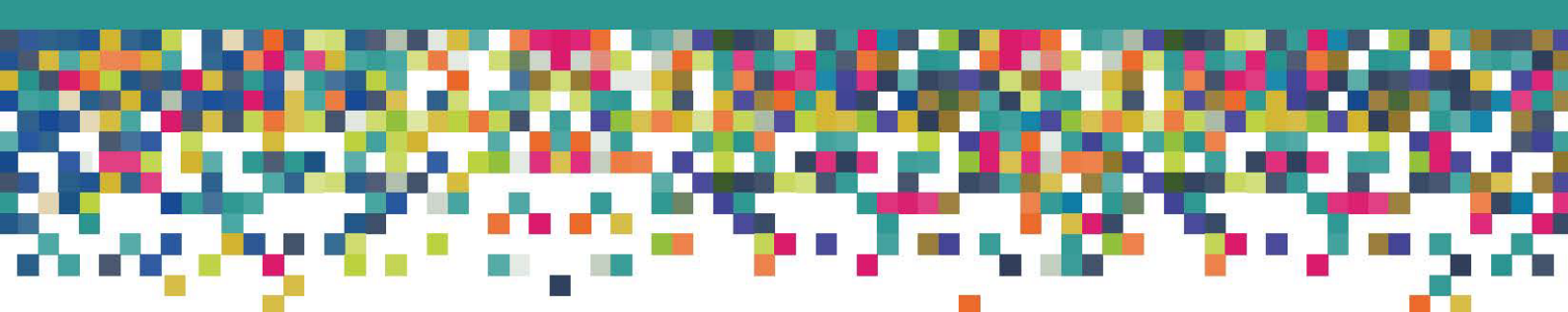




Media and
Communications

Media@LSE MSc Dissertation Series

Editors: Bart Cammaerts, Saumyadeep Mandal and Hao Wang



THE APP KEEPS THE SCORE

Period-Tracking Apps, Self-Empowerment and the Self as
Enterprise

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Published by Media@LSE, London School of Economics and Political Science ('LSE'), Houghton Street, London WC2A 2AE. The LSE is a School of the University of London. It is a Charity and is incorporated in England as a company limited by guarantee under the Companies Act (Reg number 70527).

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ABSTRACT

This dissertation focuses on understanding how users' self-perceptions of empowerment and bodily autonomy are engendered and engineered through the use of period-tracking apps. At present, research into this area is expanding, supplementing an existing body of literature on the ramifications of self-tracking and the type of user this generates. However, through a review of the literature, a gap has been identified in the situation of user experiences within a broader societal context that factors datafication, surveillance capitalism and neoliberalism into its exploration of the topic. Thus, this dissertation aims to provide an account of how the use of these apps affects a user's self-perception of bodily autonomy and empowerment whilst considering these platforms as businesses which obey the imperatives of Big Data. To do so, a thematic analysis of twelve in-depth semi-structured interviews was carried out. The findings of this study point to the use of period trackers as yet another tool to manage the neoliberal project of the self and, the body, a site of app-mediated surveillance, becomes commercialised in order to be datafied, turning into a commodity which is useful and controllable. The apps' murky data collection practices made many of my subjects cynical of their use. However, this wasn't enough to counter the imperative to track and the appeal of making their body more predictable and efficient. Though this study may constitute an expansion on pre-existing work at the intersection of user experience, self-tracking and women's health, it remains a first step into critically understanding how the incorporation of these platforms builds a sense of 'selfhood' in its users. As such, more research needs to be carried out into understanding the role of period-tracking apps in today's wider data ecology and how these participate in the construction of users' inner lives amid practices of massive data extraction.

INTRODUCTION

On a Friday morning in June last year, the U.S. supreme court decided, with a 5-4 vote, to overturn *Roe v. Wade* which, only 49 years prior, had marked abortion as a protected right under the United States constitution. The decision had rapid and seismic outcomes: many conservative states moved to make severe restrictions on women's abortion rights with some (like Mississippi) even possessing pre-existing 'trigger laws' (i.e. laws that only go into effect when a change in circumstance occurs (Texas Law Library)) to ban abortion as soon as *Roe v. Wade* was overturned (Hurley and Chung, 2022). This left women in search of an abortion with the option of travelling to a state where it was legal to get one, buying abortion pills online or subjecting themselves to an illegal procedure (Hurley and Chung, 2022). Shortly after, as the decision's reverberations began to materialise, privacy experts began warning users to exercise caution with their period-tracking platforms, suggesting that these may be used and even weaponised against those receiving an abortion in states where it was not legal to do so, putting populations of women and other vulnerable users at risk for harm (Torchinsky, 2022). Period-tracking apps are platforms which allow users to track their menstrual cycle and their associated symptoms. Though they are designed with the intent of helping women make sense of their cycle, their existence has not been wholly uncontroversial and they have previously come under fire both for selling sensitive health data as well as through debates concerning the safety of their data practices (Merken, 2021). Consequently, after *Roe v. Wade* was overturned, users began to worry that location data used by the app could betray their whereabouts (were they to find themselves in an illegal abortion clinic, for example) or that their period tracker could soon become 'a target for investigators', with courts being able to subpoena any app on a user's phone, especially if their data isn't stored locally but on a cloud (Garamvolgyi, 2022; Torchinsky, 2022).

Though these abortion-related concerns are newer, period-tracking apps have been the subject of study since their inception in the early 2010s. Though a lot of attention has gone into investigating self-knowledge and education, app data privacy and transparency practices as well as the consequences of quantifying the body (e.g. Amelang, 2002; Bhimani, 2020; Worsfold *et al.*, 2021 etc.), the relationship users foster with their platforms has yet to be expanded into exploring the construction of the neoliberal, health-conscious subject through

period-tracking apps, which will be the subject of this inquiry. To my knowledge, Ford *et al.* (2021)'s investigation on surveillance capitalism and period-tracking apps is one of the only instances in the literature exploring the phenomenon of datafication and massive data extraction in conjunction with period-tracker use. As the intersection between these areas remains relatively untapped (despite the scale and pervasiveness of these phenomena), this dissertation intends to take some of the ideas laid out in Ford *et al.*'s study further: analysing how surveillance capitalism and period-tracking influence the construction of a neoliberal subject in the context of women's health. Through 12 in-depth interviews with users about their period-tracking habits, I carried out a thematic analysis to locate trends in user subjectivity throughout my sample. This was done in an attempt to understand how period-trackers can act as a poignant case study for the ways digital platforms and datafied selves influence a user's view of their own health and their own subjecthood.

To explore these issues, this study will begin by laying some groundwork on period-tracking technologies and their social significance: this will include recent trends in eHealth and an exploration of the promises of empowerment made by the companies behind these platforms. After these are connected to the broader imperatives driving the Big Data business model, this study's methodology will be outlined. This will be followed by an exposition of its results and their interpretation in light of the information outlined in the literature review. Finally, a conclusion will summarise the findings and lay out some limitations future research can build and improve on.

LITERATURE REVIEW

Period Technologies and the Coming of eHealth

Period management technologies have existed for centuries (Stone, 2023: 316-317) but it wasn't until the beginning of the 20th century that the shift towards articulating a 'modern' body' (Freidenfelds, 2009: 120) in the way we understand it began to take place. This was largely kick-started through mass-advertisement campaigns in America during the 1920s and 30s for new menstrual technologies like sanitary pads (and, at first, to a lesser extent, tampons), which were being increasingly used by women (Freidenfelds, 2009: 121). For the first time, this shifted menstrual management from the 'hands of those who menstruate' to large

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corporations (Stone, 2023: 321). The consumer goods they produced were touted as a necessary means to achieve “modern’ womanhood’ (Freidenfelds, 2009: 123) and because of this were being zealously taken up by middle- and upper-class women. As part of ‘modern womanhood’ also included abiding by newly-instituted ‘industrial work schedules’ (Vostral, 2008: 6), women began to incorporate period technologies into their daily practices to keep their ‘fluctuating body’ under check in the workplace (Vostral, 2008: 11). As the ‘presentation of the self’ became inextricably tied to the body, which begun to be conceptualised as a ‘project’, it became important to control one’s bodily processes and desires as well as ‘civilising’ one’s physical self by means of rationality and control (Turner 1994: 14; Lupton, 1995: 8). These new tools constituted a ‘microperformance’ of gender, effectively enabling women to act more like men and endowing them with unprecedented agency over a body which had primarily been defined through its differences to the male one (Vostral, 2008: 61; Stone, 2023: 316). Importantly, the significance of controlling one’s period did not merely extend to the realm of self-care, but represented a veritable pursuit of ‘social success and integration’ (Lupton, 1995: 8-9).

