

Measuring Menses: Design Based Investigations of Menstrual Tracking Applications

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Introduction

In this chapter, we¹ describe our efforts to examine and reimagine menstrual tracking technology—or, mobile applications (apps) designed to support the documentation and quantification of menstrual cycle data. In their current formation, these technologies encourage those who menstruate to extract intimate information about the body. Users of these applications are commonly asked to record menstrual cycle start and end dates, consistency or color of menstrual flow, physical and emotional symptoms, and details of sexual behavior. In return, these apps regularly promise to predict the beginning and duration of one's next cycle, "fertile days," and offer insight into managing one's period (e.g. tips on forms of self-care and material preparedness through the carry of pads and so on).

Technology design as a broad industry has often ignored practices and issues associated with women's health, including menstruation. For instance, Apple Health launched in 2014 with the promise of monitoring "all of your metrics that you're most interested in," yet did not include the ability to track menstruation until a year later after online backlash (Perez 2015). This attention has shifted though, as startups have formed to fill in this gap with the number of menstrual applications growing rapidly over the last decade and an estimated 200 million downloads worldwide by 2016 (Dreaper 2016). More recently, standalone mobile applications for menstrual tracking and integrated hardware meant to connect the collection of sensor-based data with predictive models (e.g. a connected thermometer encouraging daily collection of basal body measurements and automatic storage of such data (Magee 2015)) have been developed by companies such as Clue, Kindara and Glow. The startups tout precise data analytics to inform knowledge of users' cycles (Magee 2015; Lomas 2015), as they garner millions of dollars in venture capital. Yet, there remain open questions about the data that is being collected and

¹ In this chapter, Fox and Epstein discuss a set of studies done in collaboration with fellow researchers at University of Washington and Northwestern University. The first case describes a collaboration between Daniel Epstein, Nicole Lee, Jennifer Kang, Elena Agapie, Jessica Schroeder, Laura Pina, James Fogarty, Julie Kientz, Sean Munson. The second case drew on a collaboration between Sarah Fox and Amanda Menking, Jordan Eschler, and Uba Backonja. More details about each individual study can be found in the articles referenced below.

Daniel A. Epstein, Nicole B. Lee, Jennifer H. Kang, Elena Agapie, Jessica Schroeder, Laura R. Pina, James Fogarty, Julie A. Kientz, and Sean Munson. 2017. Examining Menstrual Tracking to Inform the Design of Personal Informatics Tools. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17). ACM, New York, NY, USA, 6876-6888.

Jordan Eschler, Amanda Menking, Sarah E. Fox, and Uba Backonja. 2018. "Menstrual Tracking Apps." Manuscript submitted for publication.

Sarah E. Fox, Amanda Menking, Jordan Eschler, and Uba Backonja. 2018. "Period Packet: Reimagining the Period App Protocol." Manuscript submitted for publication.

how it constructs a narrow and sometimes instrumentalized view of menstrual experiences—questions we puzzle over the course of this chapter.

In examining menstrual tracking technology, we take up a designerly lens (Zimmerman, Forlizzi, and Evenson 2007), opening up the ways in which apps inscribe particular visions of what the body is capable of and how one is enrolled to make sense of menstruation. In doing so, we identify openings to explore how these technologies could exist differently, to encourage self-knowledge and affirm and support the needs of different kinds of menstruating bodies (i.e. beyond a fertility or contraceptive focus that occupies many apps on the market). Toward the aim of examining and reimagining, we identify expanded forms of *measuring menses*, ones that might emphasize modules—over the models that come with algorithmic ways of knowing—and dimensionality, rather than a user’s relation to averages or norms.

In what follows we describe two case studies: one examining the design of existing applications and how they are interpreted by users, and the other using participatory approaches that draw on the experiences of menstruators to introduce alternatives to dominant menstrual app protocols. With the first, we uncover core issues of usability and inclusion in existing processes of menstrual tracking—for instance, apps assume individuals have a regular cycle, are interested in tracking for fertility, identify as female, and have one male partner. Here, the focus is on how current apps support people’s needs, and what designers of personal tracking tools might learn from people who record and make use of their menstrual cycle data. The other study examines tracking as an under-interrogated form of recordkeeping about the body and traces how it has evolved to serve people differently. It further takes up participatory techniques of design to invite members of the menstruating public to reimagine these technologies to better serve their own goals of menstrual sensemaking.

Background

Before describing these cases in detail, we first turn to a backdrop of design activity within and just outside the space of menstrual tracking that both animates and motivates our discussion.

The Personal (Informatics) is Political

“Health is a big information problem waiting for data analytics and wearable sensors. I wanted to start somewhere to make a difference [...] I found it in procreation”

- Max Levchin (Cofounder, Glow; former Chief Technology Officer, Paypal)

Within the realm of technology design, the past decade has seen a turn toward big data. Though not a wholly new phenomenon, innovation in terms of cloud storage and machine learning has introduced an era where “value comes from the patterns that can be derived by making connections between pieces of data, about an individual, about individuals in relation to others, about groups of people, or simply about the structure of information itself” (boyd and Crawford 2012). Practitioners and “tech evangelist” alike preach the almost limitless potential of data to tell us things about the world—with enough of it, we can cast away uncertainty and focus the fuzziness associated with forms of risk. From forecasts on market performance to understanding food inequity (De Choudhury, Sharma, and Kiciman 2016), data is seen as the answer to some of the world’s most elusive concerns.

