

Article

Menstrual Tracking, Fitness Tracking and Body Work: Digital Tracking Tools and Their Use in Optimising Health, Beauty, Wellness and the Aesthetic Self

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Abstract: Digital self-tracking tools can be part of body work to measure, monitor, and optimise progress towards idealised versions of the self. Fitness and calorie trackers are obvious examples but menstrual tracking apps, which can track a large range of bodily ‘symptoms’, can also be part of body work. In this article, I present accounts of young people’s menstrual and fitness tracking experiences from existing literature, illustrating how both types of trackers can function as part of their users’ body work. I interweave these stories with an autoethnographic account of my own embodied experiences with and through menstrual and fitness tracking apps. I explore the ways in which health, beauty, and wellness can become enmeshed in self-tracking practices; how emotions, stress, and sleep can become personal problems to solve; how tracking tools can make body work feel more ‘real’; and the mutual but asymmetrical shaping of digital tracking tools and their users. Though there is an existing body of work on young people’s experiences of digital self-tracking tools more generally (particularly health and fitness tracking tools), young people’s use of menstrual tracking apps is a relatively understudied phenomenon to date. The themes identified in this article point towards possible avenues for future research.

Keywords: self-tracking; digital menstrual tracking; fitness tracking; body work; health; beauty; wellness



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1. Introduction

Digital self-tracking is the practice of using digital tools to track, measure, monitor, analyse, and visualise embodied processes and actions [1,2]. Digital self-tracking tools include wearable, sensor-equipped devices and digital applications (apps) with which to track and record practices and behaviour [3]. Health and fitness apps and devices (such as fitness bands equipped with biometric sensors, and movement/positional sensors such as GPS and accelerometers) are among the most popular [2], tracking (direct or derived) metrics for, for example, calories consumed and expended, movement, heart rate, and sleep [3]. Digital menstrual tracking apps are used to track menstrual cycles and associated ‘symptoms’, to predict ovulation and upcoming periods [4,5], and often offer articles and advice on menstruation, fertility, pregnancy, and general health and wellness. Menstrual tracking apps are among the top-downloaded apps by adult and adolescent women in health categories [6] with hundreds of millions of downloads worldwide [5].

From a Foucauldian perspective, self-tracking tools and practices can be understood as “technologies of the self” [7] (p. 18) with which people surveil, regulate, act on, and optimise their bodies in line with health and appearance norms [1,3,4,8]. The examination and study of the self and its digital traces in the pursuit of self-knowledge can be further situated as biopedagogy: education of the self in service of meeting these normative standards [8]. These processes occur within the wider sociopolitical context of neoliberalism, in which choice and individuality are emphasised, and where health is commodified and is an individual’s responsibility to achieve and maintain [3,5,8]. This focus on health at the

individual level is reflected in the primarily biological explanations offered by self-tracking tools for a wide range of bodily and affective states [1,6,8]. Digital menstrual tracking adds a gendered wrinkle to self-tracking practices, where measurement and evaluation brings order and control to menstruators' 'chaotic' and 'unpredictable' bodies [4,8], and where a focus on ovulation and fertility reflects a normative gender standard [4] and "expectation of reproductive citizenship" [5] (p. 3). Though digital fitness tracking tools are not necessarily gendered by design, patterns of use often align with normative gendered standards of appearance: women and girls are more likely to track, for example, calorie metrics in service of weight loss goals, while men and boys are more likely to track metrics measuring athletic performance and track progress towards goals like increasing muscularity [3,9].

New feminist materialist ways of understanding self-tracking focus on the affordances and capacities for action that are brought into being when entanglements/assemblages of people, objects (e.g., tracking devices), bodily practices, discourses, ideals, spaces, algorithms, and relationships come together [10]. A new materialist conceptualisation of 'body work'—"the practices or 'work' one performs on one's own body" to achieve or maintain particular bodily states (e.g., slenderness)—is also helpful in exploring self-tracking [11,12]. With regards to research into digital self-tracking from a feminist new materialist perspective, Lupton [13] applies a feminist new materialist lens to women's use of pregnancy tracking apps, finding that digital pregnancy tracking tools "become part of the materialities of care, or the spaces and things that are imbricated in and with caring labour and caring affects" (p. 398). Andelsman [14] explores the ways in which bodies and menstrual cycles are experienced, constituted, and "brought into being" (p. 54) by digital menstrual tracking practices. She notes the way in which (hormonal) bodily processes are materialised in apps—presented and experienced in systematic cycles and sequential phases of normative length and periodicity.

