

## Reframing Design Problems Within Women's Health

HOMEWOOD Sarah

IT University of Copenhagen  
shom@itu.dk  
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This paper begins by offering a feminist reading of the visible increase in design research within the category of “women’s health”. A critical feminist reading of menstrual cycle tracking technologies is then used to investigate how the way that we frame design problems influences the artifacts produced and their impact within society. I argue that by re-framing design problems from the perspective of third and fourth wave feminism we can develop women’s health technologies that are more affirmative, inclusive and which celebrate difference and reflect the complexity around what it means to be a woman in today’s society. I illustrate the potential of this reframing by presenting three approaches to the design of menstrual tracking technologies that better adhere to current feminist ideologies.

*Women’s health; design problems; feminism; menstrual cycle tracking technologies*

### Introduction

Women make up half the population, and are not a minority. The female body is capable of experiencing more actions, processes and transitions than the male body, such as pregnancy, breastfeeding, menopause, post-partum trauma and menstrual cycles. These physiological processes create many more openings for the application of technology and design than for the male body. As the creation and development of digital artifacts is an act of design (Löwgren and Stolterman, 2004), it becomes relevant to address and critically appraise the design process behind the application of technology to the female body and its particular physiological processes.

According to search results for “women’s health” as author-defined keywords in the American Computer Machinery (ACM) Digital Library database, research defined as relating to women’s health did not appear until the 1990’s and dramatically proliferated from there on, particularly within the last ten years. Currently there are five thousand articles using “women’s health” as an author-defined keyword (ACM, 2017). This database holds most major conferences and journals on research into new technologies. The subject of women’s health has been an increasingly present topic in workshops and publications presented at international conferences within the fields of human-computer interaction (HCI) and interaction design including two CHI workshops in the last five years dedicated solely to women’s health (Balaam, 2013, 2017). Experiences in women’s health such as



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breastfeeding have been reimagined through participatory design of breast-pumps (Ignazio, Hope & Churchill, 2016) and Feedfinder (Balaam et al., 2015), a mobile application that facilitates the sharing and reviewing of public places suitable for breast feeding. Research related to menstrual cycles includes the design fiction PeriodShare (Søndergaard & Koefoed, 2016) that uses the taboo around menstruation to address the conventions of privacy around bio-data, and the Menstrual Machine (Ozaki, 2010), a speculative wearable device that simulates the experience of menstruating. The form, aesthetic and functionality of menstrual cycle tracking technologies has previously been discussed within HCI and interaction design in papers such as Epstein *et al.*, 2017.

Feminist HCI and interaction design has also emerged in recent years and there are many parallels and causal links between the two trends. HCI and interaction design have gained an “increasing awareness and accountability for its own social and cultural consequences” (Bardzell & Bardzell, 2011 p.675). Following this, the application of feminist theories has been used within design research in order to reach societal goals such as gender equality. Feminist theories have been used to highlight the influence of the position of the researcher on knowledge produced (Prado, 2014), and to include the marginalized within the design of technologies (Ignazio, Hope & Churchill, 2016).

In this paper, I will apply a collection of western feminist epistemologies to discuss the causes of latency in the research and development of women’s health related technologies and possible reasons why and how women’s health has become an emergent trend. A critical feminist reading of menstrual cycle tracking technologies is then used to question the implications of how design problems are defined. I then illustrate that a critical stage of analysis when defining what we posit as a design problem can yield innovative, affirmative and feminist design artifacts that celebrate difference and inclusivity.