There is hardly a more apt embodiment of this technology utopian view than the above statement from Max Levchin, Co-Founder of the menstrual tracking app Glow (Goode 2013). Prior to Glow, Levchin’s

interests largely focused on building finance companies. A startup that enables people to send money to others (Paypal) and another to predict risk associated with lending (Affirm) are among those in his portfolio. In his view, as explained during Glow's debut at the technology conference D: All Things Digital, concerns for menstrual tracking and financial transaction are not so distinct—predictive models guide both this modern form of fertility awareness and market decision making (Goode 2013). In a world where infertility is largely left uncovered by health insurance, Levchin insists, menstrual tracking fills a gap, offering a form of technologically-aided assurance in place of medical attention. If one carefully collects data such as cervical mucus texture and menstrual cycle dates and follows the guidance of the predictive model, the need for traditional forms of medical or health advice (through say a doctor or doula) are no longer necessary to achieve pregnancy—all one needs is a smartphone, an internet connection, \$47.99 (for a premium account), and a willingness to track.

In applying a design-oriented lens to menstrual tracking, we sought to both understand and challenge the ways in which these contemporary technological infrastructures are not formed *de novo* (Star 1999; Ribes and Jackson 2013), but are instead inscribed with particular histories. Many of the measurements and predictive models upon which popular menstrual apps rely, for instance, draw from fertility awareness-based methods, or recording techniques designed to encourage "natural family planning." Promoted by Catholic physicians, endorsed by the Pope, and taken up by parishioners over most of the last century, these birth control methods aimed at allowing Catholic couples to have more control over the size of their families (Ashley 2006). Here, then, these technologies not only inherit modes of counting, but also moral orientations.

Beyond 'Fertile Windows'

This message of big data assurance, alongside a contemporary political climate particularly unfriendly to forms of reproductive healthcare and education, has placed new weight and sense of importance on data-rich menstrual tracking technologies. A leaked White House memo, for instance, described a US Department of Health and Human Services proposal to remove all forms of family planning programming for teens aside from the promotion of fertility awareness-based methods (Beutler 2017). In Europe, Natural Cycles was the first menstrual tracking application to be certified by the European Union as a method of contraception, a move that has garnered renewed attention and scrutiny as a Swedish clinic recently raised flags after 37 of their patients had unwanted pregnancies despite using the app (Pardes 2018; England 2017). These cases begin to expose the limits to a singular vision of the role of technology in menstrual tracking—as a standalone contraceptive or fertility device—and the ways in which these apps are of both political and personal consequence ripe for critical, empirical investigation.

Within the field of Human Computer Interaction, researchers have argued for a critical practice for the here and now of technology design. Civic media scholar Catherine D'Ignazio and colleagues take up the format of the large-scale hackathon in order to focus engineering attention to the task of redesigning the breast pump, a technology the researchers identify as long overlooked by industry (D'Ignazio et al. 2016). Similarly, Almeida et al. (2016) use familiar smartphone technology to promote pelvic floor fitness and everyday engagement with reproductive health concepts. Together these projects have helped scaffold a growing literature concerned with feminist framings of technology cultures, offering direct ways for researchers and practitioners alike to critically and productively explore alternatives to current design situations. In the cases described below, we take up methods common in processes of technology development and evaluation (e.g. surveys, heuristic evaluation, interviews, app review analysis, participatory design, etc.) to investigate and conceptualize alternatives that currently reinforce

particular visions of the menstruating body as realizing a reproductive capacity or as associated with a particular brand of femininity.

CASE ONE: Examining Existing Menstrual Tracking Technologies

In the first case study, I (Epstein) conducted research with Human Computer Interaction researchers Lee, Kang, Agapie, Schroeder, Pina, Fogarty, Kientz, and Munson to understand how contemporary mobile apps support or neglect those tracking their menstrual cycles—accounts we, in turn, used to inform recommendations for improving the designs (Epstein et al. 2017). The approach in this work was to characterize people’s in-situ experiences and challenges tracking their menstrual cycles as a means to critique design choices in contemporary apps. To do this work, we drew from three key streams of data: 2,000 app store reviews of the 12 most reviewed Android and iPhone apps, a survey of 687 people who menstruate (recruited via Facebook, Twitter, and Reddit), and 12 interviews with individuals from socioeconomic, race, and identity groups underrepresented in our survey sample. Elsewhere, we discuss in more detail our study’s methods, as well as offer longer form descriptions of our findings (Epstein et al. 2017). In what follows, we summarize why people use mobile apps to track their menstrual cycles and the challenges people face when using commercial apps.

Motivations for measuring

Many of the participants in our study reported turning to digital methods for tracking their menstrual cycle as part of a broader evolution of digitizing personal data (e.g., schedule planning and financial management moving from paper to digital systems). Some respondents described searching for an app immediately after obtaining a smartphone, or beginning to use a digital calendar as the rest of their schedule planning moved digital. Participants who continued to use paper-based systems such as diaries and journals preferred the flexibility and privacy they associated with paper. Other participants tracked more implicitly by following pill-based hormonal birth control, noticing early symptoms of the arrival of their period, or simply remembering when their period last occurred and counting forward in their head.