The existing qualitative sociological work on young people's digital self-tracking practices is often focused on health and fitness tracking. Findings from these works are varied, from young people expressing scepticism towards the value of fitness tracking devices as part of school-based physical education [15], disappointment that fitness tracking does not cater well to the social aspect of sport [16], and feelings of pressure, competition, and guilt [17]. Other work has found that young people value the use of fitness trackers to support existing fitness behaviours or help adopt new ones [18], and that they value digital health technologies more generally for their ability to generate detailed, personalised information about their health and bodies [19], especially when used in conjunction with advice from trusted adults [20]. To date, there is very little qualitative sociological work exploring young people's use of digital menstrual tracking tools, though in some cases, young people are represented among participants in studies not specifically focused on youth (e.g., [5,6,14,21]).

In this article, I approach self-tracking using a primarily Foucauldian lens, attempting to incorporate feminist new materialist perspectives. I have used autoethnographic practice to help guide my exploratory investigation, paying attention to the ways in which digital self-tracking, including fitness tracking but particularly digital menstrual tracking, can be part of the optimisation of health, beauty, wellness and the aesthetic self. I have used autoethnography to orient myself to potential patterns of meaning, to help inform an investigation of young people's experiences of digital self-tracking in existing literature, and with the aim of providing depth, context, and a sense of story to the research findings.

My primary findings from this research are that digital self-tracking tools, including fitness and menstrual tracking tools, can be part of body work practices towards idealised versions of the self, and that:

- Health, beauty, and wellness can blend and become enmeshed in self-tracking practices and tracking apps.
- Emotional states, sleep, and stress can be experienced as primarily personal problems to solve in self-tracking practices, potentially dislocated from social and/or structural causes and solutions.

- Bodily sensations, processes, and body work can seem more ‘real’ when they are documented, quantified, and visualised with digital tracking tools.
- Tracking apps and their users are mutually but asymmetrically shaping.

I found evidence of young people’s experiences of each of the above findings in the existing literature about their use of self-tracking tools. In each case, there is a range of experiences and responses among young people, from uncritical to ambivalent to sceptical and resistant.

2. Methods

In this article, I have attempted a hybrid method that borrows and combines techniques from autoethnography [22] and pattern-based discourse analysis [23,24], incorporating perspectives and approaches from feminist new materialist research [10].

2.1. Phase 1: Autoethnography

The starting point for my research is an autoethnographic exploration of my own self-tracking, investigating experiences, practice, and beliefs [22] brought into being with and through my use of digital self-tracking tools. Previous autoethnographic studies of embodiment and embodied practices (e.g., [25,26]), including self-tracking practices [27,28], contribute rich descriptions of personal experience while highlighting the researcher’s subjectivity and embeddedness in their research [22,29]. Autoethnography situates personal experiences in a wider sociocultural context [29] and can align with the feminist tradition of showing how the ‘personal is political’ [29,30].

I am a 40-year-old woman with approximately 10 years experience of digital self-tracking: starting with the intermittent use of a calorie tracker and running-mapping tool, and more recently (within the previous two years) shifting to a fitness tracker and a menstrual tracker. My interest in menstrual tracking as a tool of body work was prompted when I was struck by the similarities between my experiences of menstrual tracking and my more fitness-focused tracking experiences, particularly in terms of their roles in my appearance and body work. My menstrual and fitness tracking tools have become intimately entwined in my self-tracking practices and experiences, with data imported from my fitness tracker into my menstrual tracker and plotted against predicted hormonal cycles, and via advice from my period tracker to adapt my exercise regime over the course of my menstrual cycle.

I collected autoethnographic data over a period of several months in my late 30s. My approach centred around my continued daily use of (1) a menstrual tracking app, and (2) a fitness tracking app with sensor-equipped fitness band. The fitness tracking app uses data automatically imported from the fitness band, and data I manually input; the period tracking app primarily uses manually input data along with some data imported from my fitness tracking app. As discussed above, they are interconnected parts of my digital health and appearance body work assemblages, and, for this reason, I have included both in my autoethnographic investigation.

To collect autoethnographic data, I paid close attention to my embodied affects, thoughts, feelings, sensations, and bodily experiences when using these tools. I took screenshots of my apps when I noticed something that felt interesting or important in the moment, when I experienced “affective resonances” [10] (p. 2001). I occasionally jotted down reflexive notes in and across documents, but the screenshots made up the bulk of my autoethnographic documentation, bringing to mind my embodied thoughts and feelings when I reviewed them. The role of menstrual tracking in my body work was more salient and striking to me than the (perhaps more obvious) connection between fitness tracking and body work. As such, my menstrual tracking experiences are relatively overrepresented in my autoethnographic data.

