T., RUDD, J., GRAY, R. & DAVIDS, K. "Enskilment: an Ecological-Anthropological Worldview of Skill, Learning and Education in Sport". *Sports Medicine - Open* 7, (1): 33, 2021