Pitfalls of prediction

To enable preparation, most apps include the ability to send push notifications a day before someone’s period is expected to arrive or they are next expected to ovulate. Participants found this feature the most compelling reason for a digital app. They evaluated apps foremost on its ability to predict where they were in their cycle, such as whether they are about to have their period or are about to ovulate—18% of app reviews mentioned the accuracy or inaccuracy of prediction. This prediction is sometimes presented as a single-day estimate, as with the app Life (Figure 1a). Other apps, such as Clue, provide a range of possible affected days and describe a sense of uncertainty in their prediction (Figure 1b) represented by the bubbles at the tail ends of the fertile window and confidence intervals (e.g., +/-1) in the text description. Participants described switching apps in search of more accurate alternatives, similar how people abandon the use apps and devices to track other aspects of their wellbeing (Epstein et al. 2015).



Figure 1. Phone apps predict when someone is next expected to have their period or ovulate. The Life app (left) presents this prediction through single-day estimates, while the Clue app (b) provides a range of potential dates for the event.

To scaffold prediction, apps often ask people to enter their average cycle length and flow duration upon installation, updating these predictions once the user has experienced their cycle and logged it in the app (Figure 2). Unfortunately, these predictions encode assumptions about the regularity and frequency of a person's cycle. Apps assume minimal cycle variation, when in reality a person's cycle can vary by days or even weeks (Fraser et al. 2007). Moreover, apps fail to account for variations caused by life factors such as stress, sleep, and changing birth control methods. Some apps even fail to account for pregnancy: one survey participant noted that "*a pregnancy, a baby, and a year and a half of breastfeeding later, the app thinks my normal cycle length is about every 700 days!*" Apps also assume diligence in use and entry, which is known to be unrealistic in personal tracking (Epstein et al. 2015). Participants noted that logging their period's late arrival, or forgetting to record when their period ended, impacted the app's ability to make future predictions accurately. The realities of everyday use of cycle tracking apps often impede the success of the predictive models which motivated the app's inception and reinforce natural family planning.

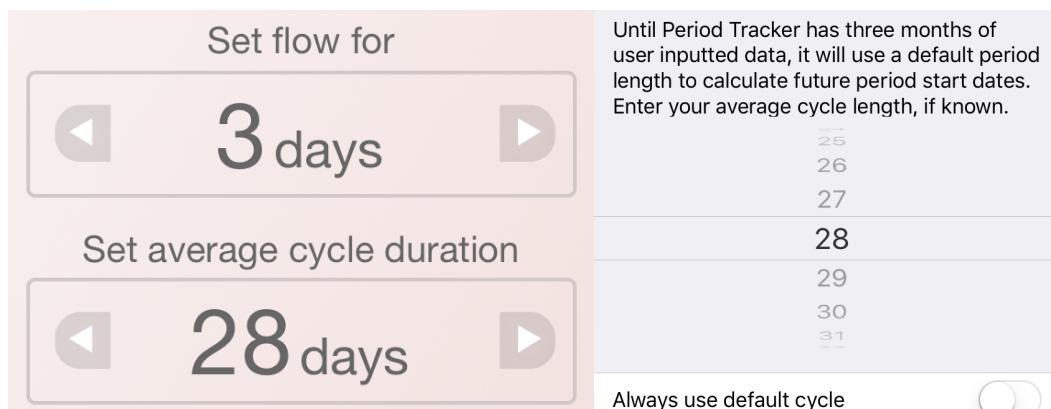


Figure 2. Apps such as My Cycles (left) and Period Tracker (right) typically ask for average cycle length and flow duration to aid in prediction. Although this prediction may later be improved by journaled

data, it is not resilient to variations due to irregular cycles, stress, birth control, or forgetting to journal.

To address these discrepancies, designers of menstrual tracking technology could examine additional techniques for modeling and communicating predictions. For example, evaluating interfaces which describe ovulation and period arrival as probabilities, rather than less-reliable binary predictions. At minimum, apps should allow people to correct a prediction when it falls out of line with reality, in order to be resilient to the myriad reasons why a prediction is inaccurate (e.g., changes in cycle, forgetting to track).

Menstrual tracking aesthetics

Similar to trends observed in the context of apps to support pregnancy (Peyton et al. 2014), most menstrual tracking apps we analyzed used stereotypically feminine attributes throughout their interfaces, such as predominantly pink color palettes or frequently using images of flowers and hearts (Figure 3). Though some people reported appreciating the particularly brand of femininity represented, most viewed it as a negative design trait. One participant described the design as trying to “*dumb it down*,” leading her to wonder “*why can’t keeping track of my menstruation be a professional and organized task?*” Many participants sought out apps which had more neutral color schemes, with 38 reviews praising Clue’s relatively neutral aesthetic (Figure 1, right).

Though some participants felt comfortable sharing their menstruation information, the feminine aesthetics and often-obvious naming of apps (e.g., Period Tracker, Period Diary) sometimes interfered with other’s desire to keep their menstruation private. For example, one participant mentioned she “*used to be embarrassed when other people looked at my phone and saw a bright pink tracking app,*” which prompted her to switch to a design with a more neutral aesthetic. Others felt the notifications interfered with their ability to keep their menstruation private, disabling them as a result. Options for a more neutral design aesthetic and more subtle phrasing in notifications, as well as less conspicuous app names can help people who desire keeping their menstruation information personal.