## **“Women’s Health” as an Emergent Trend**

### ***Why Did It Take So Long?***

One way of grounding causes for latency in the development of technologies for women’s health could be through the concept of the “othering” of women that is widely used and discussed within feminist theory. The term “othering” comes from Simone de Beauvoir’s statement “He is the Subject, he is the Absolute, she is the Other” (1949). With this statement Beauvoir claims the view the world holds prioritizes the experiences of men. This is extended by Rosemary Garland-Thompson’s definition of the norm, or “normate”, as the white, young, healthy, heterosexual North American man (1997). Women are categorized alongside the remaining population including people from other races, sexual orientations and people with disabilities. These outlying groups are deemed abnormal or “extraordinary” (Ibid). A similar search for “men’s health” in author defined key words in the ACM Digital Library returned only one result. However, if we follow Beauvoir and Garland Thompson then it could be said that a search of the ACM digital library for the keyword “health” would return research that were androcentric, this term refers to the prioritising of male experience over female experience that results in the marginalization and subjugation of women. These “health” technologies would therefore hold a bias towards male experience from the ideation phase to the methods applied in user research. Epstein et al. (2017), describe how when Apple launched their Healthkit app in 2014 they excluded menstrual cycle tracking from the features it provided, only adding it later following a public outcry. This case highlights assumptions held within the development of technologies about the body of the user. If the male body represents the norm, then an intentional effort is then required to design specifically for the female body. This directed effort could even be labelled as a separatist act, where men are excluded from the design process and discourse. As stated in Bardzell, 2010, a separatist act goes against the “universalizing aspirations” of technology where technological artifacts should be relevant and useable by all, regardless of sex, gender and culture.

## ***Why and How Women's Health Became an Emergent Trend***

The question of why and how women's health has become an emergent trend can be answered through the use of particular feminist theories on scientific research. I will now propose that an increase and improvement of research on women's health within design fields can be seen to be evidence of the application of the epistemologies of feminist empiricism, feminist standpoint theory and the use of feminist design methodologies. This analysis brings to light the role that feminism has played in driving change up to this point. This allows reflection on the current status quo and makes visible the work that is still to be done within design research in order to work towards feminist goals within society.

### ***Feminist Empiricism***

Feminist theorist and scientist Sandra Harding outlines existing feminist epistemologies that aim to correct androcentric methods and cultures within scientific research (1986). I will apply these epistemologies, or perspectives on the production of knowledge, to design. The first perspective Harding presents, feminist empiricism, "argues that sexism and androcentrism are social biases correctable by stricter adherence to the existing methodological norms of scientific enquiry" (Ibid, p.24). Applied to the fields of design, feminist empiricism holds that androcentrism and sexism could be correctable through an increase in the diversity of those working within the field. Therefore, an increase in research on women's health could be due to social movements such as women's liberation that have resulted in more women taking up jobs as designers and researchers. Feminist theorist Sara Ahmed (2006) uses the term "orientations" to discuss the fact that our perception of the world is influenced by "what we can face at any given moment in time." (Ibid, p. 547). For female designers, the female body is present to them in different ways than to male designers. Female designers therefore may feel motivated to attend to the female body through the design of women's health-related technologies. Bardzell (2010) describes the increase in inclusivity within HCI and interaction design as evidence of pluralism. Pluralism is the opposite to universalism and "embrac(es) the margins both to be more inclusive and to benefit from the marginal as resources for design solutions" (Ibid, p.1306). It could therefore be argued that designers as a population have become increasingly gender diverse, and this has allowed for the development of non-universalising technologies specifically designed for women's health.

### ***Feminist Standpoint Theory***

The second perspective outlined by Sandra Harding is feminist standpoint theory. This theory recognises that knowledge is constructed, not found (Harding 1986), and that the location and perspective of the researcher will influence the qualities of knowledge produced. From this perspective, an increase in research carried out by female designers can therefore be posited as producing a higher quality of research on women's health. Rather than leading to essentialism by stating that men are disqualified in the design of technologies for women's health, this epistemology celebrates the situated knowledges (Haraway, 2006) of female researchers in developing technologies for women's health that better suit women and the female body. An example of the application of standpoint theory and situated knowledges is the project FemSpec (Rossman, 2008). FemSpec re-imagines the design of the speculum, which was historically designed from a dominant medical and masculine position without consideration for the comfort of the female patient. The company behind FemSpec, FemSuite, is comprised of one male and two female gynaecologists. FemSuite utilized their own personal experiences as well as the experiences of female research participants to design an improved speculum that, through a process of participatory design and subjective experiences, improved the experience of cervical examinations that are a vital aspect of women's health.

