Changing emotional engagement with running through communal self-tracking: The implications of 'teleoaffective shaping' for public health.

Introduction

The benefits of physical activity are well established and institutionalised (Das and Horton 2016). Given the public health burden of obesity (Baum and Fisher 2014), low physical activity rates continue to be a key public health concern (Guthold, Stevens et al. 2018). In this context, self-tracking of physical activity participation and other 'healthy' behaviours is highlighted in public health research focused on the use of technology (sometimes referred to as 'M-health' (mobile health) research) as having the potential to prompt and sustain behavior change and subsequently to improve public health (Piwek et al. 2016). This research tends to take an individualist perspective in focusing on the benefits of self-tracking, reporting that it can enhance self-knowledge and personal empowerment (Cox et al. 2013) and prompt change in associated constructs such as health consciousness (Stiglbauer et al. 2019) and self-efficacy (van Dijk et al. 2017). These insights are built on assumptions about individual capacity for self-change if deficits can be overcome. Despite concern over unsupported industry claims (Heneghan et al. 2012) and prior research that suggests engaging with M-health apps may not in fact cause sustained behaviour change (Allman-Farinelli, Partridge et al. 2016; Jakicic, Davis, et al. 2016; Svetkey, Batch et al. 2015), medical professionals promote their potential to revolutionise and disrupt health care, self-care, medical research, public health practice, and to reduce healthcare expenditure (Lupton 2014, 2017).

Understanding of the role of self-tracking technologies in health behaviour compliance or change has been explored at length through the 'M-health' lens (e.g. Mercer, Li, et al.

2016; Patel et al. 2015). This work seeks to understand how particular elements of self-tracking, for example different 'motivational design components' (Hassan et al. 2019), can trigger a range of measurable, individual-level health outcomes (Huang, Pham, et al. 2018; Zhang, Li, et al. 2019). One design component of particular interest to M-health researchers is the social media connectivity features of an increasing number of self-tracking consumer technologies (Comstock 2015). Strava, for example, which links to many fitness-tracking wearables, claims that it lets you do "what we call social fitness – connecting and competing with each other… providing motivation and camaraderie" (Strava 2019). In addition to writing comments and messages to each other, users can offer 'kudos' by tapping the 'thumbs up' button as a way of appreciating others' efforts and can see and acknowledge each other's successes on different pre-designated segments or accumulated distance or elevation data. Studies have noted that communicating with other Strava users, and sharing your own achievements, is an inherent part of being a Strava user (Smith and Treem 2017). Sharing and communicating on Strava is part of an overt 'social fitness' approach (Lupton 2017; Stragier et al. 2015) and a key feature of the latest communal self-tracking 'boom' in self-tracking consumption (Millington, 2016) that moves beyond the personal to the 'communal' (Lupton 2018). Existing research into communal self-tracking finds strong evidence for the influence of social interaction on sustaining or changing behaviour (Benetoli et al. 2017; Goodyear and Armour 2018; Oduor et al. 2014; Ploderer et al. 2014; Purpura et al. 2011; Wang et al. 2012).

In addition to 'M-health' studies is a well-established body of work that critiques self-tracking as voluntary self-optimization. In this view, self-tracking is an example of neo-liberal governmentality where power is diffused through a myriad of mediating mechanisms and discursive regimes producing subjectivities consonant with the

pervading political ideology (Viseu and Suchman 2010). Related critiques include: self-tracking can be 'imposed' as a form of behaviour change (Lupton 2016); can be used to mine data for commercial and political ends (Lupton 2016); and can have negative implications as self-trackers lose bodily sensations through reliance on objective monitoring (Toner 2018).

There is also body of work exploring how self-tracking has emerged in the context of socio-material and technological developments of consumption (Pantzar and Ruckenstein 2015; Pink and Fors 2017) and how it permeates and colours people's everyday routines and embodied experiences (Charitsis et al. 2018; Mol and Law 2004; Oxlund 2012; Ruckenstein 2014). It has been noted that we know little about people's practical engagement with self-tracking (Didziokaite et al. 2017; Lomborg and Frandsen, 2016) and that more investigation is needed (Lupton and Smith 2018). Taking up this challenge, studies have begun to explore the everyday, often mundane practices of self-tracking (Didžiokaitė et al. 2017; Gorm and Shklovski 2019), often by those managing illness or for leisure-time athletes, rather than self-measurement enthusiasts. These studies explore how self-tracking comes to be meaningful and might be, or fail to be, integrated into everyday routines (Lupton and Smith 2018). These studies move away from individualist accounts of self-tracking that emphasise behavioural and psychological outcomes and assume self-tracking can overcome individual deficits and help with achieving politically approved self-management and risk reduction goals. Rather, practice approaches emphasise the 'ordinary' (Didžiokaitė et al. 2017; Lomborg et al. 2018), routine, unreflexive and integrated experience of self-tracking as it permeates everyday life (Pink and Fors 2017); and explore how self-trackers collectively negotiate and reconstitute the conventions relating to different practices through their engagement with it (Gorm and Shklovski 2019; Smith and Treem 2017). Furthermore, self-trackers

and their self-tracking practices (including the materials and technology) are seen as equal partners in the constitution and reconstitution of understandings and routinized enactments of self-tracking (Lupton and Smith 2018).