Nowadays, period-management ‘technologies’ have largely been normalised and adopted widely in the Global North for the past four decades or so (Freidenfelds, 2009: 120). The demand for period-management products and the aspirational pull towards a ‘well-managed body’ (among other things) have set the foundation for a new iteration of menstrual technologies to emerge and cater to a new set of necessities: period-tracking apps (PTAs) (Freidenfelds, 2009: 125). These applications can be downloaded onto a mobile device and allow users to holistically track both their menstruation as well as any ‘associated symptoms and signs’ that may accompany it (Levy, 2018: 108). PTAs can be said to belong to a larger category of applications known as ‘eHealth’. The latter can be broadly defined as a healthcare delivery method which uses information technologies (such as phones and computers) to support patients in ‘health-related fields’ including monitoring and surveillance, health education, treatment etc. (Kluge, 2020; WHO). Due to its cost-effectiveness and geographical reach, this way of deploying healthcare is being used increasingly in areas where there is no or little access to it (Kluge, 2020). In 2022, the global eHealth market was estimated to be worth around 100.4 billion US dollars and, due to the burgeoning demand for these platforms, this

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is only projected to become larger, reaching an estimated worth of \$304.2 billion by 2028 (a near three-fold increase from 2022) (IMARC, 2022).

Consumer demand for PTAs has also risen, with the COVID-19 pandemic marking a positive turning point for the market. In the upcoming 4 years or so, the projected compound annual growth rate (CAGR) for these applications is expected to be as high as 17.9% (Mordor Intelligence, 2023). Several factors can account for this, including an increased awareness around hormonal and menstrual health, government intervention to inform people who have periods about menstrual hygiene and the integration of period-tracking platforms onto 'smart wearables' (Mordor Intelligence, 2023; Grand View Research, 2022). However, the growth in PTA uptake is mostly segregated to the Global North, with South America, Africa and parts of the Middle East presenting low growth rates. At present, a few key players dominate the PTA landscape (Mordor Intelligence, 2023). Flo is currently the most widely-used period-tracking platform and possesses a community of over 230 million users as well as being available in 22 different languages (Flo, 2023a). The app encourages users to 'Become an expert on you' through the various medically-accurate educational resources available on its interface, curated by a team of '100+ health and well-being experts' (Flo, 2023a). Flo also partners with research teams by supplying them with a stream of 'aggregated and anonymized medical data' (Flo, 2023b) to help the advancement of women's health studies. Despite their emphasis on the latter, Flo takes an 'intersectional approach to inclusion' and acknowledges that 'not all people who menstruate are women, and not all women menstruate' (Flo, 2023c), thus committing to recognise the importance of gender diversity and representation, albeit 'where space allows' (Flo, 2023c). The other big player in the PTA arena is Clue. Boasting 11 million active monthly users in 190 countries, this app promises self-knowledge through living 'in synch with your cycle', which can be obtained by noticing patterns, receiving predictions and self-tracking over 30 metrics (e.g. mood, energy etc.) (Clue, 2023a). As with Flo, Clue doesn't merely act as a PTA, but also allows users to educate themselves in matters that pertain to their hormonal and menstrual health through articles written by 'medical experts' (Clue, 2023a). Clue even features an 'Encyclopaedia' section on its website which acts as an archive for past articles written by clinicians on a spectrum of topics ranging from fertility to 'life and culture'. It also hosts a podcast about hormones and webinars to educate medical professionals (Clue, 2023b; Clue, 2023c) (Clue, 2023d).

Furthermore, Clue's paid subscription plan, Clue Plus, allows users to access five different 'modes' through its interface, namely period-tracking, birth control, conceive, pregnancy and postpartum; designating the app as a centralised and highly personalisable platform that goes 'with you through it all' and gives 'women a really powerful way to understand what's going on in their bodies' (Clue, 2023e; Lomas, 2015).

Self-tracking: Seeking Self-knowledge, Self-Empowerment

The self-tracking movement represents a push towards better a knowledge of one's self as well as a sense of heightened autonomy (Sharon, 2017: 94). This is epitomised by the followers of the 'Quantified Self' movement whose unofficial dictum 'I am what I track' (Sharon, 2017: 115) emphasizes a more individualised and personalised healthcare model – one that focuses on prevention and participation through large-scale data collection (Sharon, 2017: 95). Continuous tracking enabled by mobile applications like PTAs gives users the bigger picture in terms of their health – rather than measuring at intervals during medical visits, each self-tracker is able to create a personal dataset which is much more comprehensive and detailed than had been possible under 'traditional' healthcare (Sharon, 2017: 100). Consequently, these applications promote a flavour of 'techno-utopia' (Davis, 2012: 956) through a rhetoric of self-empowerment, in that they allow anyone who uses them to gain agency over their health; and self-knowledge, in that they allow for an unprecedented understanding of one's body through datafied insights (Sharon, 2017: 97, 103). Thus, there is inevitably a prescriptive dimension to PTAs as they instrumentalise what types of knowledge are collected and, also, *worth* collecting (Mehrnezhad and Almeida, 2021: 1). Consequently, these platforms cannot be said to be either 'neutral or objective' (Haas, 2012: 288) in what kinds of data they collect. Because of this, it becomes important to question *who* these apps are designed for and who is left out, intentionally or not (Rose, 2016: 428). This is especially important in light of the fact that, to some extent, all public health initiatives aim to normalize a specific type of user (Lupton, 1995: 11). Thus, the quest for knowledge about one's cycle through PTAs, a digital mirror-reflection of the self, is promoted by the imperatives for 'self-examination, self-optimization and personal responsibility' which manifest themselves through what Foucault terms 'practices of the self' (Sharon, 2017: 104; Ford *et al.*, 2021: 49; Lupton, 1995: 12). These amount to the internalisation of disciplinary power, which Foucault uses to denote a modality of power

which endeavours to render the body 'more obedient as it becomes more useful, and conversely' (Foucault, 1979: 138). As a consequence of this, the 'self' becomes an ongoing 'ethical project' (Lupton, 1995: 12), aided by continuous self-surveillance facilitated by platforms like PTAs (Ford *et al.*, 2021: 49). The maintenance of one's health as the maintenance of one's identity and the moralisation of these practices all fall under the umbrella of healthist discourse. This portrays the ideal citizen as one who is self-responsible and embraces technology to seek the 'security and stability' of a healthy body (Lupton, 2013: 397, 398). Therefore, another large change brought on by these and other eHealth apps is a shift towards the belief that health is an individual responsibility which must be looked after for the sake of the 'collective good' (given that good health entails fewer financial costs to society, for example) (Sharon, 2017: 100). Similarly, the progression of medical research is also a matter of personal initiative and action. In the purview of PTAs, the user becomes an active contributor to the establishment of women's health by willingly offering the data profile they have produced through their usage of the app to medical and other third-parties (Sharon, 2017: 101). Importantly, the once passive patient, who was the recipient of healthcare, now actively positions herself as a producer as well as a consumer of knowledge; a 'prosumer' (Charitsis, 2016: 37) (Sharon, 2017: 100-101). The latter role becomes synonymous with a set of practices which are a form of neoliberal labour in the 'knowledge economy', which the subject voluntarily carries out to contribute to their 'project of self-management' (Ford *et al.*, 2021: 52, 57; Tulloch and Randell-Moon, 2018: 204, 209). This is exacerbated by the gamification of these platforms, rendering them comparison-driven, as they are underpinned by the 'logic of pushing back limits and outdoing' (Bröckling, 2016: 13). Considering their onus on the individual, self-tracking applications have been hailed as the 'apotheosis of self-reflexivity' by promoting intense forms of individualism and healthism – accounting for individual morality rather than individual capacity with relation to health (Lupton, 2013: 398; Sharon, 2017: 101; Greco, 1993: 358). Problematically, taking this view presupposes that only knowledge which is numerical or datafies human experience is useful or valuable, neglecting the subjectivity and impartiality which is necessarily inherent to the act of measuring (boyd and Crawford, 2012: 667) and the utility of intuition and 'embodied' knowledge in the realm of healthcare and bodily autonomy (Sharon, 2017: 105).