Phase 1 started before, and continued in parallel with, phase 2.

2.2. Phase 2: Locating Young People's Experiences in Literature

As I am not a young person, my autoethnographic approach alone would not reveal anything about young people's experiences with self-tracking. As such, I have attempted to use my autoethnographic experience as a starting point to orient myself to potential patterns of meaning, and to inform my investigation of the experiences of young people in existing literature. To find young people's accounts of their self-tracking practices, I performed a literature search for qualitative work about (1) young people's use of digital menstrual tracking tools, and (2) young people's digital self-tracking more generally. Most of the articles I located for the first literature search were studies of menstrual tracking that included young people in the participant groups, and articles in the second search were largely about young people's experiences of health and fitness tracking. I chose articles that included young people's first hand accounts of digital self-tracking.

The resulting literature includes 6 articles in which participants discuss their menstrual tracking [5,6,14,21,31,32] and 11 in which participants discuss fitness tracking [9,15–20,33–36]. First-hand accounts in the menstrual tracking literature were mostly gathered via qualitative interviews, with one [31] being autoethnographic. Methods were more diverse in the fitness tracking literature: interviews [18,19,35,36], focus groups [15–17], a qualitative survey [34], and, in three studies, a mix of methods including interviews, focus groups, and other qualitative participatory methods [9,20,33]. Participants in the menstrual tracking literature were generally older (18–40 years) than in the fitness tracking literature (11–31 years; in three fitness tracking studies [15–17], all participants were under 18).

I extracted young people's first hand accounts of their embodied experiences of fitness and menstrual tracking practices from the literature, particularly focusing on direct quotes. I gathered quotes from participants aged between 11 and 25 years (inclusive) to reflect the ages of participants in the subset of studies *specifically focused* on young people [9,15–17,19,20,33–35]. For the remaining studies in which young people were included in a general participant pool, I extracted quotes from participants aged 25 years or younger.

2.3. Analysis

I applied a critical lens to my data, informed by my self-tracking experiences, and using aspects of pattern-based discourse analysis [23]: reading and re-reading the quotes from young people from my literature review and viewing and reviewing my screenshots and observations in order to seek out and identify patterns of meaning [24], focusing on what practices, experiences and discourses do. I selectively coded the data into themes. From a feminist new materialist perspective, these themes could be considered "agential cuts" [37] (p. 168): constructing particular boundaries of meaning from the infinitely many meanings present in the data and in my entanglement with it [10]. The resulting four themes are discussed in each of the four subsections of the Section 3 of this paper. I begin the discussion of each theme with an autoethnographic paragraph, with the aim of adding depth, context, and a sense of story to each section. As I am not a young person, my autoethnographic framing is a poor substitute for the words of young people, whose experiences may be different from or even contrary to my own. It is my intention that this work will act as an initial exploration and a starting point from which to inform future research.

3. Findings and Discussion

3.1. Health and Beauty Enmeshed and Entangled

[Note: I have italicised paragraphs which are purely autoethnographic and reflect my experiences and thoughts]. *When I first installed my period tracking app, I was taken through an onboarding questionnaire to establish my goals for my body. I was asked about my conception intentions, and questions about my period, but also about my sleep, my mental health, my sex life, my fitness goals, and my skin. In response to my answers, my tracker prompted me to pick topics for ongoing help and advice. During this onboarding process, my tracker and I began to create*

the shape of our interactions: the things about my body that my tracker would remind me to pay attention to, and the body work I would engage in in service of these goals. One of the topics I chose was about achieving and maintaining clear skin, and so from time to time, my tracker reminds me of this. I'm asked about the food that I eat and my exercise and beauty regimes. I'm instructed to check my beauty products for pore-clogging ingredients. I'm given tips on changes I can make to my diet—foods to eat, foods to avoid—to improve my skin. I can log acne in the daily 'symptoms' screen of my tracker, and each month my tracker looks for patterns in my cycle and potential hormonal explanations for my bad skin.