We seek to extend our understanding of how people enact communal self-tracking to shape their associations with the practice being tracked. Like others (Lupton and Smith 2018), we view communal self-tracking as a number of related 'practices'. At a minimum these entangled self-tracking social practices include the gathering of data and the activity from which the data originates (Lupton 2014), but also the practices of measuring, analyzing and planning based on the data, and socializing or communicating around data in different ways for different purposes (Smith and Vonthethoff 2017). We explore how these practices, and the practices being tracked, co-evolve through routine, repeated and collective practitioner enactments and how meanings relating to the tracked activity are co-created and digitally mediated via communal self-tracking. Specifically we focus on the entangled teleoaffective structures (Schatzki 2002) of self-tracking and running; that is, the emotional associations and understandings of purpose that co-ordinate how the practices of running and self-tracking are performed by indicating what is to be achieved and why. A practice lens illuminates how routine, communal self-tracking actively shapes teleoaffective structures - associations of purpose and emotion - of the tracked activity. Our findings have implications for the way self-tracking is understood to 'work' in maintaining physical activity participation.

Self-tracking as health practice

Prior sociology of health studies highlight that activities relating to health more accurately manifest as a multiplicity of intersecting practices that co-evolve (Blue et al. 2016). This is in contrast to viewing health 'behaviours' as discrete activities (Cohn 2014) individually enacted. Practice theory emphasises that over time and through repetition,

socio-material routines become entangled with others (Schatzki et al. 2001) in a 'bundle' - separate practices but inherently entangled. The trajectory of different parts of a bundle of practices will impact on other parts in complex ways (Schatzki 2017) and important insights into the context of particular 'health' practices emerge from this view. For example Blue et al. (2016) show how smoking is not a discrete behaviour but is shaped into different forms by being integrated with related practices, such as socialising, working, eating and drinking. Similarly, drinking alcohol is shaped into different practices according to its interconnectedness with different socialising or celebratory practices (Ally et al 2016; Meier et al. 2017).

A focus on the way bundled practices are integrated and influence each other is useful for illuminating how self-tracking and the practices being tracked interrelate, particularly in terms of the teleoaffective structure of the tracked activity, experienced as emotional intensities. Although it has been noted that the theorisation of this emotional connectivity between self-tracking and tracked activities has received little attention (Lupton 2017), the nature of the associations with tracked activities emerging from self-tracking has been repeatedly noted. For example, participants gain pleasure from noticing how their physical activities contributed to a 'good' data reading (Ruckenstein 2014). Ruckenstein's respondents began to 'cherish' the steps they had taken and develop a more affective relationship either with their walking or the steps taken, creating a feedback loop. Positive experiences of heart-rate tracking have also been noted to lead to a renewed relationship with one's heart as an object of emotional attachment (Pantzar and Ruckenstein 2015). In the tracking of everyday movement, Ruckenstein (2014) found that tracking the physical activity of housework meant that people gained 'new value' from their chores. Other studies found that self-tracking provides activity with purpose that is lost when tracking ceases (Pink and Fors 2017). More negatively, studies

also find that for some tracking itself can be unpleasant (Bergroth 2019), especially when the results of self-tracking are unexpected or undesirable leading to anxiety and fragility. Lupton (2013) also finds that when people find digital interactions 'tiresome', they can respond by 'resisting' the obligations expected of them, while some 'play the system' or withdraw. Pink and Fors' (2017) respondents note that when self-tracking technology fails, activities like soccer or running can feel 'like a waste'.

These studies illuminate that self-tracking is entangled emotionally with the practices being tracked. This is often presented in Latourian terms; of technology or data 'acting on' emotional and sensory experiences relating to the tracked activity (Charitsis et al. 2017; Klauser and Albrechtslund 2014; Mol 2000), or even acting on embodied instincts (Smith and Vonthethof 2017) and undertandings of what is valued (Ruckenstein 2014). Runners become more competitive because their data will be compared with others (Lupton et al. 2018). Physical activity is perceived as a constant demand, as the absence of data will be noted by followers (Charitsis et al. 2017). When self-tracking is perceived as failing to make people become 'better people', behavioural attrition can result (Etkin 2016). The controlling (Lupton et al. 2018) nature of self-tracking is emphasised, with people responding emotionally, such as enjoying the perceived benevolence and validity afforded by devices and data, or resisting the 'tiresome' aspects of self-tracking (Ruckenstein 2014).

