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Hormonal Health

Hormonal Health: Period Tracking Apps, Wellness,
and Self-Management in the Era of Surveillance Capitalism

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Abstract

Period tracking is an increasingly widespread practice, and its emphasis is changing from monitoring fertility to encompassing a more broad-based picture of users' health. Delving into the data of one's menstrual cycle, and the hormones that are presumed to be intimately linked with it, is a practice that is reshaping ideas about health and wellness, while also shaping subjects and subjectivities that succeed under conditions of surveillance capitalism. Through close examination of six extended interviews, this article elaborates a version of period tracking that sidesteps fertility and, in doing so, participates in the "queering" of menstrual technologies. Apps can facilitate the integration of institutional medical expertise and quotidian embodied experience within a broader approach to the self as a management project. We introduce the concept of "hormonal health" to describe a way of caring for, and knowing about, bodies, one that weaves together mental and physical health, correlates subjective and objective information, and calls into question the boundary between illness and wellness. For those we spoke with, menstrual cycles are understood to affect selfhood across any simplistic body-mind division or reproductive imperative, engendering complex techniques of self-management, including monitoring, hypothesizing, intervening in medical appointments, adjusting schedules, and interpreting social interactions. Such techniques empower their proponents, but not within conditions of their choosing. In addition to problems with data privacy and profit, these techniques perpetuate individualized solutions and the internalization of pressures in a gender-stratified, neoliberal context, facilitating success within flawed structures.

Introduction

> "I haven't been tracking, but I feel like I should."

This is how May,[1] an educated woman in her early 30s, explained her off-and-on use of period tracking apps. An estimated 50 million people worldwide use period tracking apps ([Rosato 2020](#)), with the BBC estimating as many as 200 million downloads of such apps in 2016 ([Dreaper 2016](#)). May's comment gestures towards a moral compulsion for self-surveillance that, for her, is entwined with this growing phenomenon. Such an imperative toward self-examination, self-optimization, and personal responsibility is part of what makes period tracking appealing to those who do not use it primarily for managing fertility. Delving into the data of one's menstrual cycle, and the hormones that are presumed to be intimately linked with it, is a practice that is reshaping ideas about health and wellness, while also shaping subjects and subjectivities that succeed under conditions of surveillance capitalism. Through close examination of six extended interviews, this article explores such developments in the context of educated, urban young adults in the United States.

Knowing one's body, and caring for one's health, are increasingly mediated through technological devices predicated on "data" ([Ruckenstein & Schüll 2017](#)), furthering the ongoing biomedicalization of health and medicine ([Clarke et al 2003](#)) and the long arc of bureaucratized scientific knowledge that heralds Artificial Intelligence as the final elimination of subjectivity ([Davis 2019](#)). An estimated 165,000 apps focused on health were already available in September 2015 ([Riaz 2015](#)), and among those, period tracking apps were reportedly the fourth most popular among adults and second most popular among adolescent women ([Moglia et al. 2016](#)). They are part of the "femtech" wave that is projected to have a market potential of $50 billion by 2025 ([Frost & Sullivan 2018](#)). Scholars are only beginning to understand such devices' potential impact on current and future healthcare provision, and likewise their impact on users' self-understanding and relationship with their embodied experience.

While many period tracking apps target people who are concerned with fertility, either trying to have a baby or prevent pregnancy,[2] they also appeal to many who want to monitor menstrual-cycle-related health problems, such as hormone-triggered migraines or unstable mood. As such apps become more commonly used and aligned with the suite of other health and fitness biometrics, they become a tool for people to monitor and optimize their bodies and embodied experience apart from specific health goals.[3] The amount and types of data that can be collected are ever-proliferating. While each app's interface differs somewhat, those that are commonly used in the US, such as Clue and Flo ([HelloClue 2021](#); [Flo Health 2021](#))

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[1] Pseudonyms used throughout.

[2] Some such apps, which rely on basal body temperature and are accompanied by thermometric devices, are marketed and FDA-approved as contraception (Food and Drug Administration, USA). They have come under a backlash against "inaccuracy"—c.f. [Sudjik 2018](#).

[3] Apple Health, which was launched in 2014 as one of the flagship biometric trackers on the market, only introduced period-tracking in late 2019. The public and media backlash over this was based in frustration at how menstruation has been relegated to fertility focused technology and how women's concerns have been sidelined by health tech more broadly ([Eveleth 2014](#)).

invite users to note not only dates of bleeding, temperature (which indicates ovulation), and sexual activity, which are the mainstays of fertility apps, but also things like cramping, energy levels, mood, heaviness and color of flow, libido, sleep, exercise, digestion, caffeine and alcohol consumption, and qualities of skin, hair, and vaginal discharge. The several pre-set options in each category are indicated by icons featuring catchy graphics, and there is often an option to make personalized notes as well.