The way I think about and experience my skin with my period tracker is situated somewhere in and between health and beauty. These ideas, and the ways I experience and relate to my skin, blend and become enmeshed: bad skin is a 'symptom', for which I'm offered biological, hormonal explanations [8], but I work on it because I think clear skin looks better; my desire for clear skin aligns more with my appearance concerns, rather than any specific health concerns. When I consult my period tracker about my skin, I'm thinking about my appearance with my tracker in the language of health. My tracker, my skin, my period, my hormones, my exercise and beauty regimes, and the food I eat all become part of a health-beauty assemblage [38]—a complex entanglement through which my embodied experience of my skin is "materiali[s]ed and brought into being" [14] (p. 58).

In her study of menstrual-tracking app users, some of whom are young (participants were aged between 24 and 38), Andelsman [14] notes that one participant "tries to attune her diet and exercise routine to the app's recommendations for each phase [of her cycle]" (p. 64). Users are encouraged to eat particular foods to ease 'symptoms' they are told to expect at different phases of their cycle; to work out according to relative levels of strength and energy attributed to cyclical hormonal fluctuations. When onboarding with my tracker, I was asked about my fitness goals and was given eight options to choose from, half of which were about weight or eating, including a goal of losing weight. 'Fitness' in this context feels like a euphemism for achieving an ideal or acceptable body; the "attainment of normative femininity" [3] (p. 39). There is a fuzziness as to whether tracking apps' diet and exercise advice is about health, or beauty, or both. App users, including young people, can utilise apps to track and monitor their bodies' deviation from health and appearance norms and work to bring them closer to these standards [3,4,8]. Sanders [3] notes the ways in which patriarchal standards of beauty and heterosexual desirability often align with standards of health in self-tracking practices. Talking about her menstrual tracking practices, Roetman [31] says: "when I log a bout of acne or weight gain, I immediately receive instructions on how to 'fix my symptoms' from the app . . . [it] instructs me to do specific exercises, to eat vegetables, to change my sleeping schedule, and even to engage in sexual intercourse as 'stress relief'" (p. 2); through tracking and the recommended body work, then, the delineations between health, appearance, and desirability become indistinct. Roteman remarks on how her 'fertility' and sexual availability are central to the construction of her body with and through her menstrual tracking app (see also [4]).

A notable aspect of the accounts in [14,31] and in my own experience is how closely knitted menstrual health, appearance, and 'fitness' practices can be and become in digital menstrual tracking, one part of a larger constellation of body work practices. The blurring of the boundaries of health and beauty are often more salient in fitness and calorie tracking, and this is reflected in studies of young people's use of these tracking tools. Some of the adolescents in the study of Goodyear and Armour [33] of young people's experiences with and perspectives on digital health tools, for example, directly conflated health and body size, with health being seen as synonymous with slimness, and tracking apps as tools to regulate and measure calorie intake and exercise in order to maintain a slim/healthy body—to "help you improve and be healthier", in the words of a 17-year-old in another study [34] (p. 8). One participant in [15], when probed about what healthy meant, bluntly stated "not fat" (p. 218). The ways in which young people in these studies relate to and situate health and fatness is perhaps unsurprising, given the modern obsession with 'obesity' as a self-inflicted state of ill health [39] that simultaneously violates ideals of femininity [3]

and which must be constantly and vigilantly guarded against, with fat as “threatening abstract flesh which can grab onto [one] materially anytime without continuous rejection and management” [40] (p. 101). [9] reports that the adolescents in their study used digital technologies along normative *gendered* standards of appearance, with boys tending towards tools to increase muscularity and girls tools for dieting and weight loss. Adolescents are obviously aware of and define their subjectivities in relation to dominant discourses of (gendered) health and appearance.

Health/appearance standards and young people’s relationship to them may be experienced as something that is *felt* in self-tracking practices. Some of the 13 and 14 year olds in [15] made reference to fatness/slimness in terms of affect: “it makes you **feel healthier**”; “it makes you **feel slimmer**” (p. 218, emphasis added); “you sit there and realise it’s seven o’clock and you’ve got like ten steps and you **feel really bad**”, “it makes you **feel fat**” (p. 220, emphasis added). Through and with self-tracking practices and tools, fat/slimness, health, and beauty are states with a strong affective dimension.