These studies offer an important starting point for examining the emotional entanglement between communal self-tracking and tracked activities. However, the concept of teleoaffective shaping which emerged from the current study allows this research to advance the theorization of this entanglement by examining the more co-constitutive ways that practitioners use self-tracking to actively shape their routine engagement with tracked activities. In order to examine the role of communal self-

tracking on the associations that people have towards tracked activities, we explored the use of the social fitness app 'Strava' by leisure-time runners, asking how self-tracking might encourage sustained healthy physical activity. The practice theory concept of 'teleoaffective structures' (Schatzki 2002) was used to sensitise the data. Teleoaffective structures refer to the inherent purpose and collectively agreed emotional associations of practices, which help to coordinate their enactment. As Schatzki (2001, pp.52-3) explains:

> "The teleoaffective structure… provides both goals and emotive aspirations: [It includes] a range of acceptable or correct ends, acceptable or correct tasks to carry out for these ends, acceptable or correct beliefs (etc.) given which specific tasks are carried out for the sake of these ends, and even acceptable or correct emotions out of which to do so."

Teleoaffective structures are 'of the practice' template in that they guide practice performance, but they manifest as emotional associations and understandings of the goals and purpose of practice. Practitioners draw on these associations in their enactment of practice, and they can be implicated in failures to continue with a practice. Our analysis identifies how communal self-tracking, bundled tightly with the running it tracks, can actively shape the collectively-held teleoaffective structure of running through a set of mechanisms afforded by the functionality of Strava. We call this active and co-constitutive emotional integration between practices 'teleoaffective shaping'.

Methodology

In order to explore the ways that communal self-tracking and running are dynamically entangled, this study deployed a multi-stage methodology, all parts of which were approved by the appropriate university ethics committee. To begin with, one of the researchers (author one) joined a local running club in the South-West of England and participated in weekly evening runs for six months. In addition, she joined the club's

Facebook group and three other running communities on Facebook to observe online interactions during the six months of her club membership. Online posts were read on average twice per week and key themes were noted, particularly relating to self-tracking and Strava usage. The running club was selected for its non-elite ethos. Some club members were new runners while others were more experienced. The researcher also joined Strava to track her own running, as this was the foremost self-tracking app used in the club. She then connected via social media with a selection of the other runners in the club, with their consent, to observe their use of Strava, thereby 'hanging out' with runners both in person and online (Molander and Hartmann 2018) in order to access a range of practitioner responses, interactions and emotions.

Strava uses GPS to track running and cycling, and is one of many apps that can be synchronised with wearable self-tracking devices or mobile phones to log and analyze personal physical activity. Strava is also a platform for user-user engagement, and is designed so that a user's Strava 'feed' can easily be shared via other social media platforms. Strava users can compare their performance across different, user-defined 'segments' that make up a running or cycling route. Users can win 'cups' for being top ten on a segment, receive notifications about personal records, rank themselves against others, and analyze, download and follow other people's routes.

This first phase of practice immersion highlighted two areas of interest; the variable nature of runners' engagement with running, and the variable way they engaged with self-tracking. To explore these topics further, a series of in-depth interviews were conducted. The result of this staged data collection was rich qualitative reflection by runners about how and why they use self-tracking and what role self-tracking plays in their engagement with running.

Runners were purposively recruited from the running club and online fora. All runners self-identified as self-trackers. In total, seventeen face-to-face interviews (eight women and nine men) were conducted. Follow-up discussions were conducted with some participants, mediated by Strava messenger. Interviewees self-tracked using a range of wearable devices

Interviews took place in Spring 2016 and lasted between 50 and 150 minutes. All interviews were digitally recorded. Each was conducted using a topic guide that centered on probing the interviewee to explain the detail of how, as well as why, they use self-tracking, and the role that running played in their lives both at the present time and in their past. All interviews were transcribed verbatim. Transcriptions were open and axially coded, and emergent themes identified using NVIVO11. Coding was done in an iterative process whereby researchers interrogated the data, identified emergent themes, considered theoretical implications, and went back to the data to further contextualise emerging theoretical ideas.

Findings

The teleoaffective associations that participants have with running, manifesting as different emotional intensities (Molander and Hartman 2018), are an important context for understanding the way self-tracking interacts with running. The associations inscribed in the practice of running are variable and matter enormously to practitioners. They are experienced as volatile engagements which colour their running 'career' (Shove and Pantzar 2007). Self-tracking practices are tightly bundled with running and act to shape these emotional experiences in a process of 'teleoaffective shaping'. After contextualising the findings with an overview of the experienced emotional intensities of running, we present examples of how our participants used various self-tracking practices to actively

shape the teleoaffective structure of running and facilitate their ongoing engagement with the practice.