Figure 3. Most period tracking apps we observed employ feminine, flowery, pink aesthetics, such as the main screens of Period Diary (left) and P. Tracker Lite (right).

Representations of gender and sexuality

Further, we observed the apps we reviewed often make heteronormative assumptions about the people tracking their menstruation and reinforce binary conceptions of gender. Participants who identified as non-binary or male struggled to find apps which “*didn’t misgender me*,” as one user described, or gender-neutral language. For example, at the time of the study, the Glow app (Figure 4, left) directs anyone who identifies as male to an alternate view of the app which focuses on penile and testicular health.

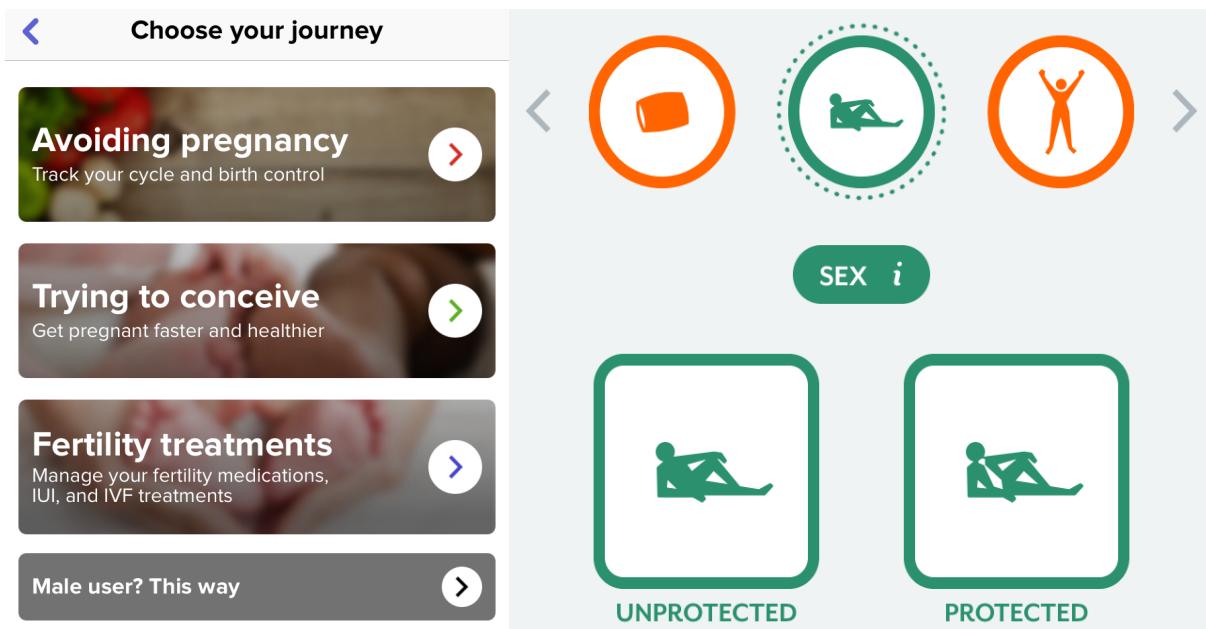


Figure 4. The design and language in many menstrual tracking apps encode heteronormative assumptions. In Glow (left), people who identify as male are directed to an alternate view of the app. Clue’s iconography (right) suggests a male sexual partner. We note that since conducting this research, Clue’s updated their icons for logging sexual activity to be abstract rather than anthropomorphized.

When supporting logging of sexual activity or sharing of data, apps often assume that a person's sexual or relationship partner identifies as male. For example, at the time of the study, Clue provides two options for logging sex, both of which use icons suggesting a male partner (Figure 4, right; we note that since conducting this research in 2016, the icons have been updated to be abstract representations). Other apps, such as My Period Tracker, only support asymmetric sharing of menstrual data (e.g., sharing information about one's cycle with exactly one partner who is not collecting their own data).

Fertility focus

The emphasis on ovulation information (the main screens of apps in Figure 1) and inclusion of fertility tips led participants to feel that apps were primarily designed to support people in trying to conceive, rather than the range of goals they brought to tracking (e.g., a general health check, avoiding pregnancy). Beyond feeling their goals were secondary, some participants felt uncomfortable with this focus. For example, some teenage participants stressed that they felt “*too young*” to care about fertility information. Participants who struggled with infertility felt the ovulation information served as a

reminder of their struggles. One participant said, “*I am no longer trying to get pregnant and I don’t like the reminder of TTC [trying to conceive] or the tiny glimmer of hope that maybe by magic this will be the month when a miracle happens.*”

To overcome design challenges around heteronormative and reductive assumptions, we suggest that apps utilize gender-neutral aesthetic themes and avoid gender-suggestive iconography or text. More people will benefit from a gender-agnostic aesthetic, but designs should at minimum offer multiple themes or profiles. Designs should enable hiding ovulation and sexual activity information to allow people who do not wish to see this information to avoid it, or remove these fields default display options.