Users of digital self-tracking tools are not unreflexive cultural dupes or unthinking automata [41], passively absorbing instructions: Roetman’s [31] account, for example, is a critical one. Young people can be reflexive when it comes to their experiences of health/beauty in their self-tracking practices, and critical of the blurring of health and appearance norms in self-tracking apps, drawing their own boundaries about what is ‘healthy’ and what is not. According to one 14-year-old boy, when reflecting on fitness apps:

I think, in society, one of our main values is how we appear physically, and people go so far just to maintain their physical appearance. And of course, being healthy on the inside is something that I think is really important—there’s a limit, there’s a fine line between going too far and developing an obsession with fitness, and then just being healthy. [20] (p. 5)

And in the reflections of a 14 year old girl:

[The apps] made me want to eat less which is not good. So I stopped using those apps because I just didn’t think they worked for me the way that they were supposed to . . . I feel that a lot of those apps are focused on losing weight rather than a healthy lifestyle and they don’t really give any tips for a healthier lifestyle. [35] (p. 6)

Young people can consciously monitor their own self-tracking practices to avoid behaviours that they judge to be harmful. They can express a scepticism towards, or rejection of, normative gendered standards of health/appearance: “you can’t really define a normal ideal weight, obviously people have different perceptions of what it is”, noted one participant in [16] (p. 108).

3.2. *The Body as the Locus of Stress, Mood, and Sleep Problems*

In my period tracker, I log my mood (am I calm, happy, sad, anxious, depressed, having obsessive thoughts?), stress, and ‘symptoms’ like fatigue or insomnia. I consult charts of my daily activity and sleep, imported from my fitness tracker, and see whether I’m meeting the app’s targets of 10,000 steps a day and eight hours sleep a night. My period is marked on the charts to help reveal any period-associated pattern in my sleep or activity level. My fitness tracker has more fine-grained data: most mornings I consult it to see how I slept the night before—how many hours of light, deep, and REM sleep I got, how often I was awake and for how long, what percent of the night my heart rate was below resting. I get a numeric score and a rating (e.g., ‘fair’, ‘good’) for each night’s sleep. Sometimes I look at my stress score, which is calculated on the basis of my heart rate, my activity level, and how I’m sleeping. Some components of the sleep and stress metrics are under my direct control (e.g., my daily activity) and some are not (e.g., how much REM sleep I get). They can be frustrating metrics, and difficult to improve by conscious effort alone. Both trackers give me advice on how to improve my sleep, my stress, and my mood. I’m counselled to engage in mindfulness, to adjust my exercise routine, and to pay attention to my sleep to improve my stress levels. To combat fatigue and improve my sleep, I should eat or avoid certain foods, meditate, and make changes to my

evening routine. My period tracker seeks patterns in when I'm fatigued, and potential hormonal explanations—at certain points in my cycle it prompts, do I feel more fatigued?

Polzer et al. [8] note that by offering individualised, hormonally based explanations for embodied experiences such as stress, these bodily states are positioned as something that can be fully explained and understood by hormones and menstrual cycles, and fixed by careful attention to things like sleep, food, and exercise. The body is framed as the ultimate locus of stress, mood, and sleep, which are positioned as purely personal health problems to work on, dislocated from the wider structure and society. Many bodily states are attributed to hormones in period tracking apps, from energy to productivity to sociability [14].

These biological/hormonal attributions can be brought into being when users of apps accept the explanations offered for their embodied states as plausible. In the words of one 21 year old:

I didn't know that there were people who had a certain appetite, for example, sleeping more or were more tired, or felt like something sweet or salty, I didn't know that, so I've learned that with it [menstrual app], that, like that you have more [sexual] desire, so I am, I have always been ignorant concerning those things. [21] (p. 6)

This quote illustrates the way in which embodied experiences, like increased sexual desire, tiredness, or food cravings can be recognised and *produced* via young people's app use. My period tracking app gives me daily predictions about how I may feel, prompting me to introspect as to whether I am feeling fatigued or experiencing mood swings. It tells me that other people often feel this way at this point in their cycle, and it asks whether I feel that way, too.

Young people must navigate healthism [39] and the responsabilisation of health and wellness when using digital self-tracking tools. This is neatly encapsulated in the comments of one young woman in Depper and Howe's [16] research into young people's use of fitness trackers: "individual people are responsible for their own health" (p. 105). However, despite this view being prevalent among the young people in this study, many participants also found the fitness tracking apps to be too individually-focused, removing what they experienced as the fun, social aspect of sport and fitness. Young people may accept or reject healthism and responsabilisation to varying degrees, or do both simultaneously:

I will never forget the day when it [menstruation] was 18 days late according to what the app told me. It wasn't the fault of the app but the fault of my body, but ... because also we had exams and the stress. [21] (p. 5)

For this 23-year-old, while her body was at 'fault' for a late period, so too was stress, attributed in this case to exams. While she accepted the app's attribution of her late period to internal, biological factors ("my body"), simultaneously she looked beyond this explanation for additional social factors ("exams"). Young people have access to a range of discourses and resources with which to situate their experiences, digital and non-digital, human and non-human [9]. A question that cannot be answered by the current article but bears asking: for the young person in [21] and others like her, how much of the blame that her body bears is due to gendered constructions of the menstruating and fertile body as inherently difficult and chaotic [8]? More generally, what role do experiences of gender play in how young people attribute bodily states like stress to internal versus external factors?