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In the midst of this, PTAs and other self-tracking apps widely preach a 'promise of empowerment' to its users (Sharon, 2017: 97). Many find these platforms empowering as they allow them to gain a closer awareness of their bodies, communicate with a healthcare provider more knowledgeably, tilting the scales on a traditionally asymmetrical relationship, and many cost very little (Levy and Romo-Avilés, 2019; Sharon, 2017: 97; Novotny and Hutchinson, 2019: 334). In doing so, these apps democratize knowledge about a female body which is 'mysterious and difficult to know and understand', turning the user into someone which engages in 'participative medicine' (Swan, 2009: 513; Friedlander, 2023: 697). In short, the 'Quantified Self' undergoes a transformation to a 'Qualified Self' (Swan, 2013: 93).

On the flip side, however, through the rites and rituals of self-examination and self-inspection that users carry out and the empowerment that ensues, users become bound in a sort of Mephistophelian trade-off: being under a continuous stream of app-mediated surveillance for a sense of 'bodily ownership'. This contradictory 'bargain', its data-centric nature and its ties to surveillance capitalism will be explored in the following paragraph.

Manufacturing Reliance: Prosumers, PTAs and the Surveillant Paradigm

As previously iterated, PTAs are gamified to the extent that they represent a sphere in which users can compete with each other while using the app to fulfil their role of producers in a knowledge economy. This casts the user in the ambivalent role of prosumer, appointing them as 'the entrepreneur of himself or herself' as they tirelessly labour towards their project of self-improvement in the quest to increase their 'human capital' (Lupton, 1995: 12; Gordon, 1991: 44). Under the neoliberal model, these forms of 'unpaid labor' that people carry out for 'leisure' are a major source of income for the corporations that produce PTAs, as such, it is in their best interest to build an imperative around self-tracking (Charitsis, 2016: 42; Sharon, 2017: 99). Rendering data commodified to this extent, in line with an increasing consideration of data as a form of capital (Sadowski, 2019), also exacerbates the digital coercion techniques or 'nudges' which are introduced to encourage app usage (Mehrnezhad and Almeida, 2021: 2).

Manufacturing greater reliance on these types of platforms facilitates their integration into an everyday context of 'subjectivity and embodiment' (Lupton, 2013: 401). Furthermore, in accordance with the shift to individualism brought on by PTAs and other eHealth platforms,

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the user becomes uniquely *responsible* for themselves and their body as a ‘project’; hailing back to the healthist rhetoric of self-accountability and morality. What this does is it creates a tableau of the ‘ideal-type responsible citizens who possess the economic and motivational capacity to engage in self-surveillance technologies’ (Lupton, 2013: 397). For people with periods, it becomes a moral imperative (and even a compulsion) to take it upon themselves to download a period-tracking app to engage in apt self-governance as well as continuous ‘real-time performance optimization’ of their cycles and their associated symptoms (Swan, 2013: 85; Ford *et al.*, 2021: 49; Petersen and Lupton, 1996: 65). Self-tracking essentially becomes a way of disciplining and taming the self, becoming a ‘paradigmatic practice of contemporary surveillance society’ (Sharon, 2017: 98) whose intrusive interventions (which can be said to extend to healthcare’s ‘panoptic gaze’) are normalised and even made pleasurable through processes like gamification and nudging (Sharon, 2017: 98; French and Smith, 2013: 384) – effectively, the ‘surveillant paradigm’ has become the rule (Levy, 2015: 680). Thus, to make the body legible, PTA users enter an essentially Mephistophelian deal: whereby they willingly offer their behavioural data to apps with often ambiguous or opaque data extraction policies to access the predictive information about their bodies they need to competently manage them (Ford *et al.*, 2021: 51). In essence, the ‘conditions’ in which PTA users feel ‘empowerment’ are borne out of the dicta of surveillance capitalism whereby ‘illegible mechanisms of extraction, commodification and control’ estrange them from their own data – arguably rendering the empowerment these platforms create largely illusory (Ford *et al.*, 2021: 58; Zuboff, 2015: 75). Though data is not the same as profit, they ‘share a similar logic’: one borne out of accumulation. Because of this, many organisations (including those behind PTAs) have become driven by a ‘data imperative’ – i.e. the drive to extract ‘all data, from all sources, by any means possible’ (Fourcade and Healy, 2017: 9). As surveillance capitalism underpins this new logic of accumulation, it aims to maximise the amount of data it captures both to enlarge its market control and create new markets in response to changing consumer demand (Zuboff, 2015: 75, 76). The way PTAs do this is by expanding the domains in which they collect data. These platforms are now capable of capturing dozens of metrics which may be more or less linked to one’s cycle (e.g. ‘mood, skin, energy levels and much more’ (Clue, 2023a)), becoming increasingly akin to a personal diary where users may divulge intimate details about their lives without being fully in the know about the fate of their information. PTAs often sell users’

datafied entities (their ‘data doubles’ (Douglas-Jones, 2021: 159)) to large corporations like Facebook to make a profit (PI, 2019; CBS News, 2019), systematically commodifying the information which pertains to the health and embodiment of their user-base. Privacy International tested 36 PTAs in 2018 and found that 61% ‘automatically transfer data to Facebook the moment a user opens the app’ for its data analytics services (PI, 2019). Following a public outcry, Flo released an app update that would prevent this from happening and declared it would carry out a ‘privacy audit’ to review its data policy (Flo, 2019). The dangers of the systematic commodification of health data are perhaps none the more apparent in light of the overturning of *Roe v. Wade*. The massive extraction and sale of data from PTAs could potentially incriminate women who have received abortions as PTAs from their phone can be subpoenaed in court for evidence (Garamvolgyi, 2022). The points I have outlined in these paragraphs render it starkly apparent that PTAs are steeped in a context whose boundaries are defined by surveillance capitalism and neoliberalism, making it important to centre my inquiry into the ways these affect women’s self-perceptions of empowerment in relation to PTAs.

Conceptual Framework and Research Objectives

eHealth applications are businesses first and foremost. Thus, they are a product of the socioeconomic landscape they have been conceptualised and produced in: they both comprehend a ‘social’ system made up of human activity (e.g. knowledge, organizational practices etc.) and ‘technical’ systems, which are measurable and quantifiable, making them sociotechnical artefacts (Rose, 2016: 428; Levy, 2015: 688). Because of this, their intersection with the socioeconomic frameworks which drive the rationale behind the applications and production of PTAs must be taken into consideration when analysing their usage. Similarly, it is important to acknowledge the adoption of these platforms amid a neoliberal framework in the West (where this study is being carried out) specifically in the values this framework reinforces such as the concealment of power through its displacement to ‘seemingly neutral or impersonal systems’ like PTAs (Gill, 2019: 7-8). Thus, I draw upon feminist surveillance studies – i.e. the introduction of a critical ‘feminist praxis’ to the field (Dubrofsky and Magnet, 2015: 4) to better interrogate new concerns which pertain to ‘privilege, access, and risk’ in the usage of PTAs. This is especially relevant in light of the postfeminist sensibility which has

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become pervasive in Western culture and with it an emphasis on the body and the self as a self-managed entity where ‘choice, agency, autonomy and empowerment’ are seen as central to the project of selfhood (Gill, 2019: 10). A feminist framework will also be useful to expand on the unpaid labour done by users as prosumers for PTA companies, which re-vamps the idea of ‘double exploitation’ linked to feminist theory (i.e. the exploitation of women’s labour in the domestic *and* the professional sphere) as users often have to pay for services their unpaid labour helped develop (Charitsis, 2016: 43; Dunaway, 2001). Thus, taking this lens into consideration will be useful when observing how and whether PTAs contribute to upholding the values inherent to a neoliberalist subject, and whether those in my sample adhere to them. Furthermore, as surveillance is a cornerstone of postfeminist, neoliberalist culture, the body turning into a site of surveillance and self-inspection is encouraged for the sake of self-improvement (Gill, 2019: 23). Taking a gendered approach will be relevant to this topic of discussion to analyse how the ‘surveillant gaze’ (Abu-Laban, 2015: 51) does not scrutinise everyone equally and will be especially important in the context of healthcare, where individual and systemic vulnerabilities come to the fore against the power asymmetries inherent to our social fabric.