Variable engagements with the teleoaffective structure of running emerged in our data through the emotive language used to describe running; as something 'hated' or 'loved' or something done in the "grim and dark" but also something positive that respondents would "never stop talking about". Here, Bronwen (age 36, runner for 4 years) explains how her early running experiences were painful and emotionally volatile:

> "I hated every minute of it. The only good thing about it, it was dark, it was in October so… nobody could see me… [I was] at the back, huffing and puffing but determined to do it. It was really, really tough".

Other respondents also described running as difficult, even long after running had become an established routine for them. Anne (age 28, runner for 5 years) explains how she would tell her friends how much she hated running: "I would say to all the other people in my running club: 'You don't understand! This is so much harder for me than it is for you because you guys enjoy it.'" Bronwen described sobbing in her husband's car when he dropped her off at running club because she desperately did not want to go. However, emotional associations with running were not straightforward and evolved for practitioners through each engagement, and through engagement with related practices such as socializing with running club members and taking part in races. Over time, a number of emotions associated with running would run counter to each other (Woerman and Rokka 2015). Running was associated with personal and public pride, accomplishment and joy. Anne explained how an ex-boyfriend told her she would never be a runner due to her body shape but now she runs regularly. Anne describes feelings of accomplishment which she accesses through her enactment, which she draws on to protect her loyalty to the practice.

Entwined with the emotional associations of running is its teleology, or purpose. Running is described by different participants as a way to overcome embodied difficulties, to overcome psychological obstacles (Wiltshire et al. 2017), to represent achievement and model commitment. Some mentioned the purpose of running as being for health or fitness and for many it was a way to socialise. Bronwen ran for instrumental reasons initially, to demonstrate commitment to her teenage son. Then it became a way spend time as a family, a way to socialise and a way to mentor others. For Anne, part of the reason she continues to run is because it proves her ex-boyfriend wrong and so provides a sense of personal pride as well as a means to create her desired body shape.

Through ongoing repeat performance of running in different contexts, and through interaction about running, the anticipated teleoaffective structure of running is constantly re-constituted. Teleoaffective structures are not static, but are subject to change as practitioners experience actualised emotional episodes, assess these and amend their ongoing engagement with running (Molander and Hartman 2018). In other words, practitioners actively shape their future engagement with running by creating, enhancing or protecting particular versions of it. For example, Zak explains how he managed to change how he thinks about running in line with his colleague's advice; moving away from focusing on how hard it is towards the enjoyment and achievement associated in completing a half marathon:

> "I was speaking to a colleague… and we were talking about running and I said I have always fancied doing a half marathon. And she was like, 'well you need to change how you think about running. Rather thinking about it as something that's hard work, think about it as time away from stuff and that opportunity to get your thoughts to yourself and all that stuff'. And I literally… I decided I was going to run the [local] half marathon in the September…"

Zak's story illustrates the active involvement of practitioners in their future engagement with running through actively shaping associations relating to its purpose and meaning. Our study focuses particularly on the way practitioners use communal self-tracking to shape their future engagement and the running practice template, positioning communal self-tracking as a collective means of meaning production (Lomborg and Frandsen 2016). The mechanisms we have identified below are examples of the way that self-tracking affords the active teleoaffective shaping of running by enabling practitioners to work on their collectively held emotional and purpose-related associations with running.

Mechanism for teleoaffective shaping: Labelling

Our data highlights the way that Strava affords the labelling of running engagements as a mechanism for establishing, changing or emphasizing practitioner-held meanings and emotions associated with running. Strava auto-assigns running logs with simple labels such as 'afternoon run', 'morning run' and so on, depending on the time of day. The user is always easily able to change the name of a run should they wish. Some of our respondents reflected that they would change these labels to explain when expectations of performance were not met; for example to denote illness, slow-paced recovery after a race or a slower running partner. However, labelling was also used to assign runs with particular personal value. Some respondents were adamant that everyday commutes to work should not "litter" the Strava feed of people they follow, and mostly only used Strava to record fun, social runs or hard training runs because these were the runs that "counted". However, others, like Mark (age 30, runner for 15 years), logged every run but simply changed the name of 'proper' runs such as interval sessions and club training to reflect their intensity or significance. Similarly, Ralph (age 38, runner for 8 years) explained that he changes the name of runs when he has been somewhere interesting. He tends to ignore the daily commute, which he tracks for completeness.