As they exist now, the design of apps and tools for menstrual tracking fall short of addressing the needs and expectations people have expressed to us as important, from prediction to aesthetics to tracking goal to inclusion. The desire for alternatives is expressed succinctly by a respondent who lamented “*I’ve tried 4 apps. They all suck... I would think a creative woman would’ve created something better by now.*”

CASE TWO: Reimagining Menstrual Tracking through Participatory Design

To pursue avenues for challenging issues related to narrow conceptions of menstrual tracking, I (Fox) collaborated with Information scholars Menking and Eschler and Bioinformatics scholar Backonja to conduct a multi-part research program, described here as the second case (Eschler et al. 2018; Fox et al. 2018). During the initial stages of research, we first reviewed perspectives on menstrual literacy from popular and publicly available health information-related websites, alongside the data collection techniques and interface characteristics of a sample of menstrual tracking apps (described in more detail in (Eschler et al. 2018)). One of the most striking disconnects between the menstrual literacy resources and apps we examined was the difference in focus on fertility (echoing the fertility focus highlighted in the previous case). To further explore design potentials in the space of menstrual tracking, we then took up collaborative methods of design (described further below) to imagine how tracking technologies might be developed differently, to incorporate the concerns of a multiplicity of menstruators. In what follows, we focus on the results of these participatory encounters.

Period Packets: Reimagining the app protocol

Inviting further reimagination of the menstrual tracking app protocol, we released a set of participatory design objects in the form of design packets (Gaver et al. 2001; Pierce and DiSalvo 2017)—here called Period Packets—asking participants to make their own sense of menstruation through a series of open activities. Drawing on the methodological tradition of research through design (Zimmerman, Forlizzi, and Evenson 2007), and more specifically the approach of cultural probes (Gaver et al. 2001), we took up ambiguity and provocation as a resource for conversation and collaborative design. In an early example of this method, design researchers Bill Gaver and Tony Dunne’s design team used packages of materials, with postcards and disposable cameras, to engage with groups of older adults across three geographically distant retirement communities. In doing so, the design team aimed to reverse the promise of improving social life through technology, a promise “that tries so hard to be rational” (Gaver et al. 2001, p.7). Instead, they sought a means of supporting the idiosyncrasies of everyday life, from chatting to creative expression. The outgrowths of these encounters are meant to be “generative of design potentials and possibilities, ones loosely directed toward more preferred states” (Pierce and DiSalvo 2017), rather than discrete solutions for all. In the Period Packets, we posed questions on how respondents formed their own sense of the menstrual process, including prompts such as: “How do you

know your period is coming? What does it mean to know your period? How does your period fit into your life? Record a week of your period, focusing on what's interesting to you. With the physical packets, we included markers, paint, and other craft materials, as well as a link to an online folder meant to receive video and audio files, offering opportunity for expression through any means respondents saw fit—from sketches to sound files.

We distributed the packets online, via the project's own website, Instagram account², and through email, sending the call for participation to our own personal and professional networks and snowballing from there. We also circulated the packets through the physical mail—initially, sending sets of packets to queer and feminist bookstores across the country and later fulfilling requests for physical packets received through the project's website. Ten people completed and returned the packet, either through an online form or physical mail, offering longform responses to the open-ended questions and describing their own mechanisms for menstrual sensemaking both visually and textually.