### ***Feminist Methods of Enquiry***

Feminist methods of enquiry can be seen to have improved research on women's health through the application of feminist research methodologies and methods. Although the increase and improvement of research on women's health within HCI and interaction design can be seen to be

evidence of feminist empiricism and feminist standpoint theory epistemologies, Harding critiques both epistemologies by stating that neither change the “existing methodological norms of scientific inquiry” (1986), p.24). Donna Haraway’s analysis of the influence of the researcher’s own lens of dominance evident in methodologies and methods used within a primate study in the 1930s (2006) reveals the “embodiment of social relations in the content and basic procedures of a natural science in such a way as to expose the fallacies of the claim to objectivity” (Ibid, p.12). Within design research, it has been shown that certain methodologies can support feminism through their ability to expose the influence of the researchers own lens of bias and privilege on knowledge produced (Søndergaard & Koefoed, 2017). Ignazio, Hope and Churchill (2016) and Prado (2014) have proposed that methodologies such as participatory design and critical and speculative design offer feminist tools that include women as a marginalised group in the design process and imagine alternative futures in order to reject the reification of existing biases within society. Bardzell (2010), offers a “set of feminist interaction design qualities intended to support design and evaluation processes directly as they unfold” (Ibid, p.1301). Bardzell proposes that the application of qualities such as *advocacy, ecology, embodiment, participation and self-disclosure* can yield a generative approach to feminist HCI and interaction design. These feminist methods of enquiry can be seen to combat androcentrism through *how* research is conducted. These examples provide roadmaps for those wishing to conduct feminist research and can be seen to have improved research on women’s health through the questioning of “existing methodological norms of scientific inquiry” (Harding, 1986, p.24).

## **Menstrual Cycles as a Design Problem**

As argued above, feminist empiricism, feminist standpoint theory and a range of feminist design methodologies are apparent causes behind the increase and improvement of research on technologies for women’s health. However, Sandra Harding discusses how androcentrism often lies in the defining of the problem area where the research will take place; “a key origin of androcentric bias can be found in the selection of problems for enquiry, and in the definition of what is problematic about these phenomena” (1986, p.25).

How design problems are conceived and considered within design theory has changed drastically over the decades. In the 1950s and 1960s first generations of design theorists and practitioners “viewed design as a process of systematic problem solving” where the designer was an “objective, scientifically trained expert” (Löwgren & Stolterman 2004, p.154). Later generations rejected the perspective that there are pre-existing problems to be solved by designers through rational and objective dissemination and thought, and instead acknowledged that it is the designer themselves who create and define design problems.

*Design problems are "indeterminate" and "wicked" because design has no special subject matter of its own apart from what a designer conceives it to be... in the process of application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances. (Buchanan, 1992, p.16).*

If we follow the fact that design problems are solely conceived of by the designer, then this highlights the influence of the individual designer’s social and cultural positions and beliefs and politics on the resulting artefacts of the design process. Through using menstrual cycle tracking technologies as an example, I now propose that androcentrism can still be seen to be evident in how design problems are framed within the development of technologies for women’s health.

## **Menstrual Cycle Tracking as Biopower**

Menstrual cycle tracking is not a new phenomenon; women have tracked their menstrual cycles through analogue methods for centuries. Though the digitisation of menstrual cycle tracking technologies allows new functions and possibilities, current technologies still closely resemble analogue tools. The key differences between digital and analogue tools is that digital tools are screen based, interactive, provide apparently scientific information about each phase of the menstrual

cycles and that they can predict the timing of the menstrual cycle through the use of algorithms and data-gathering. If menstrual cycles have historically been used as an argument for the subjugation of women (Shildrick, 1998), and analogue menstrual cycle tracking tools work towards the concealment of menstrual cycles in society (Bobel, 2010), then it can be seen that menstrual cycle tracking technologies that closely resemble their analogue forebears, are designed as solutions to the same longstanding problem of the uncontrolled and objectionable female body.