To this extent, the central question that I wish to tackle in my research is the following: in a social context saturated with large-scale data extraction practices and neoliberal labour values, how does a person’s use of PTAs shape their perception of bodily autonomy and empowerment? I wish to explore the intersections between these domains as, to my knowledge, this has yet to be tackled in depth in the literature. Ford *et al.* (2021) have made a first foray into analysing the influence of surveillance capitalism on PTAs. However, as the ‘politics’ of self-tracking ‘are not defiant toward the dominance of big data – they are instead in dialogue with it and reliant on it’ there is a significant difference between merely being ‘situated’ in and ‘adapting’ to specific discourses as opposed to ‘uncritically reproducing them’ (Nafus and Sherman, 2014: 1793). Though my research does not purport to hold all the answers to this, it will aim to initiate a conversation about how the latter applies to PTA usage. This study also aims to understand, on a limited scale, what types of people use PTAs and how critical their usage is. As such, I hope to explore users’ awareness of data privacy, commodification of health data and app usage especially in light of criticisms which has been leveraged against these apps for selling their data to third parties, which caused a wave of

controversy when first coming to light. Overall, I hope to understand how narratives around empowerment and bodily autonomy are shaped through the use of PTAs and how these are honed and influenced by the sociocultural milieu they are conceptualised and developed in.

RESEARCH DESIGN AND METHODOLOGY

The aim of this chapter will be to provide the methodological backbone for my research: this includes the rationale which has guided my process of data collection via semi-structured, long-form interviews and my subsequent findings through deductive thematic analysis. Here, I will provide the justification for my chosen approaches to sampling, data collection and analysis. At the end, these will be tied to my positionality as a researcher and the ethical ramifications of this.

Research Question

Following the previous theoretical chapter, a gap has been identified at the intersection of PTAs, the construction of the neoliberal subject and datafication. Given these considerations, this study aims to tackle the following central research question:

RQ: How does a person's use of a period-tracking app shape and inform their perception of bodily autonomy and empowerment amid a neoliberalist context promoting datafication?

This question has been intentionally framed to explore the wider ecology of PTAs and how self-tracking technology has fostered a change in people's relationships to their own selves and bodies. More specifically, my query will be explored by taking neoliberalism and surveillance capitalism into account as two powerful shaping forces in influencing the subject's perception of themselves.

Research Design and Methodological Rationale

As the primary aim of this study was to explore how interaction with PTAs impact users' self-beliefs and subjective experience, a qualitative approach was taken to probe into the ways in which participants' 'life experiences' served as the foundation for a theoretical 'body of knowledge' (Dicicco-Boom and Crabtree, 2006: 314).

My research consisted in 12 descriptive/interpretive semi-structured, long-form interviews with participants older than 18 but younger than 40, falling on a spectrum of professional and academic backgrounds, as well as possessing different cultural upbringings, genders and sexuality (McIntosh and Morse, 2015: 4). Interviews lasted 39 minutes on average. Per the parameters of a semi-structured interview, an interview guide with 40 questions was devised on and subdivided into a range of topics. This was done in an effort to let the interviewee steer the conversation in a direction they found relevant or interesting within the bounds of my research question rather than adhering to a strict question script (Adams, 2010: 366). In practice, I wanted the semi-structured format to act as a way to engage the participant in 'meaning making' as opposed to treating them as 'a conduit from which information is retrieved' (Dicicco-Boom and Crabtree, 2006: 314). As such, this approach was most befitting of this study's aims. Furthermore, I opted for a one-on-one format as this is useful to delve deeper into individual experience and how it ties into social context. By taking a constructionist stance whereby reality is intersubjective, i.e. the confluence of different experiences that cannot exist without human interaction (Berger and Luckmann, 1967: 37), interviews come to constitute a 'socially negotiated' space whereby knowledge formation can occur (Koro-Ljungberg, 2008: 430). Thus, the nature of these one-on-one sessions allowed the participant and myself to co-create meaning in a more intimate setting than would have been possible with a group interview (Holstein and Gubrium, 2003: 19). As the subject matter of this study is personal in nature (it concerns health and wellbeing), it can elicit responses individuals may not feel comfortable sharing in a group, further reinforcing the effectiveness of a one-on-one format (Adams, 2010: 367).

Throughout the data collection timeline, some questions were found not to elicit any responses or effectively engage the participants and, because of this, the interview guide changed dynamically throughout the interviewing process.

Sampling and Data Analysis

To select the sample of fifteen interviewees for this study, different sampling methods were used to maximise the number of recruits. As this research targets adult users of PTAs (with no restrictions on gender), a mixed approach combining convenience and purposive sampling was taken to select people who use or have recently used a PTA. A non-random approach to

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sampling was befitting of this study in that it has allowed for the saving of time and resources, as well as permitting the construction of an interview repertoire which was broad enough to carry out a thematic analysis (Etikan *et al.*, 2016: 1).

Several attempts were made to contact LGBTQ+ or women's groups and clubs outside the LSE campus to advertise this study. However, nothing fruitful came out of my correspondence with them. Ideally, participants would have been chosen at random from a sample of current or previous PTA users to minimise the 'biasing effect' of convenience sampling (Adams, 2010: 369). But as I did not get enough participation requests from individuals from these organisations, this turned out not to be possible for this study given the time restrictions. Additionally, due to the nature of the research I carried out, it could be important to acknowledge that there will nevertheless be a bias in those deciding to voluntarily partake in my study, as those who opt to do so are more likely to have informed opinions on women's and menstrual health or have some sort of interest or investment in the topic.

Furthermore, as the nature of this research could be construed as sensitive by some users and might necessitate a larger degree of trust in the interviewer, convenience sampling was largely used by leveraging my personal network on LinkedIn and Facebook as well as through societies on the LSE campus. Though these recruits were more directly accessible, no restraints were placed on the participants which opted to take part in the research and diverse views were encouraged to reach as much data saturation as possible. One method in which this was attempted, was to specifically reach out to LGBTQ+ organisations on and off campus to recruit transgender and non-binary users of these apps, as their perspectives were expected to vary from those of heterosexual and cisgender women in virtue of their embodying a different positionality. One participant was recruited through snowball sampling, which is posited to not have had a higher rate of success as a sampling technique due to the reluctance of subjects to share their participation in a study tackling their experience with a PTA or simple forgetfulness on the part of those being interviewed. In addition to the participant recruited from snowball sampling, 10 participants were recruited through the researcher's advertisement of the study on LinkedIn and Facebook and one participant was recruited through a course-related WhatsApp group chat.

Though convenience sampling is often not seen as the best way to sample participants, the purpose of this study is not to produce results which will be used to make demographically-representative inferences about all PTA users over 18 (Adams, 2010: 367; McIntosh and Morse, 2015: 8). Rather, it is to observe and analyse the trends which emerge from the ‘experiences, perspectives, or expertise’ in this particular sample of people (McIntosh and Morse, 2015: 8).