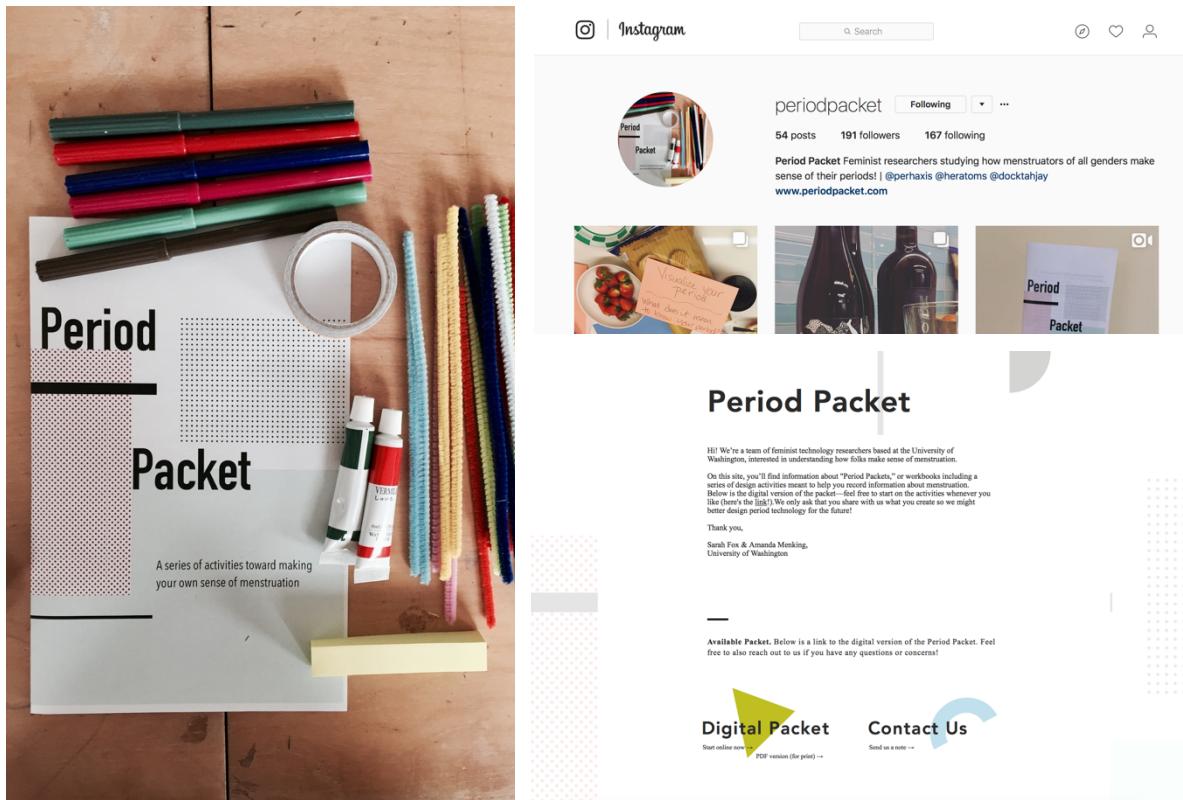


Figure 5, Circulated online and through the mail, the Period Packet invited participants to reimagine the period tracking app by illustrating their own menstrual sensemaking practices, through both textual description and craft techniques.

Through their reflections, respondents troubled notions of the body that configure it as wholly knowable, controllable, or that presuppose women's bodies, in particular, as primarily for reproduction.

² The project website with the digital version of the Period Packet can be accessed at <http://periodpacket.com/>. The Instagram account can be found under the handle “PeriodPacket”: <https://www.instagram.com/periodpacket/>.

For instance, some described existing methods they used to collect information about their menstrual experience, but that might not match the data types and forms of capture that are featured in tracking apps, such as one respondent who noted regularly, “[recording] the amount of fluid captured in my diva cup or pad or underwear throughout the day, color, viscosity, presence of any clots or cervical fluid” in order to compare relative volume across their cycle. Others suggested they had a general sense for where they were in their cycle based on corporeal experience and avoided formal data collection, such as one respondent who reported being able to “[...] tell based on discharge and other bodily changes. I don't take my temp each morning cuz [Sic] i am the worst at consistency but i can tell other ways, like body aches, getting emotional, etc.” These responses begin to suggest that existing practices of sensemaking might evade current apps, but could complement and extend them by allowing for more flexibility and variability across individuals' experiences.

In what follows, we highlight two vignettes to illustrate expanded notions of measuring menses introduced and illustrated across the pages of the packets we received.

Modes of Reflection

One respondent Jenna³ reported charting and journaling on her menstrual cycle experience every day (see Figure 6) and described, “organizing my life around my cycle.” She further noted this recognition of the body in daily practice fostered existential exploration and reflection:

“I think knowing my period involves understanding why I get it, and situating it in the context of other female-bodied people/creatures and the elements. I used to think that ovulation happened during a period and that the whole deal was just a pain in the butt. Now I understand the process a lot better and feel glad when I shed my uterine lining because it means my body is working as it should. Like the cycles of birth, death, and rebirth that we see in nature (phases of the moon, tide, seasons) with each cycle I am letting go of old stuff my body doesn't need and beginning anew.”

Here, Jenna gestures toward forms of sensemaking practice that currently fall outside of what designers and technologists developing apps recognize. Rather than tracking to find optimal days for conception, for instance, she hoped to foster a relational perspective through recordkeeping—a practice as much about making sense of her place in the world as it was about predicting a next period.

³ To protect respondents' privacy, we use pseudonyms throughout the accounts in this chapter.