Period tracking apps are both "more than medical," in terms of the range of information considered relevant, and "less than medical," in that they are often discussed in domains such as beauty/style. In late 2019, Flo, one of the most popular apps with 30 million active monthly users, and Clue, another popular app with over 12 million users, began suggesting diagnoses for conditions like PCOS (polycystic ovary syndrome) based on users' data patterns (Singer 2019). Flo intends to expand this diagnostic capacity to include heavy menstrual bleeding and endometriosis (Medgaget 2019). Clue advertises itself as a tool to "understand how your body works," (HelloClue 2021) and highlights its relationship with medical science by both integrating research into the user experience and app design, and feeding data back into the research process (Sheridan 2019). Yet as a practice, period tracking also intersects with trendy, exclusive, consumer-oriented products and services claiming to facilitate "wellness" and thereby making health into a commodifiable lifestyle. The benefits of period tracking can be articulated through contemporary class-based imperatives to deep personal examination and self-optimization (Ford 2020; Vallor 2016). This directly follows in the legacy of "healthism," first coined in 1980 to describe the striking moralization of health among middle-class Americans, and since elaborated to include the extensive and increasingly important social meanings attributed to "health" and its pursuit (Crawford 2006). It raises concerns about the extent to which health is a capacity of consumers and not of citizens—that is, a class-exclusive moral virtue instead of a collective responsibility.

In this article, in common with other work on health-related apps (e.g. Lupton 2014; Sharon 2016), we situate period tracking as a "technique of the self" (Foucault 1988) that both produces particular kinds of embodied experiences and reinforces contemporary political dynamics. Apps facilitate the integration of medical and non-medical approaches to health within a broader framework of approaching one's life as a personal management exercise. The kind of 'self-management project' that emerges from our interviewees' use of period tracking apps not only integrates institutional medical expertise with quotidian embodied experience, but integrates mental and physical health, and "subjective" and "objective" information. It calls into question the boundary between illness and wellness, and although it uses menstruation as its departure point, it far exceeds the typical scope of "reproductive medicine." Period tracking can be both a practice of self-care and a way of producing knowledge, which are bound up in trends toward the quantification and datafication of experience (Nafus 2016; Lynch & Farrington 2018; Besteman et al 2019). Della Bianca (2021) has theorized fertility app usage as "cyclic self-fashioning: a process through which the 'datafied body' becomes a catalyst for understanding and intervening on the self." Based on a set of interviews conducted in 2019, our analysis builds on such insights to not only situate period tracking as part of a neoliberal self-management project, but contextualize it within feminist approaches to menstruation, technology, and hormones. We introduce the concept of "hormonal health" to do so.

Hormonal health describes a way of caring for, and knowing about, bodies. Like the hormones to which menstrual cycles are biomedically attributed, period tracking straddles subjective and objective experience, medical and non-medical approaches to health, and personal and societal jurisdiction.

Hormones both literally constitute the cycles and effects that are being tracked; though the idea of the hormonal body has its own contingent history (Oudshoorn 2003), and are metaphorically emblematic of period tracking as a practice that defies conventional categorization. Scholars have recently described how hormones distort, disrupt and transcend boundaries of inside/outside, nature/culture and sex/gender in their role as actors in public and biomedical knowledges (Roberts 2007; Bärnreuther 2018; Erikainen 2020). Social science work has critically examined how hormones activate processes across emotions and physiology, social and material worlds, mental and physical health, organic and synthetic biology, the gendered and the non-gendered, and the normal and the pathological (Irni 2013; Sanabria 2016). Endocrine disrupting chemicals saturate our environments, complicating notions of individual agency over one's health and reproduction (Roberts 2017; Murphy 2013) and prompting "panics" over threatened sex-gender-kinship norms (Pollock 2016). Hormones blur gynecology, self-care regimes, and gendered well-being (Edmonds & Sanabria 2014). Thinking about apps via hormones provides a novel approach to considering health and wellness practices at the intersections of technology and self-care, data and self-knowledge, and individual consumers and public health, thereby contributing to timely debates in medical sociology, anthropology, and STS.

This approach also draws from, and adds to, an emerging literature of "Critical Menstrual Studies" (Bobel 2010; Fahs 2016; Bobel et al. 2020) which has built on the public upswell of interest and activism about menstruation. *Cosmopolitan* magazine dubbed 2015 "the year the period went public," and in the past half decade campaigns across the world have addressed period stigma, period poverty, and period-related inequalities in school achievement, sports, and medical care (Bobel 2019; Crawford et al. 2019). A swath of popular books have emerged advocating for the "menstrual movement" and instructing about menstrual and hormonal wellness (e.g. Okamoto 2018; Hill 2019; Morgan 2019). Together, these constitute a major shift in recognizing (and analyzing) the fundamental impact menstruation has on individuals and society. The increasing popularity of period tracking apps is undoubtedly related to this shift; our analysis elaborates how such menstrual activism intersects with "surveillance capitalism" for an elite segment of people.