Epstein et al. state “women often track their menstrual cycles without an explicit goal of action, but instead for awareness of their place in their menstrual cycle.” (2017: 6876). It could be argued, however, that “awareness” is a goal in itself, not only for the individual but also for society. It has been discussed that there is a wider societal goal behind self-tracking that relates to Foucault’s concept of biopower (Leder, 2016; Lupton, 2016; Schüll, 2016). The term biopower refers to the promotion of the practice of self-discipline on an individual scale as a tool to govern the population (Foucault, 1990). In the context of biopower, self-tracking technologies provide us with the tools to monitor and discipline our bodies, as the uncontrolled body, such as an overweight, ill or erratic body that is seen to place economic burden on the wider society is viewed as undesirable and uneconomical (Lupton, 2016, p.52).

Historically, the female body has been considered to be uncontrolled. This has been used as an argument for the subjugation of women;

*for women losing control is only to be expected. Though past explanations, such as the concept of the wandering womb, have been superseded by new constructions of female disorder, sophisticated medical references to hormones, pre-menstrual tension, menopausal irritability and the like are no less rooted in an essentialist view of women’s bodies and women’s nature.” (Shildrick, 1998, p. 27).*

In light of this, it could be said that menstrual cycle tracking technologies represent tools of biopower used to control and mitigate the symptoms of the menstrual cycle in order to allow the female, menstruating body to perform in society as a non-menstruating body, male, body. Although not all female bodies menstruate, for example pre-pubescent girls, trans-women or post-menopausal women, generally the societal understanding of the non-menstruating body is the male body. A non-menstruating body can therefore be seen to be the desirable and “normate” (Thomson, 1997) body within an androcentric society, where the male body is valued above all others.

### ***Androcentrism Evident in Menstrual Cycle Tracking***

I will now present evidence that menstrual cycle tracking technologies re-enact androcentric ideals throughout three key phases of the menstrual cycle.

#### ***Menstruation***

One key motivation for many users of menstrual cycle tracking technologies is being able to predict the onset of menstruation (Epstein et al., 2017). This is in order to ensuring that they are prepared with the appropriate tools such as tampons, sanitary towels or menstrual cups to prevent menstrual blood seeping through their clothes and being visible by others or transferring onto furniture. Menstrual blood is currently considered taboo in many societies and cultures across the world, and a backlash against these taboos has been the Free Bleeding movement what gained popularity in Western societies in 2014 when Kiran Gandhi ran the London Marathon with her menstrual blood visibly flowing through her clothes (Gandhi, 2015). Free Bleeders take pride in the visibility of menstrual blood, often using social media as a platform to share images and videos of themselves. The concealment of menstrual blood can be seen to be the concealment of female embodiment in favour of a non-menstruating, controlled, male embodiment.

#### ***Ovulation***

The expectation for the menstrual cycle to be controlled by individuals is also motivated by the fact that the ovulation phase of the menstrual cycle dictates the body’s fertility. Most forms of

contraceptives, such as hormonal contraceptives and IUDs, are still designed to be used by the female body, with the exception of condoms. Menstrual cycle tracking has long been used as a form of fertility managements, particularly within certain religions such as Catholicism. Advancements in technology and data science have resulted in the development of algorithms and digital temperature tracking technologies that now mean that menstrual cycle tracking apps can be marketed as a secure form of contraception. The Natural Cycles Bluetooth enabled thermometer and accompanying app gained FDA approval in 2017 (Berglund-Scherwitzl et al., 2015). This product heralds a whole new future of contraceptive technologies. Deborah Lupton's review (Lupton, 2015) of sexual and reproductive self-tracking apps found that apps on the subject of sex and fertility designed for women focused on medicalisation and risk of disease and pregnancy. For men, these apps were designed with an emphasis on physical performance, duration and competition. For the individual woman to be able to control their own fertility and reduce unwanted pregnancies is clearly beneficial for the wider society economically. Fertility management as biopower is therefore seen to be designated to women through the use of menstrual cycle tracking technologies.