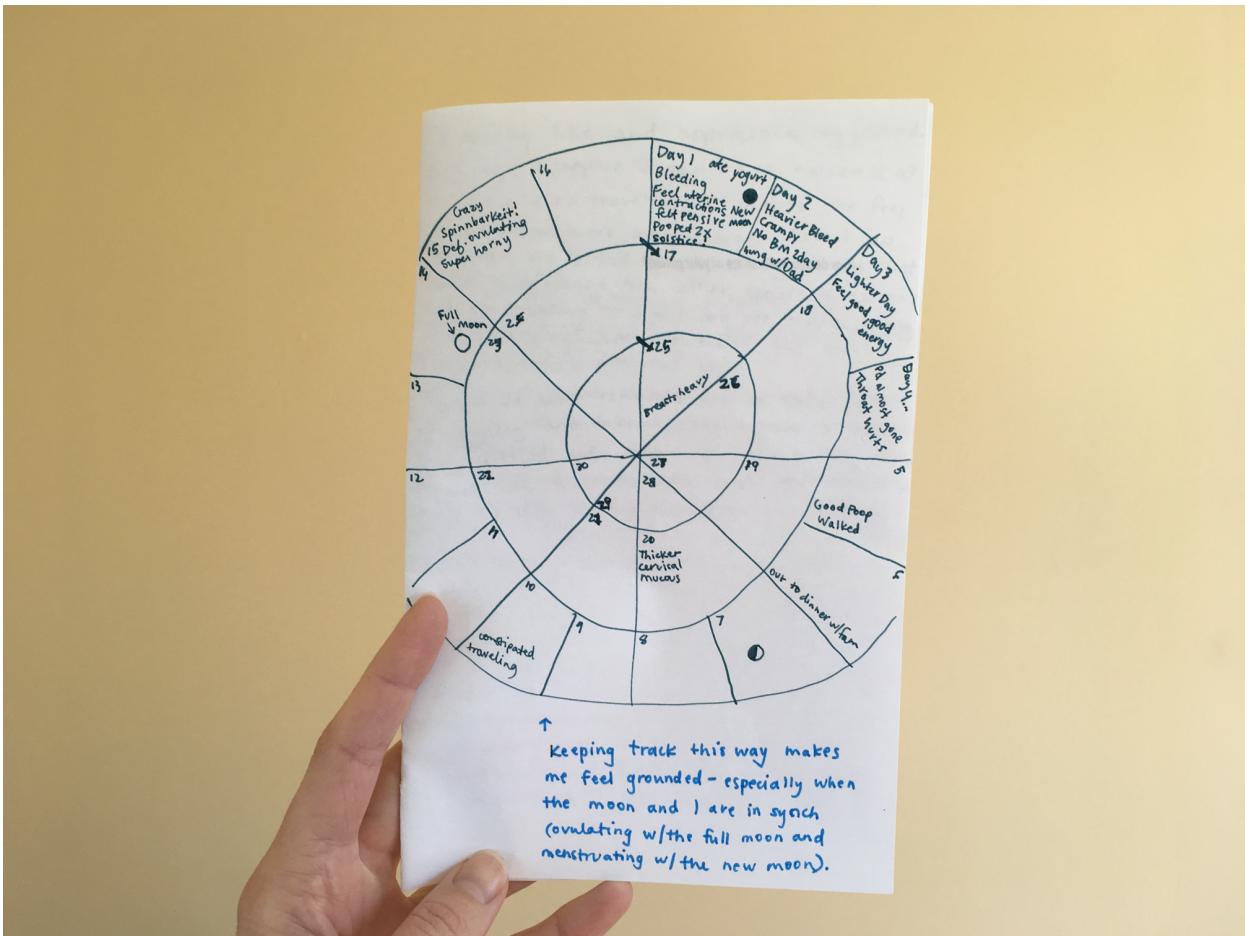


Figure 6, Respondent Jenna charts and journals about her menstrual experience every day. Within the pages of the Period Packet, she describes her motivations for pursuing this practice and offers an example of one such entry.

Affirmative Design

For others, prediction played a crucial role; not necessarily for the ways in which Levchin and others might imagine (i.e. ovulation, for those trying to conceive), but with no less consequence. One respondent Robert, who identified as a transgender man, detailed through text and imagery his traumatic experiences with menstruation (see Figure 7), which he described as causing “*the most most dysphoria*” for him. Tracking, to Robert, was a means to prepare, both materially and emotionally for what was to come with his period:

“[My period] used to be a thing I had to emotionally prepare for (either by closing off entirely and pointedly not thinking about it much more than “okay time to change tampons, don’t look at it, etc.”) So knowing when it was coming via when I realized the aching correlation, using a tracker app, etc. made it a lot easier on me since I could reliably know when and not have to look at a calendar in dread”

Yet, feelings of dread had not totally subsided, even with transition, Robert noted. Instead, he described having occasional periods since beginning testosterone shots, which could be more frequent if for some reason he was not able to take the prescription:

"If I forget/can't get it refilled on time it becomes more and more of an anxiety trigger until I can. If I do just completely forget and then get a period I'll immediately (if I can) do my shots to end it ASAP [...] Oddly, starting T has made the occasional accidental period easier to deal with emotionally compared to before. Not sure why but I'm not complaining! Now, it's just a matter of "oh opps," go do a tampon, change underwear if necessary, then go back to what I was doing. I know that occasionally my depression would be worse the week/a few days before when I'd look back in retrospect, so sometimes would explain it."

In the above statement, Robert moved through his changing relationship to menstruation, one that had triggered intense experiences throughout his life, but was becoming easier handle as it became more sporadic. This might seem paradoxical, at first: how would an “accidental period” be easier to deal with? That it was occasional and accidental made all the difference to Robert. It was not a constant trauma anymore. If anything, it was a reminder to take care of himself and to take time to get the testosterone he needed.