Surveillance capitalism refers to "an emergent logic of accumulation" whereby data is extracted and commodified within a global architecture of computer mediation (Zuboff 2019). Zuboff describes surveillance capitalism as emerging out of a distributed and largely uncontested expression of power, constituted through unexpected and often illegible mechanisms of control that effectively exile persons from their own behavior, challenging not only democratic norms but those of traditional market capitalism. It requires that citizens willingly (if often ignorantly) offer up their behavioral data in exchange for access to information platforms. In the case of health tracking, this entails self-surveillance that circulates information outside the context of traditional medical institutions and authoritative expertise (Erikainen et al. 2019). This can invite modes of embodied attention/attunement that foster feminist empowerment (Ford 2019), yet there has been widespread concern over the ethics of data sharing and the collection and sale of "big data" with respect to apps in general (Boellstorff & Maurer 2015; Lupton 2016) and health apps in particular, which operate outside of the state's jurisdictions over healthcare despite collecting sensitive and personal information (Buijink et al. 2013; Martínez-Pérez et al. 2014). Surveillance capitalism raises concerns about privacy and the potentially discriminatory ends of surveillance, but moreover signals an alarm about the role of individual agency in contemporary political economy.

In what follows, we first discuss our methodology, the cultural specificity of our sample, and our analytical approach to gender and feminism. Next, we show how this particular version of app usage sidesteps fertility, such that menstrual cycles (and the hormones that drive them, by implication if not explicitly) are understood by users to affect selfhood across any simplistic body-mind division or reproductive imperative. In the following section, we elaborate how this approach to periods engenders complex techniques of self-management, including monitoring, hypothesizing, intervening in medical appointments, adjusting schedules, and interpreting social interactions. Finally, we analyze how such techniques sit within surveillance capitalism and feminist politics, empowering their proponents but within conditions not of their choosing. Ultimately, we argue that although attending to menstruation and hormonal cycles outside of their fertility function can serve to challenge misogynistic healthcare structures and expectations of bodily regularity while facilitating self-awareness, this happens within a context shaped by troubling dynamics of power and control. In addition to the vulnerabilities introduced by apps' questionable data security, the project of self-management exists to cultivate a neoliberal form of labor value that individualizes and internalizes external pressures, facilitating success within deeply flawed structures.

Methods and Methodology

This paper is based on a pilot project and six in-depth semi-structured interviews conducted in summer 2019. Participants were menstruating people between the ages of 19–35, living in the United States.[4] Some of the interviews were conducted online, others in public spaces in Chicago; the interviews lasted from 45 to 90 minutes, and were recorded, transcribed and anonymized; informed consent was obtained from all participants. Interviewees were drawn from the authors' own personal networks, were affiliated with elite higher education institutions, and lived in major urban areas; as such, they represent a cosmopolitan, upwardly-mobile class position. This is in line with studies indicating that users of health apps are often individuals who are younger, report good health, and have more education and higher income (Carroll et al. 2017), and that class plays a role in "health habitus" and the resulting self-confidence (Lewis 2006). The sample is both small and culturally particular, as the interviews express the perspectives of high-achieving people struggling with various kinds of anxiety as they negotiate success within demanding career trajectories. Notably, having children was not an active concern at this point in their lives. In recruiting friends and acquaintances, we facilitated the interviewees' comfort with research questions on private issues through a degree of trust at the outset, while at the same time these relationships inevitably influenced participants' answers. Our interviews and analysis are also inevitably shaped by our own experiences as menstruating people who have used period tracking apps and belong roughly to the same demographic. However, as befits a feminist methodology, we do not aspire to objectivity but situate ourselves relative to our collaborators (Haraway 1988).

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[4] Five identified as female, and one as non-binary. Their ethnicity varied, including four white Euro-Americans, one Middle-Eastern American, and one Asian-American.

In designing the question guide, we sought to investigate how people's practices of managing biometric data about their menstruation produce relationships to their bodies and hormonal cycles. We asked questions about app usage, interviewees' experience of menstrual cycles (including how they first learned to manage their periods); their gender identity and how their cycles impacted their experiences of gender; what they thought about hormones, whether they had concerns about data and privacy; and how they thought of health, healthcare, and the idea of "taking charge of your health." As always with semi-structured interviews, we followed the interviewees' answers into the areas that they seemed most interested in speaking about (Briggs 1986), thereby allowing them to stress what they think is relevant and highlight their own "voices" (Hymes 1996, 64).

None of the interviewees used the apps primarily for fertility or contraceptive reasons; rather, the common theme that emerged was using period tracking to comprehend and manage the variety of experiences interviewees associated with their periods, particularly mood. This approach often entailed mediating between mental and physical health, and using the collected data in both medical contexts and practices of self-care. Notably, all the interviewees mentioned their mental health in some capacity, and many referenced seeing therapists. It is difficult to disentangle this as an indicator of illness from a marker of class and some degree of connection with self-help culture and the neoliberal moral imperative to self-examination (Illouz 2008; Vallor 2016). Indeed, this aligns with our argument that period tracking provocatively spans oppositional categories, including "illness" and "wellness."