### *Pre-Menstrual Syndrome*

A third aspect of the menstrual cycle that can be seen to be controlled through menstrual cycle tracking is pre-menstrual syndrome (PMS). PMS is commonly defined by symptoms such as irritability, tender breasts and bloating and occurs around a week before menstruation. Though the existence of PMS is contested in certain areas of scientific research (Romans et al., 2012), PMS is an accepted phase of the menstrual cycle in societal discourse. Most menstrual cycle tracking apps include some form of PMS logging tools and use this to predict when PMS will occur in future cycles. Epstein et al.'s study (2017) found that menstrual cycle tracking allows users to understand, and sometimes mitigate, their own emotions. As one of participant in their study stated "sometimes I'm really emotional and irrational and I can look at my tracker, see that my period is due in a week or less and chill out and realize I'm PMSing instead of having real feelings." (ibid, p.6879). The labelling of emotions experienced during PMS as un-"real" relates to a common theme in societal discourse where PMS is represented as a phenomena that takes over the body and renders it altered from its "real" state and thus uncontrolled and devoid of rationality.

The Testy Totem app (Testy Totem, 2017) is designed for "husbands/boyfriends/partners whose significant other exhibits PMS, or moodiness associated with their menstrual cycle." The app asks the user to input details of the menstrual cycle it would like to track, such as average length and the beginning of menstruation in order to synchronise with it. Red, green and yellow images of Totem's with varying facial expressions then indicate which stage of the menstrual cycle the person they are tracking is in. "Green means everything is normal, the time of the month two weeks or more away. Yellow indicates that you or your totem is within two weeks of their menstrual cycle, and Red means you or your partner is one week from starting menstruation, the phase of the cycle most commonly associates with PMS or Pre-Menstrual Syndrome". The term "normal" to represent the non-PMS stage of the menstrual cycle labels the PMS-ing body as being ab-"normal", just as their PMS-ing body was un-"real" for Epstein et al.'s participant. Whether this technology is designed for the benefit of both the user and the partner being tracked is doubtful. Testy Totem does not appear to be designed as a collaborative tracking tool such Clue Connect that lets the user track their own menstrual cycle share their data with others (Clue, 2016). Theoretically the Testy Totem could be used without the consent or knowledge of the partner, thus representing a technology for un-consensual surveillance. The design, function and language used by Testy Totem gives a clear indication of how PMS and women experiencing PMS are perceived by the designer(s), predominantly as a negative phenomenon which requires management. Though the description does not explicitly say what the goal of the app is, the in-app explanation advises the user to "BE ON YOUR TOES" and "KEEP YOUR MOUTH SHUT" when the cycle that they are tracking is in the PMS phase. It therefore appears that the app is designed for users to be able to adapt their behaviour according to their partner's menstrual cycle, therefore controlling the influence the menstrual cycle

of their partner has on their relationship. This relates to the direction that Epstein et al.'s participant gave to themselves to "chill out" once they are aware that their behaviour is due to PMS, thereby encouraging them to mitigate their own behaviour for the sake of others in society through the concealment of PMS and enacting a non-menstruating body instead.

## **A Feminist Re-framing of the Design Problem of Menstrual Cycles**

Here I will return to Harding's statement "A key origin of androcentric bias can be found in the selection of problems for enquiry, and in the definition of what is problematic about these phenomena" (1986, p.25). In avoiding androcentrism in the framing of menstrual cycles as a design problem, designers must aim to find a feminist alternative. As will be discussed below, after a brief presentation of conceptualisations of menstrual cycles in second and third and fourth-wave feminism, this can be a complex but generative task.

Androcentrism is not the sole possible framing relevant to menstrual cycle tracking technologies. Menstrual cycle tracking technologies can also be seen to be in accordance with the ideologies of early second-wave feminism. During this movement in the 1960s, women were encouraged to transcend their embodiment in order to reach political and public equality with men (Beauvoir 1948). For second-wave feminist theorist Shulamith Firestone (1971), gender equality would require the introduction of extra-uterine gestation that would relieve women of the burden of child-bearing. The goal for second-wave feminism was equality in all areas of work, family life and in public through eradicating the female gender and all its qualities entirely. Evidence of this can be seen through the introduction of tampons, that allowed women to conceal their menstrual blood entirely, and how The Pill was manipulated by women to skip the pause that allows menstruation that is built into the monthly prescription (Bobel, 2010). However, this ideological dream was later criticised by a large part of feminists as it implied that the "true potential" that could be reached through transcending the female body was the male body, thereby re-enacting androcentric bias in society.