The following list of labelled runs is taken from Hettie's Strava feed over the course of three weeks:

> "Evening easy run… ventured over some trails thanks to a v bright moon"

> "Couldn't face being sociable tonight so lone run it was"

> "4.5/5 miles easy chat run with Kathy"

> "Long run route with the team"

> "Club run with cool down"

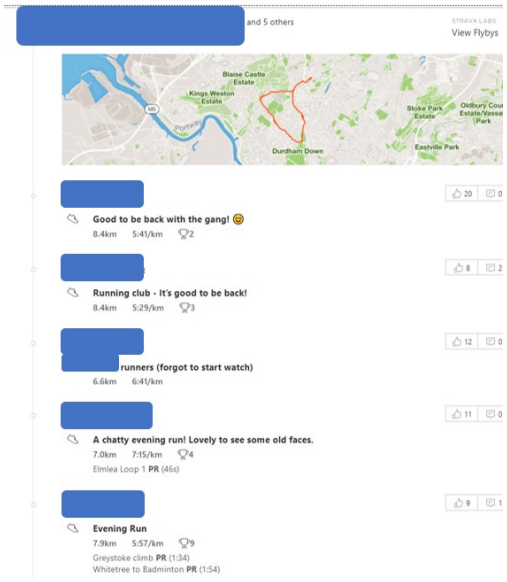
Hettie (age 23, runner for 5 years) actively assigns purpose, emotion, projects and goals to the practice of running through these labels (Schatzki 2002). She positions running as sociable, an opportunity for time alone, an opportunity for relaxation or as part of the routine performance of club membership. The labels both create a record of what running meant in each unique enactment, but also creates meaning itself, as labels become anchors for understandings about engagements with future running. Labelling opens up the possibility for runners that enacting running can draw on a number of associations. The purposeful creation of meaning through labelling can be taken forward to organise future enactments.

As well as helping to organise ongoing individual practitioner engagements, labelling was enacted in the context of 'social fitness' to provide a visible and shared label around which associations can be collectively negotiated. For example, labels might actively invite affirmation that running is tough and as such represents an enjoyed shared moment of triumph amongst a tight group. Glen's label for a hard training run illustrates this: "Some sort of masochistic hill torture session – loved it! Cheers fellas" (Glen, age 42, runner for 10 years). Glen is creating emotional associations and purpose for his own

engagement with a version of running that most appeals. However, he is also inviting interaction around the toughness of the training session and creating a sense of exclusivity amongst the 'fellas' with whom he shared the engagement. His label reframes the run from being just 'tough' to being collectively and individually appealing in its toughness. Similarly, other labels invite interaction around the fun of running, as when Rose's labelled a run as "Tough run with the Tuesday crowd. Thanks guys!" (Rose, age 31, runner for 4 years). The interactions prompted by these labels affords collective affirmation about the purpose, expectation and moods associated with the running practice template which are constituted and reconstituted via interactions facilitated by the self-tracking app as much as they are by the repeated performances of these versions of running practice.

Mechanism for teleoaffective shaping: Reward

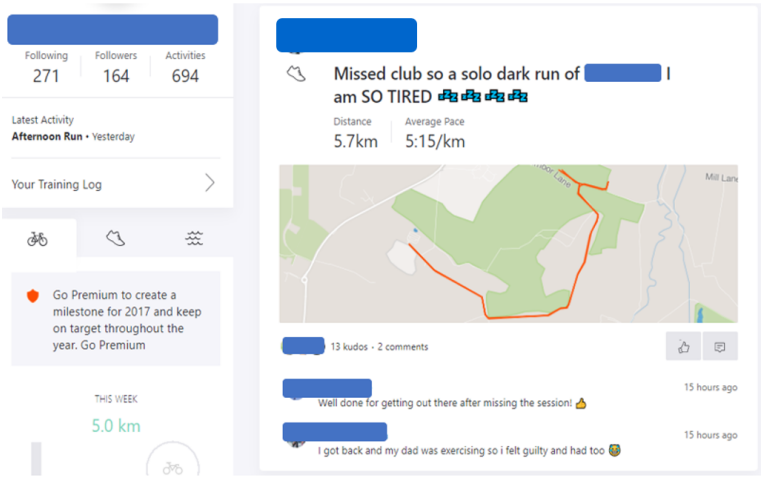
Strava provides rewards for achievements for top ten achievements in different segments in the form of trophies that automatically appear in a user's feed. However, runners also proactively *use* Strava to reward engagements with running and this repositions running positively; away from any actualised sense of embodied struggle. In the Strava interaction extract below, club members self-refer as a 'gang' and reward fellow members through mutual appreciation, comments of support and multiple offerings of 'kudos' (visible through the number of 'thumbs ups' per comment):



340

341 The run, however it was in fact experienced, is positioned through this rewarding activity
342 as social, 'chatty' and 'lovely', which is reinforced through the collective 'kudos' and co-
343 created narrative. The teleoaffective associations of 'running as social', repeatedly created
344 through such collective rewarding, can be carried forward into future engagements with
345 running.