Our (dis)engagement with fertility, reproduction, and gender in this essay is delicate. We are not analytically discussing the "female body" to avoid reifying binary gender/sex, acknowledge that some trans and non-binary people have periods while many women do not, and unsettle the masculine non-menstruating body as the unmarked norm. Yet in the social context, control over women's reproductive capacities is an elephant in the room. We see something more complex happening than a women's choice framework, in that the entire question of childbearing is sidelined both in the interview material and consequently in our analysis. We find emancipatory potential in not eliding women's health with reproductive health, a common slippage that also reinforces men's exclusion from both reproductive health and hormonal influences (Almeling 2020). Yet period tracking apps are part of the proliferation of assistive reproductive technologies (Healy 2020) and burgeoning industrial investment in control over women's bodies and reproductive futurity in North America and Western Europe. This includes the egg freezing boom, which has become like investment banking in anticipating outcomes (van de Wiel 2020); and the positive ageing movement (Lamb 2014); both of these hinge on the desire for biological control via self-management. While it would be naïve to claim that fertility and heteronormative womanhood are irrelevant to our analysis, what we illuminate here is a niche where this is not the focus.

This approach stands in contrast to the apps themselves, which have been critiqued since their inception for making heteronormative assumptions about users and following the femtech mantra "pink it and shrink it," by which companies adapt men's products to female consumers by making them smaller and 'girlishly' colorful (Delano 2015; Epstein et al. 2017). The focus on fertility and contraception by app designers reinforces women as baby-producing and sexually active with men (Wilkinson et al. 2015; Lupton 2015; Healy 2020), and app calendars stretching into infinity call to mind a sort of algorithmic predictability that can be unnerving for those whose bodies are not "regular." In response, some apps have focused on customizability and more neutral aesthetics (see Ready 2021). By speaking to people for whom mood and

well-being were foregrounded instead of fertility, we contribute to the relatively sparse social science work on menstrual self-tracking while also pushing it in a new direction. Indeed, our interviews suggest that the "queering" of such technologies, which scholars have called for to push against normative stereotypes and assumptions about gendered sexual and reproductive subjects (Lupton 2015) is underway.

"A Period is More Than a Period": Transcending Categories

Using period tracking apps to make practical sense of their "lived bodies" (Lock & Farquhar 2007) was a common theme in the interviews. Our interviewees repeatedly mentioned wanting to use tracking to manage the interface between their menstrual cycle (which was treated as empirical evidence of a hormonal cycle) and their mood, energy, or mental health. This interface could include other symptoms like painful cramping and acne. Lisa, a 19-year-old student who identified as non-binary, explained that period tracking can help people "recognize certain signs about their bodies, and different stages that their bodies are in." Lisa said "the 15–18 options" of qualities to track has "made me realize that a period is more than a period. The totality of menstruation is not the period itself, it's the whole cycle with different elements to it, and by tracking my period I am also looking at how my body changes."

The people we spoke with sought patterns, predictability, explanation, and attunement—in short, they sought to "understand their bodies'" by merging mental and physical health and what are often considered "subjective" and "objective" embodied experiences. Sylvia, a graduate student in her late 20s, said her tracking app usage "really comes back to—what did my therapist call it, a 'rich emotional life.'" Her therapist suggested her emotions were tied to her cycle, and although Sylvia had never thought about that, she said it made sense to her. "I PMS real hard, and I think that everyone hates me. Keeping track of that . . . specifically, and getting those reminders that my hormones are doing things and I could be conflating things . . . It helps me separate the reality of the situation . . . from what I feel." Sylvia explained that when she feels bewildered by her emotional and social experience, "Tracking it helps give it an embodied reason to exist." If her feelings are embodied and cyclical, presumably attributable to manifestations of hormones, they become more comprehensible and less threatening. She said contextualizing her experience via her cycle helps "locate the intensity—instead of it being an intense situation that I am in, I am perceiving things intensely." This was an insight she arrived at with the help of her therapist. If "being in an intense situation" refers to a reality independent of her personal experience, then "feeling things intensely" shifts focus to her subjectivity and helps her know that it is "just" her feelings and not something she needs to interpret (and manage) as consequential for others. She uses the data from her period tracker not only with her therapist, but in a range of other medical appointments as well.

This approach mirrors hormones' own boundary-crossing capacities. Asking our interviewees what came to mind when they thought of hormones elicited strong reactions: hormones were a site for emotion, anxiety, projection, and overwhelm. Lisa's first reaction when asked was "Oh boy!" and laughter. Sylvia laughed and swore. May, from the opening quotation, jokingly replied, "Like my folk theory of hormones? What makes me crazy every month?" Another participant said, "hormones seem like a big shadowy puppet monster that if I could comprehend more easily I would understand other parts of my life." In their descriptions, our participants understood hormones as connected to emotional and biological processes in a generic sense, allowing bodies to "work properly." They described them using the terms "balance" and

"equilibrium," and metaphors such as signals to start or stop bodily processes, dials that get turned up and down, or "switches that send signals to your mood."