The current, fourth-wave of feminism is still being shaped, but is grounded heavily in third-wave feminism, which emerged in the 1990s and is a notoriously difficult to define due to its emphasis on inclusion and non-boundary feminism (Snyder, 1995). Themes running through third-wave feminism are intersectionality; a result of a critique of feminist standpoint theory's universalizing labelling of "women" as one group. Intersectional feminism posits that all categories of race, class and sexuality must also be taken into account when considering the subjugated situations of women. As Claire Snyder writes; "By occupying female subject positions in innovative or contradictory ways, third-wavers unsettle essentialist narratives about dominant men and passive women and shape new identities within the interstices of competing narratives. There is no one way to be a woman." (1995 p.185). The emphasis on inclusion and choice of the individual at the core of third-wave feminism means that it is equally as feminist for women to choose to conceal their menstrual cycles, aligning themselves to the second-wave ideology of transcending their biology, or for women to bleed freely in public and choose not to adhere to societal taboos through discussing and displaying their menstrual cycles with pride (Bobel, 2010). This means, therefore, that there is not one clear, feminist framing of menstrual cycles as a design problem, though choice and inclusion are clear elements which distinguish feminist design problems from androcentrically biased design problems within this context. What will be presented now are three illustrations of future designs of menstrual cycle tracking technologies that can result from the re-framing of menstrual cycles as design problems that adhere to current feminist ideologies whilst continuing to reject androcentric ideals and the subjugation of women.

### ***Sharing the labour of fertility tracking***

By framing menstrual cycle tracking as a design problem that acknowledges that conception involves both men and women, fertility can be re-framed as a shared responsibility. As shown in Deborah Lupton's analysis of sex and fertility apps (Lupton, 2015), the majority of current apps designate the responsibility of fertility management to women. One example of menstrual cycle tracking

technologies that share the labour of fertility tracking could be technologies that notify both partners when ovulation is imminent. This allows both partners to either plan or avoid sexual intercourse during this time without the female partner acting as gatekeeper to their own bodies by permitting or rejecting sexual intercourse. As discussed above, apps such as Clue already offer users the opportunity to share their menstrual cycle data with others. This development allows users to share their menstrual cycle data with their partners, friends and family and was “the most requested feature since we initially launched Clue back in 2013.” (Clue, 2016). In contrast to the example of Testy Totem (2017), also presented above, where the surveillance of the menstrual cycle was non-consensual, users of Clue Connect have sole access until they invite people to share their data and can block this access at any time. The fact that this was “the most requested feature” shows that this is a facility that is appreciated by those that use menstrual cycle tracking technologies and points to further design work that could be done in this area. A related design example that addresses gender equality in fertility control is (Homewood & Heyer, 2017), where speculative design is used to imagine the impact on future users of the contraceptive microchip implant that will be released onto the market in the next few years. The contraceptive microchip implant lasts for sixteen-years and is accompanied by a remote-control component that enables users to control the flow of contraceptive hormones into the user’s bloodstream in order to permit or prevent conception. Within this project, the remote-control component was imagined as two necklaces, one necklace to be worn by each partner. When fitted together, these necklaces could disable the microchip implant and therefore allow conception. This imagining of the remote-control component proposed a more collaborative and mutual control of contraceptive methods through use of ritual. Both Clue Connect and the speculative remote-control component can be seen to reflect current feminist ideologies that reject the designation of labour around pregnancy and childcare solely to women through the sharing of the labour surrounding fertility tracking and fertility control.