346 The process of rewarding the Strava-mediated construction of meanings associated with
347 running also works when the engagement with running is a solitary activity. In the
348 following extract, Hettie is transparent about the difficulties she felt in getting out for a
349 solo run, but the comments and 'kudos' her log attracts shift the emphasis from the
350 hardship of her individual encounter to the social reward her Strava entry attracts:



Hettie responds to the comment from her 'follower' within the hour, showing how the comments function in Strava also facilitates an opportunity for assessing the bygone performance of running and for guiding its future practical enactment (Molander and Hartmann 2018). She does this by shaping emotional associations away from hardship or guilt and, in this case, towards accomplishment. The reward offered by followers in this vein allows the practitioner to continue with running even if difficult, because it has been repositioned as worthwhile. Indeed, the very difficulty often becomes part of the routinised and anticipated appealing aspects of running. Runners know that the reward will come once the run appears on Strava, and this may explain some of the 'devastation' our participants described when their self-tracking technology failed, because they will miss the rewards.

As demonstrated by the number of 'kudos' rewards in the above extracts, Strava's kudos button represents a popular way of demonstrating reward, and a useful cue for followers and trackers to scan for clusters of collective appreciation. Bronwen, for example talks about the 'kudos' button, noting that, "There is a lot of support for each other because we all know how hard it can be sometimes to do it." For Bronwen, receiving multiple 'kudos' for a run reframes her effort as worthwhile in the eyes of a social network of other runners, even if no comments are written. For Ralph, social affirmation through

the kudos function is a way of starting a conversation in Strava about particular runs or future plans. He explained that he "likes to see what people are noticing" and he will often "follow up with my own comments". For him, 'kudos' carries a lot of meaning; of respect and interest, and it positions his activity as having been noted by particular 'followers', which he will check, so that he might follow up with a comment or direct message to individuals. It is also significant how many thumbs up an activity attracts, and Ralph explained that he will notice the volume of support for particular runs and often 'click' the kudos button himself. Jane (age 38, runner for 5 years) explains that often she barely engages with her actual running data, but routinely scans the Strava feed for shows of support. She explains that 'kudos' is an 'automatic' or routinised part of interacting through the Strava:

> "There is always the kudos, always the thumbs up, that is almost an automatic. You don't always look at [the run feed] but you give a thumbs up."

Providing reward for others is part of the self-tracking bundle of practices that is facilitated by Strava (Lupton 2017). The labelling and 'kudos' and comment functions allow runners to easily and collectively create a narrative around the practice of running that ameliorates individualised experiences of enactment. In this way, running becomes a socially constructed and dynamically negotiated activity. It is both a rewarded and rewarding activity facilitated through these easy, automated virtual interactions and recreated through every repeated ongoing engagement with running.

Mechanism for teleoaffective shaping: Materialising effort

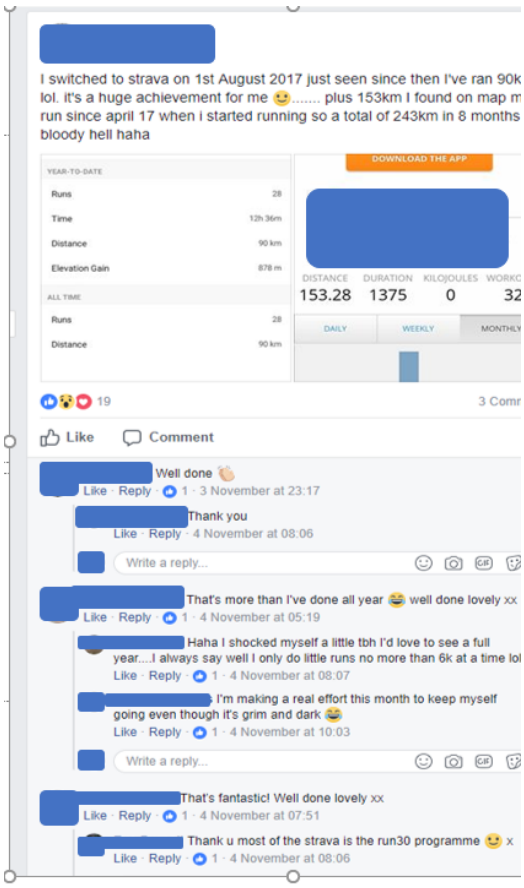
Materialisation refers to the use of self-tracking to make permanent and concrete otherwise intangible engagement with running, by visualising it materially. This drive to capture physical accomplishments has been noted by others (Throsby 2016). When reflecting on their logging activities, practitioners describe this logging as the

materialisation of the intangibility of running and it is highly significant for their ongoing relationship with running. Materialisation was often underpinned by principles of completeness and accuracy, and framed by rules and procedures for maintaining completeness. For example, Sam (age 40), a daily logger and established runner of 17 years, explains that he logs every run, and indeed every bike ride and swim, that he completes, no matter how short. Sam's commute to work on foot might only be a few kilometers, but having a complete log feels important; to create the full picture of his commitment. He writes notes to explain the context of particular efforts, and ensures that no run is missed, however short. Sam's explanation for why he is preoccupied with completeness is twofold. On the one hand he explains that he is "scared to miss a day; it feels like I'm losing fitness", and on the other he uses his impressively crowded Strava feed as the basis for friendly competition amongst his co-workers: "It's about who's done the most and who's been fastest on the way in". Sam works to materialise his running in order to make it meaningful for his understanding of his own fitness and as an enduring record, which is a source of pride.