Throughout the interviews, our interlocutors repeatedly wondered "is it hormonal?" about various experiences or symptoms. We wonder what the implications of such explanations would be—if an experience is confirmed for someone as "hormonal," would that render it more or less important, upsetting, durable, inevitable, controllable? "Being hormonal" seems a key conceptual axis in terms of an experience being understood as part of one's body or self, and something one does or does not have the agency to "manage"—though how various experiences fit around this axis remains ambiguous. For example, Lisa's experience with anger and heightened emotions around their period was the inverse of Sylvia's; whereas they used to attribute it to "a period thing," they did this less after going into therapy and also dreaded their period a lot less.

For Nicole, a researcher in her mid-30s who made the "puppet monster" comment, the first specific hormone that came to mind was cortisol, and her musing about it is illustrative of how her hormonal self-management straddles objective and subjective experience:

> I think of cortisol a lot, because I'm generally a stressed person, and then I wonder, do I have higher cortisol levels? And what are the impacts on my health, and my weight, and my cognitive functions? . . . And then with my depression, there's always the question, is it hormonal, should I get my hormones tested? [. . .] I wish I had a better empirical understanding of my own hormones and how they relate to things in my life.

Hormonal health links an "empirical understanding" (i.e., based in the material body, in testable quantities) with "my life" (i.e., personal experience, in social contexts). We do not intend to reify these realms as separate, or suggest that hormones indicate some pre-social biological reality, but rather to draw attention to the ways that people bridge this supposed division in practice. In so doing they destabilize it, yet also reinforce it through using binary descriptive terms, those being the only terms readily available.

Nicole explained that she uses the app "mostly to get a better understanding of how my cycle impacts my mood, and my skin, my eating," following a statement that she has irregular periods and "is not a particularly in-tune person with my body." Yet she added a caveat about using and trusting these technologies: "I would rather be naturally in touch with my body, than needing an app to tell me, have I walked enough today, or if I'm hungry or not . . . I think people who are far in it are away from the purpose of being human, which is to be in touch with your body." Nicole's statement about her desire to understand herself resonates with both the legacy of women taking reproductive control via knowledge and technology (Murphy 2012), and the legacy of valorization attached to women's "natural" embodied attunement and intuition, interestingly reframing it in non-gendered terms about "being human."

Rosa, another researcher in her mid-30s, connected her decision to cut out exogenous, pharmaceutical influences on her hormones to her desire to be "in tune" with her body and its health:

> I stopped using oral contraception in 2008, mostly because I was done with it in the sense that I didn't want to have synthetic hormones in my system forever, I wanted my body to take its natural course... And this comes back to the relevance of the tracking app. I've been more aware of how my body cycles through its natural hormone process.

Rosa's desire to be in tune with her (natural) body extended beyond menstruation: "Over time, maybe every 6 months or year, I realize how my natural hormones affect other things, even my pain level or other conditions in my body, like the heart condition that I have." When asked if she tended to think about her cycle when she had a health complaint, or managing her health generally, she affirmed: "Yes, very much so . . . Every medical practitioner, specialists and GPs, I tend to, when describing my symptoms, never leave out how I perceive my cycle affecting these symptoms."

Anxiety about wanting to be 'in touch' with their body, but finding it challenging to manage this complex and technologically mediated experience, was reflected in our interlocutors' feelings about hormones as agents of embodied experience. Considering Nicole's reference to hormones as a shadowy "monster" more literally, we can see why hormones could be experienced as monstrous: invisible, difficult to read and understand, and potentially scary if they cause pain and distress. Monsters have disruptive power, and interviewees largely experienced hormones as disrupting their lives in ways that needed managing. Period tracking resonates strongly with practices like "mood charts" for psychiatric disorders, which likewise "encourage rational management of a subjective domain" ([Martin 2005, 328](#)), yet it plots mood alongside the purportedly natural, healthy, and physiologically-based process of menstruation. This attempts to ground moods in bodily materiality, and complicates designating some moods as pathological.

Insofar as hormones are seen as responsible for normalcy, adjudicating what counts as "hormonal" also grapples with what counts as "normal." The normal has long been analyzed as a site where medical ideas express sociopolitical conditions ([Canguilhem \[1966\] 1989](#)). Throughout his oeuvre, Foucault, who was influenced by Canguilhem, positions monstrosity as key to the structure of abnormality, "a kind of master category for understanding contemporary forms of exclusion, erasure, surveillance and control" ([Sharpe 2007](#)). Monster is etymologically derived from the Latin verb *moneo* ("to remind, warn, instruct, or foretell"), and indeed, apps that track hormonal fluctuations remind, warn, instruct and foretell in order to keep the socially monstrous in check.