### ***Alternative Representations of Menstrual Cycle Data***

The majority of current menstrual cycle tracking technologies are in the form of apps. These apps are available to users on their smart phones and are mostly kept private. In order to investigate conceptions of privacy around menstrual cycle tracking data, Søndergaard and Koefoed (2016) created PeriodShare, a design fiction of a connected menstrual cup that measures how much the user menstruates and posts this information to social media. This design fiction rejects societal taboos around menstruation in order to question what the form of representation of menstrual cycle data says about our relationship with the menstruating body in society. As shown by PeriodShare, through rejecting the concealment of menstrual cycles by visualising menstrual cycles data in public and visible ways, it could be possible to invert the taboo surrounding the subject of menstrual cycles in order to ask questions about how the menstruating body is viewed in society. In a society where there were no taboos or acts of concealment surrounding menstrual cycles, a multitude of design openings would present themselves; homes, clothing and public environments could be re-imagined to adapt to the changing body over the menstrual cycle. This could lead to a new wave of technologies that change with us and reflect the unstable nature of the female, and male, body. These technologies could hold inconceivable benefits for us and our relationships with technologies. As there is no one way to be a woman, all of these technologies would be customisable to how publicly visible user wish their menstrual cycle data to be. Menstrual cycle data could be abstracted to become unreadable to others, or represented more literally to give clear signals to those around them. To sum up, through considering menstrual cycles minus the surrounding taboo as a design problem, more innovative and feminist menstrual cycle tracking technologies could be constructed that may benefit women, and men, in our everyday lives and in our interactions with technology.

### ***Re-Defining Normal***

All aspects of menstrual cycle tracking technologies, from the algorithms used to make predictions, to the information given at every phase of the menstrual cycle, is built upon a framing of menstrual

cycles as a design problem that conceptualises the “normal” menstrual cycle as regular. This means that many women, especially those with conditions such as Polycystic ovary syndrome (PCOS), are not able to use current menstrual cycle tracking technologies as they do not have regular menstrual cycles. This clear exclusion of a whole group of women can be said to work against the inclusive ideologies of third-wave and fourth wave feminism. There is therefore much work to be done in the development of menstrual cycle tracking technologies that do not rely on a regular, “normal”, menstruating body, and are more suited to the subjective experience of every menstrual cycle and are customisable as such. This can be done by considering irregular rather than regular, subjectively experienced menstrual cycles as design problems.

Another re-framing of menstrual cycles in relation to what is considered “normal” is the delinking of gender from menstruation. Trans men who do not identify as female also menstruate. Menstrual cycle tracking apps have been shown to use gendered aesthetics and terminology that assumes that the user identifies as female (Lupton, 2015; Epstein et al., 2017). These apps re-enforce gender assumptions in society and exclude those who do not equate menstruating with being female. For trans men, menstruation can bring gender dysphoria and is often avoided by the use of synthetic hormones (Williams, Weinberg & Rosenberger, 2013). Through re-framing menstrual cycles as non-gendered physiological process, more inclusive menstrual cycle tracking technologies could be developed that no longer link menstruation with identifying as female. There may also be promising design openings to follow through addressing the emotional impact of the onset of menstruation for trans men. These technologies might help to avoid gender dysphoria and distress experienced.

Through rejecting the framing of menstrual cycles as design problems that assume that there is a “normal” menstruating body, menstrual cycle tracking technologies can be designed to include a wider range of people who menstruate. This will prevent the exclusion and pathologization of the irregular or non-gendered menstruating body and thus fulfil the inclusive and diverse ideologies of third and fourth-wave feminism.

## Conclusion

This paper has used particular western feminist theories to reason the increase and improvement of “women’s health” in design research and HCI. As Harding (1986) stated, androcentrism often lies in how a design problem is defined. Therefore, in further pursuing feminist goals within design, it becomes relevant to address androcentrism within the definition of design problems. Since design problems are defined by designers (Buchanan, 1992, p.16), designers can choose to either re-enact or challenge prejudices and inequalities in society through how they (we) frame aspects of the world around us. Were designers to choose to reject androcentrism in their framing of design problems, then a feminist framing can be applied. This paper has proposed that the complexities of third-wave, and consequently fourth-wave, feminism can be seen as generative to a design process. In current feminism discourse there is not one category of women, there are many, and there is no one way to *be* a woman. Feminist technologies designed for women’s health must reflect that. A feminist re-framing of menstrual cycles as a design problem is illustrated through three examples of menstrual cycle tracking technologies that celebrate difference, inclusiveness and complexity around what it means to be a woman in today’s society.

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About the Author:

**Sarah Homewood** is a PhD Candidate at the IxD Lab, IT University of Copenhagen. Informed by her background in contemporary dance, her interaction design research often addresses themes such as embodiment and self-representation.