Following the interview process, I opted to carry out a deductive thematic analysis due to my desire to individuate ‘(larger) patterns of meaning’ from my corpus of interview data based on existing theories on user empowerment through PTAs (Clarke and Braun, 2015: 2) (see Appendix A). Importantly, thematic analysis provides a broad scope for flexibility, leaving room for understanding how patterns of meaning are generated across individuals with different perspectives – specifically ‘experiential’ meaning pertaining to feeling and embodiment (Clarke and Braun, 2015: 2). As such, my approach to thematic analysis falls into a more interpretivist camp as the ‘dialogical exchanges’ I have carried out with my subjects are used to ‘uncover (latent) meanings’ from their interview scripts (Finlay, 2021: 104). Though this method runs the risk of being affected by personal inferences influenced by my positionality as a researcher, I believe my awareness of this increased the conscientiousness I presented when engaging with my data; doing so in a way that is both thoughtful and conscious of my identity as well as how this impacted theme construction (Javadi and Zarea, 2016: 38; Braun and Clarke, 2019: 594).

Ethics and Reflexivity

Prior to interviews, individuals who expressed interest in the study were sent an information document detailing the aims of the study in further depth, as well as a consent form. The latter had to be signed and completed prior to the interview. All participants were anonymised through a code name and any identifying information was removed from the interview transcript. They were also informed at the start of every interview that they had a right not to answer any question they did not feel comfortable with and could opt out of participating in the study at a later date if they wished to do so. Furthermore, as some of the information divulged in interviews is health-related, every consent form and interview transcript was encrypted and password-protected to preserve confidentiality. It would be remiss, in a study which requires participants to divulge personal information and uses deductive thematic

analysis, to omit reflexivity. Through the interrogation of my 'social role and that of the interviewee' I attempted to acknowledge my positionality as a cisgender, white, heterosexual woman who is able-bodied and has received a privileged education (Dicicco-Boom and Crabtree, 2006: 43). However, it must also be acknowledged that my positionality fluctuated in my research process, in that I have never used a PTA, which cast the interviewee as the 'expert' during the interview, giving them a higher epistemic standing. Furthermore, during the interviews, I was open about my ignorance and expressed my eagerness to be taught by my subject (Buys *et al.*, 2022: 2032). This was especially the case when I interviewed queer participants about their experience on these apps: being keenly aware of the power differential engendered by our respective identities and the invasiveness of the interview process, I attempted to cast them as the experts in as far as possible and come at my questions from an angle they felt comfortable with, acknowledging the blind-spots in my knowledge (Dicicco-Boom and Crabtree, 2006: 317). Per Marcus (1994), my approach to reflexivity attempted to embody both 'the politics of location' – i.e. that my interpretation is but one in a 'complex matrix of alternative representations' (p. 571) and a feminist experiential reflexivity, which posits that positionality entails work which is not complete and requires the engagement of those in different positions (Marcus, 1994: 572). Finally, it is worth considering that multiple of my interviewees were acquaintances of mine and, as a consequence, I may have received privileged information from them they would not have divulged to a complete stranger. Though attempting to create an environment based on reciprocity in my interviews, by being a privileged position, I possess certain blind-spots (e.g. having a queer identity, a hormonal imbalance, being non-sex educated etc.) that will hinder me in fully understanding the experience of embodying those identities in their full depth and nuance.

RESULTS AND DISCUSSION

Becoming the Tracking Subject, Becoming the Tracked Subject

Every interviewee in my sample was either an active user of PTAs or had recently been. Four of my subjects used Clue, four used Flo, two used Clue and switched to the Oura Ring's Natural Cycles, one used Flo followed by 28 and finally, one interviewee used Apple Health (after switching from Clue). Users predominantly favoured apps which were used by their

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friends and/or family or appeared first on an app store search, though a lot of them could not recall what their first exposure to these platforms was. The decision to get a PTA for those in my sample seemed quite dispassionate for a lot of my subject, with most opting to do so pragmatically or out of a feeling they 'should' be tracking their period. However, this seemed to be enough to motivate them to download these apps, even when period-tracking was the only form of self-tracking they did, with one subject remarking that they didn't use 'other wellness apps or anything like that' or yet another claimed that if she had 'to be aware of any aspect of my body, this is probably the best one to keep track of?' with another not understanding this 'obsession with measuring things. But with this app, I think it just helps to take one burden off my mind'. Thus, period-tracking seemed to somehow differentiate itself from other forms of self-tracking. Often-times, this was tied to discussions on period 'normality' and 'regularity'. Across the board, it seemed important for users to know where they fit into a broader canon of 'normality', with my subjects overtly mentioning how 'much more in control' this made them feel. A lot of users gauged their period health in terms of its adherence to a 'normal', geometrically-recurrent 28-day cycle. As such, if a user did not possess a regular period or this presented 'abnormally', it posed a threat to their perceived bodily integrity. Per neoliberalism, an attack to one's bodily integrity is an attack to one's identity as the self is so tied up with the maintenance of one's health. Because of this, possessing an intimate knowledge of one's period becomes important to make the body legible and to understand the self and manage it more productively and efficiently.

Often, current and past users I interviewed were guided by 'shoulds': trackers felt that, for reasons they could or could not articulate, they felt compelled to track their periods. The general feeling in my sample can be best captured with what one interviewee said: 'I should probably keep track...I guess'. This sentiment was especially echoed by interviewees who got their period later than their peers ('It didn't become regular until I was about 18. And so, once it started I was like: 'I think there's a pattern', so I might as well track it') or went on birth control and experienced a change in their bodies ('given that fact that it's changed, maybe in the last five or so months, I should be tracking it'). Another user grew up in a social and educational context where discourse around periods was taboo, and felt that in order to combat that 'part of us' 'we're always taught to ignore (...) and play it off like it's cool, don't make a big deal out of it' they 'should get an app for it'. Here, the idea of personal

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responsibility as encouraged against a neoliberal backdrop comes into play: for the sake of the collective social good, individuals feel compelled to get an app to become an active prosumer of knowledge. It is not the responsibility of large state or government-run bodies to demystify women's health; instead, the fact this can and *should* be initiated through individual action was carried across throughout the discussions with my subjects.

In fact, tracking through PTAs seemed to be one of the primary ways in which this study's participants gained a greater sense of bodily awareness, with most of the interviewees claiming to be 'really bad at remembering the date of my period'. Some users would retroactively add data points to their apps to make up for their forgetting to do it for 'two or three days'. Interestingly, though my interviewees related to PTAs differently from an emotional and usefulness standpoint, a theme I observed in many of the interviews I carried out was a 'personification' of the PTA. By the latter, I mean that subjects would give these apps a 'voice' almost treating them as part of an inner dialogue or as an authority figure, developing a sort of parasocial relationship with it. One participant told me about how 'every time I try to open it [her PTA] it yells at me' and that it 'yells at you for being late or something'. Other interviewees would ascribe some dialogue to the app (e.g. 'Oh, you're pregnant' or 'Please open me!') and use word like 'says' or 'tells me' when referring to information the app gives them. One of my interviewees even referred to the app she used as 'this friend in my pocket' who 'does everything for me'. The app's interface was also described in terms of 'friendliness' by one of the users, who claimed that, in her view, Clue's was 'a lot more unfriendly than Apple's'. Regardless of my interviewees' differing emotional commitments or 'attachments' to tracking their periods with an app, a parasocial relationship with these platforms consistently emerged in my sample. I believe this may be due to the sensitive nature of the information which is divulged to these platforms and the auxiliary role they play in helping users take care of their bodies or become more closely acquainted with their selves: their primary aid and confidante in their project of becoming a citizen apt at the art of self-management. Likewise, it can be postulated that the pressure to track when a parasocial relationship with these platforms is instated becomes higher: in order not to let the app 'down', the user must keep tracking.

Accumulating Human Capital: Empowerment and Self-Knowledge

PTAs often market themselves according to the post-feminist, neoliberal pillars of 'choice, agency, autonomy and empowerment' (Gill, 2019: 9). As such, it became important to explore how their 'public perception contributed to shaping users' self-perceptions of empowerment and bodily autonomy; helping in the characterisation of 'the lived experiences and social reality of groups and individuals' (Jabareen, 2009: 51; Jones, 2017: 326).