"The App is One of Those Hacks:" Techniques of Management

For our collaborators, reconciling various aspects of their bodies, minds, emotions, and social interactions entailed experimenting with management techniques. Rosa explained that although she did not use many of her period-tracking app's functions, she liked "to have a visual of when my period is going to happen" so that she could "use it for PMS (premenstrual syndrome) management." She explained how she tries to "more or less ballpark predict when I should not be populating my schedule with too many things. I get really bad period cramps when I do, and I am out for half a day, maybe more, in pain . . . The app helps me anticipate." Rosa explained that not only is period tracking a form of self-care, but managing her life is as well, such that she knows what she needs at certain times of the month and makes that happen.

Rosa narrated that becoming "more of an adult" entailed slowly realizing the impact her period had always had on her, both in terms of physical pain and "mood as it relates to a hormonal state." She achieved such self-awareness through "having conversations and figuring things out in parallel with friends with similar issues, [and] comparing notes." "Figuring things out" refers both to self-understanding, and techniques for self-management. Rosa and her menstruating friends discussed "how we can manage it together, and the app is one of those hacks." Such retroactive interpretation suggests that coming to understand and effectively manage oneself can be a contemporary rite of passage. Echoing this retroactive

curiosity and our opening quotation about the moral compulsion to track, Sylvia stated: "It's weird to say that I've been neglecting [my cycle], but it feels like I should know more about it. There are times in my life where it would make sense to have known more."

In this context, self-knowledge very easily becomes recruited into modes of acting, and satisfactory, effective action becomes attributed to proper self-knowledge. This could manifest in social and professional scenarios, as in Rosa's decisions about her schedule or Sylvia's interpretations of her interactions with others. It also frequently emerged in managing clinical diagnoses and treatments. Everyone interviewed mentioned at least one present or prior mental health complaint, including: depression, anorexia, insomnia, PTSD (Post Traumatic Stress Disorder), ADHD (Attention Deficit Hyperactivity Disorder), ADD (Attention Deficit Disorder), and therapy for mood issues. In particular, Nicole wanted to understand whether her long history of depression was compounded by her period. She said she definitely thought about her cycle for other health complaints as well: "If I'm suddenly super tired, or my face is breaking out, or I want to eat everything… My first thought is to go to the app and see . . . Could this be explaining things? So occasionally I'll use it as a second line of evidence." When prompted about mood or mental health issues, she again said that she "definitely" turned to the app. Rosa self-identified as "extremely scatterbrained" and someone with ADD, and shared that the app is invaluable for keeping track of time.

PMS, the diagnostic most closely associated with menstrual cycles in which mood is affected by one's hormonal shifts, was referred to implicitly and explicitly. PMS and mood were used somewhat interchangeably, and managed within and outside medical spaces. 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, and added that when she sees her therapist "it's nice to track it and see the correlation between my physical state and physical health, and [how] that plays into mental health. I feel in a weird way like tracking through the app helps put that together."

The word choice of Lisa's "objective data," Nicole's "second line of evidence," and Sylvia's "reality of the situation" in the former section, is in line with our argument that tracking is a way of determining what's factual versus subjectively experiential. This approach seems at least partially strategic in addressing medical professionals who presumably treat quantified facts more seriously than anecdotes, which suggests some degree of disbelief and non-recognition of our interviewees' experiences (c.f. Hasson's 2012 study of how medical practice has had to moderate its need for an "objective" measure of menstrual pathology with increasing pressure to incorporate patient assessments of their own embodied experience). Tracking practices also mediate between mental and physical health, the separation of which within medical systems frustrated some interviewees. After describing how she was diagnosed and then un-diagnosed with PCOS (polycystic ovary syndrome, an excess-androgen condition), May felt discouraged about professional medicine's explanatory power. She elaborated that "My personal relationship to [hormones] lately is more of a question mark—what is this imbalance, and does this explain my pain, or other symptoms? I would say I'm curious about this equilibrium, and what it means to be out of balance."

The ubiquitous presence of synthetic hormonal drugs commonly marketed as contraception figured into most interviewees' management practices. Two were currently using hormonal birth control, and

everyone else had done or considered doing so. The difference between a period and pharmaceutical withdrawal bleed is important physiologically, yet not necessarily one that undermines period tracking as a management practice. Interviewees described their attempts to influence their hormones as a kind of roulette, tracking symptoms that might be due to endogenous or pharmaceutical hormones.

Nicole said she previously had a hormonal IUD (intrauterine device), "Which was great for a lot of reasons but gave me the worst acne of my life, and then they put me on lots of pills to deal with that and I just thought, why am I doing this? And also my psychiatrist has told me not to use hormonal birth control for possible mood impact." Lisa intentionally avoided synthetic hormones: "Because my acne was hormonal, because of the medications that I am taking, and because of my mental health diagnosis… Some of the side effects of synthetic hormones are depression and weight gain. I have body image distortion, I am really not looking forward to weight gain." Despite some reluctance, May used pharmaceutical hormones for debilitating pain from period cramps: "I've had issues with depression from hormonal birth control [so] in an ideal world I wouldn't take them—but as I age and my cramps are getting worse, and I don't want to take opioids every month . . . I'm not able to give up two days a month to be immobilized." Shuffling through various symptoms and disentangling which could be attributed to which hormones, while also exploring a complex matrix of how some hormones could compound or nullify others, were practices of hormonal self-management.