3.3. Feeling More Real through Tracking

Despite often feeling sceptical about the skin advice that I get from my menstrual tracker, I still tap the acne icon to document and record instances of 'bad skin'. I don't expect that my tracker will divine a pattern or offer any novel solutions, but somehow it feels as though the experience or memory of bad skin might somehow slip away if it is not documented. I feel this sense of 'realness' much more strongly with my fitness tracker. One of the reasons I bought my fitness tracker was to check how effective my workouts were, whether they really 'counted': does my heart rate get and stay high enough to constitute a 'proper' workout? Now, I track my 'active minutes' (where my heart

rate is above a tracker-defined level), with daily and weekly goals. Exercise that doesn't produce active minutes that I can see and examine does not 'count' somehow; does not feel really 'real'. Some types of exercise rarely 'count' in my fitness tracker, such as weight training. I can manually log this type of exercise, so that I have a record of it, but the fact that it does not generate (many) active minutes and is not automatically noticed and documented by my tracker means that sometimes it provokes a sense of anxiety that I haven't really done much 'real' exercise. I have to remind myself that my sweat and my aching muscles are my proof, my documentation.

Tracking can make bodily processes and sensations feel more 'real'—when they are documented, quantified, and visualised, and when we have visual 'proof' of our experiences, expressed in ways that can feel authoritative via an aura of science and objectivity [42]. We measure, quantify, and transmute bodily sensations, processes, and blood into numbers, charts, and data with and through our tracking apps, "render[ing] aspects of a private, subjective, and somewhat inaccessible world of feelings and problems more tangible and comparable" [14] (p. 57).

Digital renderings of bodily processes can, in some cases, make young people feel seen, and offer a way for them to make sense of their bodies. One 18-year-old in [21] reported that using her period tracking app and seeing symptoms represented visually made her feel "understood" (p. 6). For some people, menstrual trackers helped them feel more "in touch" [14] (p. 61) with their bodies, making their cycles feel more predictable, and providing explanations for "things that are happening to" their bodies (p. 62). For one young woman, tracking her emotional states in her menstrual tracker allowed her to assess her mental wellness and look for patterns and possible (biological, hormonal) explanations for her emotional states [32]. She said she relied on her tracker because she felt her "brain can't be relied on to know what's happening" (p. 6). The perceived objectivity of these digital bodily traces means they can be used in medical settings, where a young person and their doctor can inspect the traces for meaning together. Two young people in [6] report using their trackers in this way:

Lisa said that they are taking medications that change their cycle and sex drive, and when discussing adjusting dosages with their psychiatrist, found it helpful to have "an objective set of data that I can refer to." Likewise, Sylvia said she found her period-tracking app's calendar function to be helpful when medical offices ask when her last period started (p. 57).

Fitness trackers can be used by young people in similar ways. They can be a memory tool, to document, see, and remember: for one young woman, her fitness tracker allowed her to see how far and how often she had run, providing reassurance and comfort that she was meeting her goals [16]. Fitness trackers can be used as diagnostic tools to divine reasons for bodily sensations; for one 22 year old:

[If] my feet or legs or anything are in pain I normally look it up and see, did I do a lot of steps today or something like that. To, kind of, go, oh, okay, well, that's understandable. Like, I guess it helps me find a reason as to why and when my legs and feet hurt". [19] (p. 8)

They can be used as sources of motivation and encouragement, with one tertiary student in [18] describing how seeing how far they had run provided the proof that they could run further. A tracker's account of a bodily experience may be privileged over that of the user: in [20], a mother recounts a time when her adolescent daughter told her that she did not sleep well. According to the tracker, she had "actually slept well", so the mother concluded that her daughter "didn't actually have a bad night" (p. 6), prompting her to search for another explanation with her daughter for the fatigue she was experiencing.