From a practical standpoint, users generally felt that using a PTA made them feel 'really good' or 'secure' because they could be 'prepared'. The general empowering appeal of PTAs correlated with 'having one less thing to worry about'. One interviewee remarked how wanting 'to stop living in fear of constantly thinking, I'm going to bleed through my pants because I don't know when it's coming' compelled her to download a PTA. Using these platforms endowed multiple of my subjects with a sense of security: it helped them anticipate their period logistically without hampering the smooth running of other parts of their lives, most notably the working or social sphere – they could 'just live life' without tampering from an unexpected/heavy period. Many used PTAs to seamlessly navigate their busy schedule as young professionals. Users also mentioned how these apps were pre-emptively useful, in that it allowed them to prepare adequately for their period in order to move on with their to-dos with as little interference or friction from their body as possible. All my subjects were either engaged in full-time study or employment, so periods were often seen as a 'burden' and the 'labour' that came with them could be offloaded to a PTA, giving them space to be more productive working or socialising. Thus, users largely treated their body as an enterprise of sorts which had to be made as efficient, un-obstructive and frictionless with the world around them as possible, especially to focus on their careers (Houghton, 2019: 617). As such, being able to exert agency over their period before it caught them by surprise felt empowering to my subjects; a tableau in direct correspondence with the image of PTAs peddled by the corporations producing them.

For one user with PCOS, tracking her period held particular relevance as it felt important for her to 'know what's going on with my body. Because so many things can go wrong'. To her, tracking is a 'soothing' exercise in that it allows her to attain greater agency over her health and body in an arena where doctors may falter by not being able to 'help you' and she wishes

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'technology could serve us a lot better'. Tracking makes a 'huge difference', giving her a 'nice, not overwhelming, but a nice sense of control over my body'. This wasn't shared by another interviewee with (undiagnosed) PCOS, who felt like she 'had to take things into my own hands' because 'nobody's going to do it for me and the apps obviously aren't working' by feeding her 'information about where I was in my cycle which wasn't even necessarily true or accurate to my body'. Thus, for someone with a hormonal profile which did not conform to the 'norm' dictated by the medical establishment, health became a matter of personal responsibility even more starkly and the imperative to track could become somewhat more pressing as 'sickness punctures the image of the capable, autonomous, neoliberal subject' (Scharff, 2016: 223). The latter interviewee persistently pushed to gain a better grip on her bodily processes by reading books, consulting specialist hormonal health resources, trying different apps etc. These activities all seemed to be driven by the wish to prevent her 'abnormal' period from representing a personal failure of sorts and hampering her from moving with the same ease in the world as someone with a 'normal' period. Her cycle became a conundrum she had to 'crack' even though her doctors could not. Thus, as someone with a hormonal profile which deviates from that of the average person with a period, she felt that these apps were empowering in a different sense: useless in and of themselves whilst motivating her to take charge of her own health outside of them.

However, she acknowledges this type of self-knowledge has its pitfalls, commenting that: 'It's more the *comfort* of knowing it's there' and that this comfort may be a 'false illusion' which fails to address the bigger picture of a society whose 'built environment' still presupposes that everyone should conform to a social existence whose parameters are largely dictated by men. Broadly, the efforts the users in my sample went through to be prepared for their period and pre-empt it point to a discomfort at the potential unpredictability of their female anatomy and serve as a painful reminder of how it does not fit neatly within the rhythms dictated by patriarchal society at large. The extent to which these apps empowered users in my sample was relatively limited compared to the feeling of self-ownership advertised by PTA companies. As opposed to being life-altering technologies, these platforms mostly had an auxiliary function from a self-empowerment perspective in allowing users to go through their day to day life more efficiently: it allowed them to be working subjects more effectively, and

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few in my sample were unequivocally optimistic about the benefits these platforms endowed them with respects to their bodily autonomy and empowerment.

Self-knowledge was so crucial that most of the interviewees in my sample cited it as the primary reason they decided to join a PTA. One user 'really wanted to figure out what was happening with my irregularity' as she knew 'so little about hormones and mental health and stuff like that'. In fact, this is what 'attracted' her to the concept behind the app in the first place: 'this actually explains what's happening', though this eventually ended up not working out for her. Similarly, another interviewee who had been on hormonal birth control reported that 'nothing was ever consistent ever' during her cycle, which caused her to stop using the app for a period of time as 'it never guessed anything correctly anymore' because her 'period just was so impossible'. Thus, for users with irregular periods, the apps' loss of predictive function (due to an inability to neatly datafy their body's inner workings) meant an inability to cater to their need for sense-making and control over their reproductive health. Most other interviewees found that the app was helpful in gaining a better awareness of their bodies in one way or the other. When the user with the 'impossible' period came off birth control, she joined a PTA again and this made her 'more conscious of just my whole cycle'. Through the app's ability to predict her periods again, she gained a deeper understanding of how her cycle works in relation to the rest of her body, especially her insulin sensitivity (given that she has type I diabetes). Similarly, users who have found PTAs helpful have cited them as being 'incredibly instructive', 'made my body make more sense', 'increased self-awareness' and 'very much demystified it all'. With the latter subject also adding that, to her, 'the beauty of a period-tracking app is that it allows people to have a much greater knowledge about themselves'. This echoes the trust many users nurture towards PTAs in that they are marketed as platforms which are designed to pacify any anxieties which may arise at the prospect of an unmanageable or illegible body. In fact, the tracking imperative created by these apps is done through the promise of a complete corpus of knowledge and assured control over one's body, which is, as has been said in many instances throughout my interviews, an illusion at best and a delusion at worst. For the body to become known and managed like an enterprise, it must be broken down into parameters and components which can be surveilled or monitored. In short, it must become datafiable and datafied, as collecting the most data one possibly can is poised as the most sure-fire way of building a comprehensive body of knowledge on the

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physical self. The moment the body could not be known or broken down into data units (e.g. because of an irregular cycle), the illusion of empowerment created by these platforms was shattered – evidencing the close connection between knowledge and empowerment.

Conversely, one user with a regular cycle shared that she couldn't 'believe how much I've learned about my basic biology from an app'. Similarly, another subject expressed how important a curated platform containing articles by certified healthcare professionals (and not 'pseudo-experts') is to her. Even though one of the interviewees outright claimed that she has 'never really been that interested in exploring the science or effects that it [her period] has', she nevertheless thinks that she would have gotten a sort of 'educational thrill' had she been more consistent with inputting data on the app, pointing to a pervasive kind of 'faith' her and other users have in the platform's ability to uncover some aspects of their biology they might not know about or be privy to. Though this will be explored in further depth later in this section, paywalls were cited as a main obstacle to attaining educational information from PTAs ('by the time I was more curious about stuff like that it went behind a paywall'). The fact that these apps are considered 'luxury' felt 'weird' and 'concerning' to one user, who observed that whereas this knowledge was primarily community-taught to girls by women in their families, it has now shifted to educational institutions, where sex education may not be taught or taught poorly, and platforms like PTA, whose cost can be 'prohibitive' to those without the means to pay for the 'womanly wisdom' they provide. As the worth of the neoliberal subject is measured in relation to their human capital, the commodification of the information on these platforms (which also fulfil an educational role) is a threat to its accumulation; primarily acquired through learning and training (Houghton, 2019: 621). This also echoes the 'double exploitation' idea iterated in my 'Literature Review' chapter: the prosuming user pays to use a service whose development they have been central to (Chiaritsis, 2016: 43). It comes as no surprise that this instinctively feels frustrating or puzzling to these platforms' users.

Worryingly, through the accumulation of self-knowledge from these apps came a degree of instrumentalisation and detachment from the body. One of my interviewees remarked how it made them perceive their period as a 'mechanical process' and how it contributed to making them see their 'anatomy' as distinct from their 'mind' – separating their feelings and thoughts

from their body. Consequently, when they felt their mood worsen they had the ability to detach themselves from their emotions and ask themselves: 'I wonder what stage of my period I'm in?' in order to manage their impacts. Thus, the use of these apps seemed to exacerbate the perception of the body as a machine of sorts, whose patterns and functions can be 'optimised, calculated and improved' through 'the internalisation of specific patterns of behaviour', such as the surveillance of one's behaviour, moods or bodily states (Oksala, 2011: 106).

Data Privacy, Consumerism and Surveillance

'A woman must continually watch herself. She is almost continually accompanied by her own image of herself. (Berger, 1972: 46).