Empowered Within Conditions Not of Their Choosing: Surveillance Capitalism

Practicing hormonal health can be empowering—it gave our interlocutors a feeling of control over their bodies and experience via the effective management of hormonal states across their embodied, social, and emotional lives. Nonetheless, the conditions in which they experienced this empowerment were deeply shaped by the disempowering effects of both neoliberal labor markets and surveillance capitalism. Sylvia presents an interesting example of this paradox. She thought that the ultimate goal of tracking was not an algorithmic optimization of performance, and instead sought to maximize her feelings of ease. Yet embracing something like feelings of ease is precisely how individuals become willing subjects in the furtherance of neoliberal techniques of self-management (Bröckling 2016). When asked if she had heard of targeted programs of what to eat or do during different times in her cycle, she said:

> I think that's where I personally have drawn the line of more trouble than it's worth. I think I use [tracking my period] more as an excuse, like 'I don't feel good, maybe it's this.' I think I PMS much worse than I had previously realized, and was projecting a lot of emotions and pains onto random things in my life rather than thinking, like, oh this happens every month I wonder why? I just always felt like I couldn't get a break. So it's a lot easier to blame [my social-emotional struggles] on [my period] than restructuring my life.

Sylvia's detailed effort at self-management was, ultimately, a way of making herself feel good in a complex context where she felt responsible for making the necessary bridges between objectivity and subjectivity, illness and wellness, the medical and non-medical, and the individual and social. She summed up her interest in period tracking as "just being nicer to myself." Nevertheless, what "nice" looks like is shaped by the pressure Sylvia felt to be productive, disciplined, and predictable in her graduate school activities, and her desire to cultivate regularity and rational comprehension. Therefore, while she had come to terms with

the fact that her experience was not uniform, predictable, or always at its best, this relief accompanied a split between her body and self, such that her body (and its hormones) could carry some blame for difficult experiences, rather than allowing such experiences to threaten her sense of worth. Restructuring one's life would require confronting the structures that condition what a meaningful life seems to be, and indeed, that is not an easy task.

Period tracking apps resonate with the *Our Bodies, Ourselves* movement in putting health technologies for self-knowledge and self-care in the hands of menstruating people. However, then and now, feminist health devices, practices, and information are appropriated into global biopolitical regimes and international health markets. The concept of "reproductive health" launched by this earlier movement tied women's health care into patterns of systemic racism and classism (Murphy 2012). The face-to-face sociality that shaped that movement has largely been replaced by tacit, often non-consensual connections via data on digital platforms. The majority of tracking apps send and sell personal health data to companies that profit from it, an issue that has been getting recent media attention (PI 2019). Brazilian coding rights group Chupadados (literally meaning "Data Sucker") recently released a report (Felizi & Varon 2020) contextualizing this scandal in the broader phenomenon of unpaid and undervalued reproductive work. Critiques about responsibility, privacy, and monetization are all relevant in this timely discussion (c.f. Lupton 2014; Sharon 2016).

Even though all of our interlocutors expressed some level of concern about privacy, the compulsion to track, or its appeal, was strong enough that this did not deter usage, which is in line with the illegible, distributed, and uncontested nature of control within surveillance capitalism. May described it as a "no-exit situation" wherein she just tries "to limit the damage." Nicole referenced the headlines she had seen about data mining and targeting marketing, saying "I assume the data goes where all data goes: through the funnel of the data-marketing economy into the pockets of rich people," but when asked how she felt about that, she noted that it clearly doesn't stop her from using her app. "It's a shitty bait-and-switch—here's something that can help you understand yourself better, but people are literally profiting off that." Our collaborators viewed the situation as an adequate (if frustrating) tradeoff for empowering themselves, and indeed, assessing and mitigating data risks was part of their portfolio of management techniques. Sylvia said she presumes her data must be being sold, but that if she were "getting ads when I start my cycle that are like, need a hot pad? That would be too much" and she would stop tracking. Rosa refrained from inputting information she considered especially sensitive, such as sex drive (though she noted she had the luxury of not needing to "solve a problem" about this particularly), and qualified being "not paranoid" with her ability to leave the country if she faced discrimination from healthcare industries. Alongside all this, both expressed interest in the scientific potential of all the aggregate data.