In these accounts, the data renderings of bodily processes are often constructed as more accessible, tangible, real, and, in some cases, more trusted than the knowledge available in other ways (for example, via embodied introspection of bodily sensations). Lupton [42] notes that "digital data objects" are often presented as though they are produced scientifically, and are therefore more "objective, complete, and neutral" than other ways of

knowing (p. 101). Polzer et al. [8] observe that menstrual tracking app marketing often leans into this by positioning the body as mysterious and difficult to know and understand. They argue that apps both create a problem and offer the solution at the same time—our bodies are confusing and mysterious, but menstrual tracking apps will empower us through data, enabling us to wrest back control from the chaos (note that this framing is a particularly gendered one, resting on conceptions of the chaos of the (fertile) *female* body). Rather than neutrally observing and reporting reality, however, tracking data, in conjunction with the human user, brings reality into being. There are additional and often unseen others in this tracking assemblage: the designers and developers of the digital trackers, who shape what data is recorded and how it is presented [42].

Some young people resist the authority of their trackers when the data it presents does not seem to match their experience of the world: when data is not perceived as being accurately captured—such as fitness trackers that cannot detect swimming [33] or weight training [9]—it can be experienced as disappointing and frustrating, and lead them to distrust and reject their trackers. In these cases, the perceived realness of the digital renderings is broken, and the utility of the tracking device is therefore diminished. In other cases, trackers may be rejected outright, such as, for example, where young people are more inclined to trust their own perceptions over those offered by trackers: one tertiary student in [36] notes: “I’m a pretty good self-monitor of myself. I don’t need a piece of technology telling me” (p. 808).

3.4. Mutual Shaping

My relationship with my menstrual tracker is ongoing and evolving. I track the bodily processes and sensations that are salient to me, with a particular focus on the things that bother me. On the basis of these, my tracker offers me daily chats, with advice and tips, and prompts me to log specific symptoms that it predicts I might be experiencing: are you feeling bloated today? Are you fatigued? In response, I tell my tracker whether these predictions are correct. Together, we define the shape and the course of our interactions.

There is—to an extent—a reciprocity or a mutuality in the ways in which self-tracking tools and their users shape each other in their engagements. There is some personalisation in the advice I am offered by my menstrual tracker: if I had filled in the onboarding questionnaire differently, or if I start to log particular ‘symptoms’ regularly, my tracker would start to give me different advice. In this way, bodies and apps co-constitute each other, “[materialising] through their entanglements with one another” [14] (p. 58), constantly changing and rearranging. The young people in [18] reported that their fitness apps “motivated them, coached them, and even sometimes guilted or shamed them” (p. 228) into achieving their fitness goals: their goals set the parameters for the coaching they would receive, which in turn influenced their progress towards those goals.

The mutual shaping in self-tracking apps is largely asymmetrical, though. When I use my tracker to log ‘symptoms’, while it requires both my participation and my careful attention to identify and categorise my bodily sensations, this categorisation is bound by a symptom taxonomy defined by my tracker. Embodied experience is sorted into app-defined boxes. The standards against which I am measured are also largely defined by my tracker: I receive green ticks for cycle and period durations when they fall within the tracker’s bounds of good/normal/regular [14]. Badges of achievement or compliance can contribute to the pleasure of using digital self-tracking tools for young people: “it makes you feel good if you reach the target” [15] (p. 218), “[it’s] a satisfying feeling when the watch vibrates and it gives you the little fireworks and stuff” [9] (p. 37), etc. When young people fail to meet these targets, it can elicit feelings of disappointment, frustration, guilt, and shame [18].

There is asymmetry in what is shared and what is withheld in people’s relationships with their trackers: there is little transparency in the algorithms that underlay cycle and fertility predictions in menstrual tracking apps, for example [4,43], and minimal transparency about the ways in which user data is sold and used for marketing [4,5,8,43]. A tracker may

ask its user to be diligent in logging a large range of ‘symptoms’, and be open about their body, but it can be quite coy in return.

Young people in [34] were resistant to teachers and school leaders accessing their fitness data. In terms of other types of data access and use, however, while some young people are aware of the informational asymmetry in the interactions with their apps, many seem accepting of, or perhaps resigned to, it. While most participants in [5] (some of whom were young: participants were aged between 18 and 39) considered their period data uninteresting and were unconcerned about how it may be used, some found its collection and use distressing. Of these, some rationalised this as a trade-off for the usefulness of their period tracking app. One young woman in [19], reflecting on the use of her personal data for marketing purposes, said: “I think it’s just society today—I can’t really stop it” (p. 10).