Zak is another respondent who works hard to ensure his Strava feed is fully and materially illustrative of his efforts, and like Sam he uses this as a tangible account of his commitment to running, and as a basis for engaging with an audience. In Zak's case the audience is both on and offline. Zak (age 37, runner for 6 years) set a challenge for himself to run every day in January, but this carried on and on until "at one point I was saying I was on January the 79th; it was a resounding joke. It was always January". He explained how soon he would have to announce at his running club that he was planning on stopping because people would expect to see his Strava feed every day. If he failed to log a run he would receive messages via Strava asking what happened. For both Sam and Zak, self-tracking provides a means to create and protect an accumulated Strava profile

and to interact around this profile with an audience. This positions their engagement with running as committed, extreme and consistent, which is meaningful to them and shapes the teleoaffective associations of their future engagements with running.

The 'pride' in accomplishment over time is evident in Eliza's Facebook post about her Strava profile:



Eliza (age 43, runner for 2 years) announces to her Facebook followers that she has accomplished a huge achievement by accumulating 90km of running since 1st August 2017, which is illustrated through the screen shot from Strava that she shares on Facebook. Eliza is 'shocked' at her feat and uses the materialisation of her achievement as a basis for interaction. Specifically, she attracts social affirmation that serves to position her relationship with running as accomplishment and success and to move it

away from, as one of the follow-up comments notes, an anticipated sense that it requires 'real effort' and happens in the 'grim and dark'. The visibility of her accumulated totals in Strava allows runners like Eliza to associate unique engagements with running, which may be 'grim' through the lens of a larger project which has tangible form and is made visible for social reward.

Discussion

In developing the concept of 'teleoaffective shaping' as an outcome of communal self-tracking, we draw on Molander and Hartmann's (2018) focus on emotion in the evolution of practice. They specify that alongside the routine way that practitioners draw on anticipated teleoaffective associations in their actual enactment of practice, practitioners also routinely assess emotional experiences and trigger "adjustment of planned future behavior" (p.12). This assessment and shaping of future engagement happens as part of the routine engagement with practice, i.e. the practice *allows* practitioners to 'assess' their engagement in an ongoing process which involves monitoring past engagements, understanding anticipated engagements and understanding the desired outcomes of future engagements. Our findings suggest that our practitioners are able to use the various practices that make up the communal self-tracking bundle to 'work on' the teleoaffective associations they hold with running, and shape their anticipated teleoaffective engagement with running. These reworked teleoaffective structures can be carried forward, repeated and reinforced through both communal self-tracking interactions and actualised future experience.

Our study makes three important contributions to the existing body of research exploring the potential of communal self-tracking for physical activity participation. First, we illustrate a new way of understanding how communal self-tracking works to support sustained physical activity, which may be experienced as unpleasant or have unappealing

457 associations. Our study illustrates that practitioners can change the way they engage with
458 running. Our respondents relabeled exhausted solo night runs to attract affirmation and
459 support for a version of running emphasizing self-discipline and commitment. They used
460 the kudos and comments to reaffirm informal 'club' membership and reposition running
461 as focusing on social bonds. They shared accumulated logs on Facebook to discuss their
462 achievement and invited a shared sense that running is a hard but a worthwhile
463 accomplishment. Through these interactions, running becomes reconstituted as a socially
464 shared and meaningful practice, manifesting as multiple versions, to which self-tracking
465 practitioners can align themselves. Our study therefore provides evidence for a
466 developed understanding of the way that the tight bundling of communal self-tracking
467 and physical activity might work for supporting physical activity. Communal self-tracking
468 provides mechanisms for acting upon the emotional and purpose-oriented associations
469 of physical activity in order to move it from having limited appeal to having dynamic
470 appeal that can more effectively retain practitioner attention and loyalty as careers
471 develop. Emotional entanglement between self-tracking and tracked activities has been
472 noted by others (Lupton 2013; Ruckenstein 2014), and our study provides a theoretical
473 mechanism for understanding this entanglement.