A common thread connecting the interviews was the idea of the body as a site of surveillance, which consistently came up through the quest for self-knowledge and empowerment users pursued through monitoring. The need for continuous optimisation means that every action 'becomes an investable advantage in a competitive world' (Houghton, 2019: 621). As such, the body must be made useful both from the perspective of being productive for labour (pre-empting the period) but also by acting as a reservoir producing a continuous stream of data from which the user can optimise themselves (tracking the period). Throughout my sample, users noticed that the app 'wants you to always input information (...) even if you're not on your period', evidencing the logic of accumulation underpinning the apps to generate revenue. Though some users inputted slightly more information than what was considered baseline (i.e. period duration and heaviness, sex drive etc.) most stuck to giving the app the most basic information they could, with one user feeling a sense of agency at the idea of *not* giving the app the information it requested ('I didn't give you [the app] information.'). In addition to this, some users expressed frustration at the sheer quantity of tracking options available on the app, saying that 'There were so many buttons' and that this was off-putting to them, both in terms of some of the information being too invasive but also being 'too much work' for too small a reward. The latter seemed to be an important point, as one user lamented the lack of 'user friendliness' of PTAs, claiming she would willingly enter more information into the app if it were less work to do so. Interestingly, the lack of efficiency presented by these platforms' interfaces appeared to be a primary deterrent for the users I interviewed. Consequently, a

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platform meant to aid with self-optimisation which was not optimised itself lost credibility, making my interviewees give up on using it to its full capacity. This was further reinforced by one of my subjects, who was very satisfied with the 'technical, smooth experiences' afforded to her by her PTA, professing this incentivised her to support the platform financially – highlighting the importance a frictionless user experience had for my interviewees.

The above is not to say that, despite their design flaws, users believed in these apps as bastions of feminism whose sole goal is to champion women's rights. On the contrary, a cynicism of sorts was pervasive with regards to the underlying motives of these for-profit platforms and the amount of information they asked of its users. Some subjects had a decidedly laissez-faire attitude when it came to feeding their app data, whilst others were very precious about their data footprint, saying outright they 'don't like giving it [the app] information'. The latter interviewee was particularly protective of her data and went as far as adjusting her cookie settings (which she is 'hyperaware' of) because she was getting ads on her app that were tailored to the phase of the cycle she was supposedly in. Being an American living in the United Kingdom, she liked the agency she had to alter her cookie settings and expressed her dislike at the way one has to 'work really hard to opt out' in the United States, being frustrated at why one needs to 'justify' why one needs privacy 'rather than justifying why privacy should be broken'. Another user expressed a similar feeling and called implicit consent 'dangerous' for the protection of individual privacy rights.

Though subjects generally had an opinionated take as to their preferences on data privacy, most were confused by privacy laws as well as the data extraction and sale practices of their PTAs – citing only a tenuous or outright non-existent understanding of them. One user read some data privacy highlights on the website of her PTA and mentioned being 'vaguely aware that they say they don't sell any of it [her data]'. However, in her 'heart of hearts', she doesn't 'really believe them'. Another user who initially referred to her app as something of a confidante, said that the company producing it 'pinkie swear' they will keep her data safe, 'but everyone pinkie swears it's not going anywhere. And it does (...) I know they say they don't sell to third parties. I hope that's true'. This is exacerbated by how 'tricky' GDPR and data privacy can be for a 'layperson' as well as the general feeling of diffidence towards these apps and their murky data trade practices. One user went as far as saying that one can never

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‘fully know if no one can harvest our data’ and that the way users navigate the app is predicated on ‘blind trust. Which is not good’. Here, users become acquainted with surveillance capitalism and its embeddedness in neoliberalism (Zuboff, 2019: 41-42; Cong, 2018: 1); they feel compelled to track to acquire human capital and optimise their self-as-enterprise whilst also harbouring an uneasy feeling that practices of ‘data extraction and analysis’ (Zuboff, 2015: 75) which may be beyond their conceptual grasp are at play. Thus, the body is a site of self-surveillance, enabled by an ill-defined entity which cannot, and perhaps, does not *want* to be fully known. In fact, the lack of control over one’s datafied existence coupled with the illusion of self-ownership are integral in generating a power imbalance favouring the ‘one-sided control over the means of production and processes of value creation’ surveillance capitalism (and the PTA companies which embrace it) need to thrive (Cong, 2018: 23).

Despite this, users rationalise and diminish these intrusive practices by saying their data is ‘just a number’ and that they realise that these companies do not care about their data specifically: ‘it’s not a personal thing’. Other subjects also remarked that they could not foresee how ‘information getting hacked’ or a ‘data breach’ of the platform could ‘hurt’ them. The most data-literate user I interviewed (she ‘deals with data all the time’ for her work) also held a mild position in the discussion, saying she is ‘not that precious about my data’ and doesn’t ‘care that much’, instead holding that the value of data does not lie in its individuality but rather in its aggregate form. Another user also wondered what the value of individual information would be and how this would differ if data analysis was done in-house or relegated to a third party.

The data collection discussion opened a conversation on women’s bodies becoming ‘a site of commerce’ (as one of my interviewees put it) in that PTAs and other self-tracking technologies are profiting from personal data and the insights which arise from it, in addition to the profit they reap from the monetisation of certain features on the app. This user found it ‘wrong’ and paradoxical for PTAs to market themselves as empowering platforms which help you ‘take back control of your body’ whilst having to pay to access features which encourage its commodification into something of an enterprise. Some used this as a reminder that ‘this is just another app (...) trying to make money’, rationalising it as being ‘the whole point’ of a

capitalist economy. Among some of my subjects there was quite a keen sense that ‘these kinds of things are monetised, because *everything* is monetised’ and that while this was outrageous to some, spending power was seen as yet another way for the subject to exert agency – not in the guise of the self but in the guise of the self as consumer:

we as the consumers have this enormous power of keeping things alive by paying a small amount (...) And that’s how we kind of encourage our values and support our values in the world: we do this by paying.

Thus, it is not only human capital which allows the neoliberal subject to affirm herself in the world and incentivises her to turn her body into a site of investment and surveillance, but also her capital. Her spending power becomes the best asset to assert her agency, in that it evidences her ability to influence the PTA market and its data-driven incentives.

CONCLUSION

This dissertation examined the effect of menstrual self-tracking to explore user self-perception of bodily autonomy and empowerment and endeavoured to intersect these with current trends in datafication and neoliberalism in the West. The decision behind the inquiry of this avenue stemmed from a gap in the literature’s analysis of period-tracking app user profiles and the socioeconomic context these apps operate in. By adopting ideas from Zuboff’s (2015) surveillance capitalism framework and its underpinning logic of accumulation, as well as the influence of neoliberalism in the construction of the individual, this study has sought to investigate how PTAs shape user self-perception of empowerment and bodily autonomy. Primarily, the aim of this dissertation has been to carry out a critical analysis of these platforms and their intersections with commodification, the body and self-perception as well as how these can endow further depth to discussions on self-tracking and eHealth.

My study pointed to an ambiguous relationship between users and PTAs which were both seen as a necessary evil but also a requirement to make the menstruating body more ‘legible’ and manageable. The primary imperative driving users in my sample to track their cycle was self-knowledge: I argued that this was due to the latter being the best way to accumulate human capital under a neoliberalist agenda. With PTAs, the human capital gained from self-

knowledge of the body can be re-invested to make the physical as well as the working 'self' more efficient. Thus, by becoming a more productive labouring subject, the latter may gain more monetary capital, turning the body into a long-term investment, like an enterprise. An 'entrepreneurial mind-set' seemed to be present in my sample as users grappled with a body which had to be managed when menstruating, with their cycle's unpredictability harbouring potentially unpalatable consequences for work or social life. In that dimension, PTAs were a powerful tool for the management of the self and empowering. To make the body into something which can be run effectively, it must be broken down into datafiable units. Consequently, due to the body being treated as a continuous stream and reservoir of data, it becomes a site of perpetual surveillance. The latter is made into an imperative under the data extraction practices necessitated by surveillance capitalism. Though my subjects may have been unaware of the theoretical imperatives driving this logic of accumulation, many were cynical about the incentives underpinning the organisations behind PTAs. However, this was not enough to deter them from using these platforms as they still felt the obligation to track and manage their selves. These findings hopefully act as a contribution and perhaps a first step into considering PTAs intersectionally: opening further discussions around the ways in which an increasing datafication of the self has on the self-perceptions of individuals. It would be interesting to investigate this phenomenon on a larger scale to see how individual self-perceptions of tracking individuals contribute to encourage self-monitoring behaviours on a societal level.