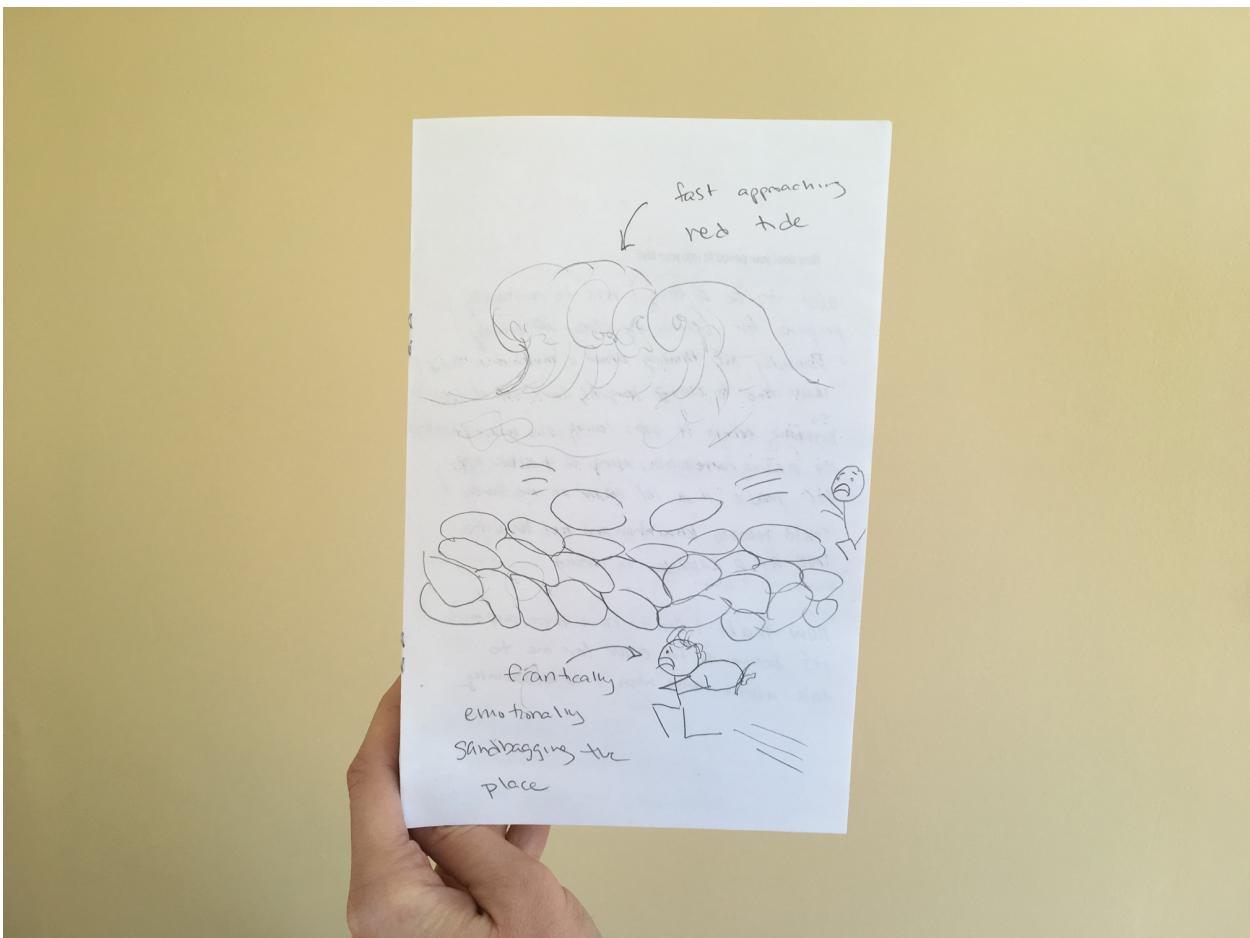


Figure 7, Through illustration, Robert recalls how tracking was a matter of materially and emotionally preparing for what was to come with menstruation—exacerbated feelings of dysmorphia.

Through the circulation of the Period Packets we aimed to acknowledge a sense that no two menstruators are the same, while also recognizing all are experts of their own experience. Queer, unpartnered, infertile women, those uninterested in procreation, and transgender folks are all too often left from consideration in the design of menstrual tracking apps. Yet, throughout their packets, respondents offered new types of data and forms of interaction such as record of endometritis pain and the charting of testosterone levels alongside period frequency. In doing so, respondents introduced new layers of depth and understanding to the period app protocol. A depth, we argue, that should not be limited by technological prescription, but rather supported through further design experimentation.

CONCLUSION

Across the two cases detailed in this chapter, we call for more and different sorts of designs in the space of menstrual tracking—ones that might be more reflective of the variety of interests and needs of menstruators (concerns only partially embodied in the accounts we have shared here). With the first case, we aimed to identify points where existing menstrual tracking apps do not match people's needs, preferences, and identities. Through analysis of app reviews, survey responses, and interviews, we uncovered a range of situations which cause people discomfort or to feel excluded by their apps, including assumptions of goals (fertility), aesthetic preferences (pink and flowery imagery), gender identity (female), and sexual partner (one male partner). Future technology should opt for design defaults which avoid these assumptions, or at least offer flexibility in what data is presented and how it is presented to allow people to customize interfaces to their liking. With the second case, we sought to highlight forms of menstrual recordkeeping and sensemaking already in active use, alongside or beyond the app. Through the form of the Period Packet, we invited respondents to engage and express these sometimes implicit practices—ranging from recognizing growing aches and pains to daily journaling. The responses they returned suggest that though their existing practices of sensemaking might evade current apps, technologies may have a place if carefully managed. Toward creating complements and extensions to existing practices, for instance, technology could support flexible and dynamic sorts of accounting.

Though it may seem there is a long way to go before measuring menses is a practice supported through mainstream technological development, our two case studies suggest there may be productive overlaps, ways in which menstrual tracking technology can better align with people's needs, and preferences. By critiquing existing technologies, our aim is not to point at a problem and walk away, but rather to offer generative openings on the sorts of designs that could exist alongside the existing terrain of apps.

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