474 Second, our study emphasises the active part that practitioners play in the dynamic
475 creation and recreation of meanings relating to physical activity practice. Existing studies
476 tend to imagine users as 'responsive' to doses of the social networking functions of self-
477 tracking apps (Hassan et al. 2019), or to the agency of self-tracking technology (Klauser
478 and Albrechtslund 2014). In positive terms, self-tracking is seen as boosting social
479 comparison, emotional support, enjoyment and empowerment, and ultimately increases
480 motivation to keep active. In contrast, our analysis foregrounds the recursive nature of
481 practices and practitioner performances, which is a strong theme in recent practice-

oriented consumption studies (Phipps and Ozanne 2017; Molander and Hartmann 2018) with neither practitioner agency nor socially normative patterns of activity taking center stage. Rather, practitioners are central in the dynamics of ongoing practice change (Maller 2015). Our data illustrates how the appeal of running, and by implication ongoing running 'careers', are the result of a dynamic evolution of the way running is experienced, anticipated and worked on to become progressively more 'agreeable' in different ways. Respondents describe hating running initially but now talking about it 'all the time', sharing accomplishments and relishing in their career stories. Via Strava, adaptive practitioners share their accumulated stats or the labels they assign to runs and invite collective affirmation for the versions of running that are being emphasised through the online narrative, and for those which are being mollified. The survival of running practice is therefore the result of a dynamic interplay between collective practitioner negotiations of meaning and ongoing performances in which those meanings are enacted; both of which are routinised as part of the practice bundle of running and communal self-tracking. This insight advances existing conceptualisations by moving away from the notion of self-trackers as 'responsive' and, rather, foregrounding both the entangled nature of self-tracking and running, and the entangled nature of performances and practice.

Third, our findings also suggest potential lessons for digital health interventions seeking to support sustained physical activity because they highlight the multitude of ways that Strava facilitates interactions for teleoaffective shaping. Teleoaffective shaping is mediated in some cases by direct engagements with data, for example when practitioners concern themselves with accumulated totals. However, in some cases, practitioners bypass their data altogether and focus on the comments and kudos they receive for logging a run, irrespective of the data produced. Practitioners examine lists of 'kudos'

and pursue ongoing interactions with particular followers, or create labels that 'speak' to particular groups with whom a run was in fact performed. Strava provides multiple ways for users to interrelate, from leaderboards to kudos, comments, direct messages and exporting data to other social platforms. Relating to a sense of the multiple, interrelated practices of self-tracking, our findings concur with other studies (Mol 2000; Ruckenstein 2014) which have noted how practitioners engage with self-tracking in numerate ways depending on personal projects and trajectories (Lupton and Smith 2018). Our findings indicate that this flexibility and multiplicity in design underpins the sense of active participation as opposed to loss of agency. We note that other studies have reported that respondents can feel 'controlled' by wearable technology and self-tracking, which can lead to attrition and protest (Ruckenstein 2014), or that social connectivity can feel tokenistic (Fotopoulou et al. 2016) or part of a marketing agenda (Charitsis et al. 2018). Strava, in providing a range of integrated ways through which teleoaffective shaping projects can be undertaken, has created a diverse experience of social interaction and meaning making, which in fact ties closely with the benefits of communal physical activity found in other studies (Copelton 2010; Wiltshire et al. 2018). We note that device manufacturers assume that users primarily are interested in 'getting more health-related information' (Pantzar and Ruckenstein 2015), but in fact much of this 'health optimization' data can fail to engage people (Ruckenstein 2014) and attrition from self-tracking is common (Lupton and Smith 2018). It may be that other features, including the capacity for free-flowing communal dialogue, are most important for sustained engagement with self-tracking and the tracked activity. It is therefore important to note that a potential downside to the routinised social interaction afforded by Strava may emerge from the entangled nature of enacting and sharing physical activity accomplishments. In the event of technological failure, the inability to share and interact

around some tracks may have a disruptive or even reverse (negative) effect on the teleoaffective shaping of physical activity.

Finally, it is important to highlight a key limitation of our study, which is its particular focus on the positive teleoaffective shaping of running by users of a social fitness app. This was a useful context for a first exploration of the concept of teleoaffective shaping, but future studies might consider the multiple ways that self-tracking affords teleoaffective shaping of tracked practices. For example, future research might interrogate how teleoaffective shaping happens in private self-tracking, and might focus on how a range of collective associations relating to particular practices are shaped and evolve in different ways. Teleoaffective shaping might be implicated in how notions of competitiveness, adventurousness or obsessiveness might be cultivated through self-tracking. We begin to see that interaction around Zak's data has begun to collectively legitimise running every day, and possibly to the emergence of dangerous bodily practices noted in other self-tracking studies (Charitsis et al. 2018). Similarly, other respondents in our research seek and receive social affirmation for extreme or adventurous patterns of running and in other cases, personal profiles are collectively rewarded for their volume. Future research might explore a range of associations that may be shaped powerfully through communal and other forms of self-tracking via mechanisms including, but expanding beyond, those we have identified.

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