Crucially, it must be acknowledged that this investigation has several limitations which could be amended in future iterations or with further study. Firstly, due to time constraints, this study's sample was not very large. As such, to get a broader range of opinions, experiences and views (all of which are central to this type of inquiry) a bigger and more diverse sample could potentially contribute to make this study's findings richer. Furthermore, it must be stressed that as interview data is highly subjective and personal (the same can be said about deductive thematic analysis), my findings cannot be generalised to an entire population. Thus, making inferences about demographics of period-trackers based on the people interviewed from this study would be misguided. To do so, sample size would have to be a lot larger and a different method of data collection, like sample surveys, should be used. Furthermore, the conclusions derived by this study are inextricably tied to the feminist lens which has been

adopted throughout this inquiry, influencing my themes, the focus of my investigation, my interview questionnaire etc. Additionally, employing surveillance capitalism as a theoretical framework may also be up for discussion, with competing theories on datafication, like data colonialism (Couldry and Mejias, 2019) also providing compelling accounts for this phenomenon. It would be interesting to gauge how this study's argument would change in line with a different framework's premises on the effect of datafication on our social world. To conclude, the dictum 'I am what I track' did not ring true as a dogmatic truth among the individuals in my sample despite their buying into an individualised model of healthcare and a sense of moral responsibility over the functioning of their body. Though surveillance capitalism foists a tracking imperative on users which makes it harder for them to abstain from tracking, my subjects nevertheless felt an echo of these apps' promises of empowerment; if not through using them, then through actively taking the decision not to.

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APPENDIX: THEMATIC GRID

Deduced Themes	Sub-themes	Codes	Example Quotes
<u>Empowerment</u>	Predicting and pre-empting the period's arrival	Logistic preparation for one's cycle (e.g. packing pads or tampons)	(...) especially when you're going out with friends or you're traveling and things you want to know when you're about to have your period, just so you can be prepared. Because I think in my day to day, I kind of just live life and like don't think about when my period is going to come. (...) So I get alerts, I think I want to say like, "expect flow within the week", or like within five or three days. So I think it's quite helpful. You know, I'll grab my super tampons, pack them in my bag. Prepared.
		Being able to plan ahead for work and socialisation	(...) This will probably happen and so like I might not, I don't know, schedule to go out dancing this night. Because I know I'm probably going to be in a lot of pain. Yeah, that kind of stuff - or I probably won't go swimming

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		Having the privilege of being forgetful	(...) But, this app, like I don't, I don't think about it most days, I forget that I have it to be honest. Until I'm like, "Oh, maybe I'm going to be on my period soon". I'm like, oh, maybe my app that I have for this exact reason will tell me what I remember about it.
	Increased bodily awareness	Taking charge of their own menstrual health	(...) I got my period very late. For most of it. I got it when I was 15. And it didn't become regular till I was about 18. And so once it started, I was like, I think there's like a pattern. I was like, I might as well track it.
		Change in lifestyle habits	(...) but it's much more holistic in a sense, it tells you what like foods to eat on certain days and your cycle. And then like what kind of exercise to do on certain days of your cycle. Plus little quotes and things about how your energy levels might be. So I was like, "Oh, like this sounds cool. Sounds like that's for me".
		Parasocial relationship with the PTA	(...) I've got this friend in my pocket, and he does everything for me.
<u>Self-Knowledge</u>	Optimisation of health through the app	Continuous self-tracking to maintain an overview of the body	(...) and I found that incredibly instructive that having the data in front of me or like having the options in front of me made me think about those aspects of my body more. So I think so. Yeah, I think overall, yes, I mean, it was a- it's an app, right? But yes, it does, it does make a difference. (...) it sort of has made my body make more sense.
	Self-knowledge gained through PTA as power	Using PTA as an educational resource	I had a really not good sex education. So it was really nice. Getting pointed towards these research shows, like a first step for understanding more about it. Because I guess in school and stuff, you're just like, "Oh, this happens", but you don't really know why? (...) in and of itself knowledge is a kind of power for me.
		Understanding how hormonal imbalances/period irregularity impact life	(...) my mood is heavily affected by my cycle. It's really interesting, actually. So I experienced bad moods during my PMS stage, and some other symptoms. And I wanted to track it. I want to see because if I'm feeling sad, then knowing that oh, it's just Hormonal Health, because, then I'm like, obviously, I need to get through the emotions. But I don't need to be worried on what is wrong, you know what I mean?

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<u>Discipline and Control</u>	Reassurance of hormonal 'normality'	Finding tracking soothing/calming	(...) Well, I think I think I would like to say categorically that I think, you know, when they're functioning well, period, tracking apps are very good. And I think I think they've given me a lot of security.
		Compulsion to track	(...) I should probably start using a tracking app again, just to see... because my body's readjusting.
	Control over bodily functions	Reinforcing period predictability	(...) Okay, I should probably use a period tracking app again. Because suddenly I had like a normal period.
	Confirmation of hormonal 'abnormality'	Increase in monitoring of period	(...) if you can, like there's there will be women with PCOS that have a period every six months. And it's like, why have you know, a period tracking app but most of us are in that in between, where if you manage it, well, then you can do it, in which case, it's extremely valuable, right? Like it goes from being like pointless to being like, the most important thing.
Feeling of no control over body		(...) and I stopped using that [her period-tracking app] because my periods were just so irregular. I was like there's no point in using this as it says I'm going to get my period on this day and that like I'm in my menstrual phase or my luteal phase or my follicular phase. And I'm just going like: I don't even know what's happening in my body, I have no idea what's ever going on (...).	
<u>Datafication and Consumerism</u>	The body as a consumer good	Frustration towards paid features and unwillingness to pay	(...) and so it just seems a little bit wrong to market yourself as like, "we're here to help you take back control of your body" and then force someone to pay to do that. (...) I think that a lot of times, because so much of ourselves has become commodified And especially in the world of late stage capitalism, like the <i>physical</i> body, I think, has become a site of commerce much more than it used to be
		Spending power as a way to buy into better in-app optimisation	(..) we as the consumers have this enormous power of keeping things alive by paying a small amount and that's how we enable the world to function. Also, that's how we kind of encourage our values and support our values in the world. We do this by paying. And also, as I said, at the beginning, I think I might have been also a little bit suspicious about the free apps, not just because they were not as functional and user friendly, and a bit too, like basic, but also like, what's the incentive for those apps to make updates and you know, be bug free for example?

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		Acknowledgment of PTAs as businesses first and foremost	(...) I mean, it's a service. It is providing the benefit: someone has done, a lot of designers have done work. Scientists have given it like- I get the fact that it in the marketplace as a service. And I'm fine paying for- for that.
	Data and Privacy Concerns	Refraining from inputting 'too much' information	(...) but I didn't like it when they were like "Are you sexually active?" It was like, you don't need to know that. I don't know. Like, I was very much like, that's my information.
		Concerns about fate/safety of personal data on the app	In this like late-stage capitalism, post-internet boom world, we have to justify why we need it, rather than justifying why privacy should be broken. (...) I'm vaguely aware they don't sell any of it [her data]. But I guess in my heart of hearts I don't really believe them.
		Individual data v. Aggregate data	I'm not that precious about my data. But I just don't think it's that, like, valuable. The aggregate is the value.
	Data Collection	Overwhelming PTA user experience	(...) but there's way too many options. Like, I can open it right now. There's like, so much information you can put in. Yeah, like pain and emotions and energy, exercise. Mental health. It's just, I mean, just everyday (unintelligible), every day, ten categories is just too much work.