4. Conclusions

Digital self-tracking tools, including menstrual tracking and fitness tracking tools, can be part of body work practices towards idealised versions of the self. In this paper, I have explored some of the ways in which health, beauty, and wellness can blend and become enmeshed in self-tracking practices; how emotional states, sleep, and stress can be experienced as primarily personal problems to solve, dislocated from the social and structural; how body work can seem more ‘real’ when it is documented, quantified, and visualised with digital tracking tools; and some of the ways in which digital tracking tools and their users are mutually, but asymmetrically, shaping. I have found evidence that young people experience and relate to each of these discourses, approaching them from a range of perspectives from accepting through to ambivalent and critical.

Limitations and Future Directions

In this research, I have used my own tracking experiences to orient myself to patterns of meaning in data about young people. However, because I am not a young person, the patterns that I perceive and experience may be different from, or even contrary to, those seen, felt, and experienced by young people engaged in self-tracking practices. Similarly, most of the qualitative research into menstrual tracking apps that I have used in this article is not focused specifically on young people but rather includes young people within a larger participant pool, drawing findings from study participants without regard for age. In general, there is a paucity of research on young people’s embodied experience of digital menstrual tracking. Future research should seek the voices of young people directly and specifically.

As noted in Section 2.2, participants in studies of menstrual tracking practices used in this article are systematically older (18–40 years) than those in fitness tracking studies (11–31 years). Therefore, defining young people as those aged 11–25 years, as I have in this article, elides and obscures patterns of differences in the experiences of people of different ages, and risks conflating the fitness tracking experiences of children and teenagers with the menstrual tracking practices of adults. With regards to menstrual tracking, for example, experiencing a menstruating body likely differs for young people for whom menstruation is a new experience versus those who have experienced it for a decade or more; menstruation may also have very different meanings for those who are sexually active versus those who are not. Despite this limitation, I was able to identify common themes in the data, but, again, differences may be teased out in future research focused *specifically* on young people’s digital menstrual tracking practices.

Fertility [4,31] and the “expectation of reproductive citizenship” [5] (p. 3) are central features of the construction of femininity in digital menstrual tracking tools. Future research could interrogate young people’s experiences with relation to this norm: how do young people, for whom there is an expectation of *avoiding* pregnancy [44] relate to the construction of their bodies as fertile and always potentially pregnant [4]?

In this article, I have focused on the similarities between fitness and menstrual tracking, and the ways in which they can be part of a larger constellation of digital body work prac-

tices. Future research could draw out the dissimilarities and differences between menstrual tracking and fitness tracking practices, in the context of young people's body work.

With regards to hormonal, biological explanations of embodied experiences like stress, future research could ask: how much of the blame that bodies bear is due to *gendered* constructions of the menstruating and the fertile body as inherently difficult and chaotic [8]? What role does gender play in how young people attribute bodily experiences like stress, mood, and sleep to internal versus external factors?

Similarly, future research could usefully interrogate whether experiences of gender play a part in the acceptance or rejection of data in, and explanations offered by, digital tracking tools. If female bodies are perceived as inherently more chaotic and difficult to know and understand [8], are external accounts, such as those offered by digital tracking tools, more trusted than understandings generated from embodied experiences?

In this article, I have found body work can seem more 'real' when it is documented, quantified, and visualised with digital tracking tools. For those young people who have grown up with digital tools deeply enmeshed in their day-to-day lives, is this feeling stronger? Or do they have a reflexive scepticism of the authority of digital tools? Or do they experience these tools in another way?

Finally, in this article, I touch on the asymmetry of information flows between tracking apps and their users (discussed in more depth in [4–6,8]). Future research could consider how young people's knowledge and perceptions of data gathering by digital tracking tools affects their perceptions of privacy and experiences of safety. This may be particularly relevant with regards to menstrual tracking in jurisdictions where access to abortion is restricted or has recently become so, such as the United States [45]. For young people in these jurisdictions, how does the (il)legality of abortion affect their menstrual tracking practices, and the affordances and capacities offered by menstrual tracking tools? Do tools become a source of fear and anxiety? Do practices entail secrecy?

Despite the myriad limitations of my work, it is my hope that this article will add to the field of study of body work through self-tracking practices, and, in particular, that the themes I have identified may point towards some future directions into young people's experiences of digital body work. To date, there is very little qualitative sociological research into young people's use of digital menstrual trackers. I hope to have offered some tentative inroads into this subject and demonstrated the potential for future research into young people's embodied experiences and how these can be brought into being with and through the use of digital self-tracking tools.

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