Making uncomfortable compromises in a context of privatized healthcare and a largely-unregulated market raises concerns about the deepening extent to which health is a capacity of consumers and not of citizens. While managing one's hormonal health need not necessarily further this process, the contemporary conditions around period tracking in the United States (and globally) make these broader issues impossible to ignore. More intimately, self-management via period tracking risks burdening people with ever-proliferating opportunities for optimization that apply new forms of pressure, a critique commonly levied against neoliberal discourses that place responsibility and "resilience" on individuals' shoulders. Nicole explicitly discussed that "putting the onus on the individual" was a problem with the

quantified-self movement, also calling it "joyless" and "an affront to the vast complexity and mystery that it is to be human"—yet she immediately followed this by saying she uses biometric trackers because they are helpful. With sleep trackers and chronic insomnia, she feels "like I got two hours of sleep but I [know I] actually got five." Critiquing contemporary conditions is one thing; negotiating life under them is another. Rosa explained that she never made a conscious decision *not* to use biometric trackers, but was "just so overwhelmed by all the information. Like, why do I need to know how many steps I take?" Tongue-in-cheek, she wondered if she was not that good at taking care of herself because she *should* know this information, saying "But I haven't quite gotten there yet. It's already hard enough to plan my life around my hormone levels!"

Other scholars have elaborated the patriarchal implications of app design and the advertisements that stem from data sharing, which reinforce normative ideas around childbearing (Healy 2020). While we do not disagree, from our perspective questions about data ethics, profit, and privacy only partially describe the problems with period tracking. For a certain young elite, hormonal self-management can promote entrepreneurial self-cultivation in very intimate areas of life. This builds on Emily Martin's ([1987] 1992) classic analysis of PMS and work discipline, which shows how women are excluded from the labor force on the basis of their hormonal cycles only when it is convenient within current capitalist conditions, and that their unruly anger is plausibly (and justifiably) due to boring and oppressive labor conditions, whether in reproductive or productive spheres.

Tools to manage this often overwhelming and confusing interface between labor and selfhood can certainly feel empowering to their users in the absence of institutional or community solutions. Somewhat ironically, apps highlight cyclicity in order to help menstruators fit into a society that expects regularity. When asked how gender affects her tracking experience, Nicole explained that she is slightly annoyed at having to manage what she self-consciously called "extra burdens," saying "when I'm PMS-ing really hard and I'm really tired, I just think about how many cis men don't have to deal with this. But also it's kind of empowering—like anything you can do I can do bleeding." She called such management "identifying roadblocks," that is, roadblocks to success in a world designed for male bodies.

Our collaborators' app usage echoes questions other scholars have asked about what a "feminist technology" is or could be (e.g. Layne, Vostral, and Boyer 2010; Vostral 2010), and the novel and extraordinary powerful regulatory gaze directed at women in digital and media cultures makes it clear that surveillance is a feminist issue (Gill 2019). Period tracking apps also grapple with issues at the very center of feminism (Bobel 2010). Situating menstrual experiences as fundamental to not only reproductive health, but areas of life generally treated as separate from periods, such as professional success, social interactions, and mental health (which we have theorized as "hormonal health"), could further a certain version of feminist empowerment, bringing issues relegated to "reproduction" or "women" or labeled "shameful" into the center. On the other hand, this risks becoming an iteration of menstrual determinism, drawing on legacies of hysteria to foreground female reproductive capacities in a discriminatory or prescriptive way. The situation is a microcosm of feminist debate over whether to transcend and minimize female differences on the one hand, versus celebrate and make them central on the other. Tracking apps can do both, focusing on cycles in order to manage them away. Cloaked as empowerment, it *is* empowerment insofar as it produces options and feelings of ease—but within a burdensome context which it does not fundamentally challenge.

Conclusion

In this article, we have discussed hormonal self-management via period tracking apps as a way some people achieve a feeling of control over their experience. Far from merely producing knowledge about fertility or recruiting users into a heteronormative "contraceptive imperative" ([Wilkinson et al. 2015](#)), period tracking apps allow some users to feel empowered in a neoliberal context that is frustrating and dissatisfying, whether around mainstream healthcare and professional medical science or labor pressures to self-optimize and be resilient. Our collaborators for this pilot study are managing their bodies and selves across conventional distinctions between mental and physical health, normal and pathological states, expert and non-expert knowledges, and science and self-help practices. In doing so, they are actively challenging the underpinnings of contemporary reproductive healthcare, even while they advance the entanglement of health with data and tech companies' profits in the new norm of surveillance capitalism.

Hormones were conceptualized and considered by our participants as mediators and disruptors, frustrating "monsters" that held keys to understanding; yet, also, personal objects of curiosity and intimacy. Period tracking can blur boundaries between cultivating health and treating illness, encompassing ever-proliferating aspects of life that may not seem related but are posited as relevant through hormonal self-management. In wondering—"is it hormonal?"—users are experimenting with the categories that are constitutive of contemporary societies, such as normalcy, expertise, and gender, although their experiments may reinforce such categories as much as challenge them. If contextualizing experience within one's hormonal cycle eases some of the challenges of contemporary life, it will continue to appeal, and to reshape the terms of health and wellness into the future.

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