The problem with gender-blind design and how we might begin to address it

A model for intersectional feminist ethical deliberation

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ABSTRACT

Gender-blind design hinges upon an assumption that designing equally is the same as designing for equality. That, however, is inaccurate, as gender-blindness is merely a synonym for neutrality. Neutrality, because it lacks a concerted effort to subvert, favors hegemonic values and epistemologies, which counters the purported aim of equality. Supposedly objective methods of analysis, such as data gathering and interpreting, are not deprived of this hegemonic bias either. As such, through an acknowledgment of ethics, the designer must recognize that they are, indeed, imbuing their values into their designs, which bears influence on the ways in which the user interacts and interprets those designs, a notion which is especially relevant to a field concerned with user experience. This may be done deliberately or by accident, but it is always inevitable. Ethics is, in this way, inextricable from the design process, and, thus, the present article aims to propose that designing for equality requires the designer to act as an ethical agent — responsibly, consciously, and knowingly — especially if one hopes to avoid a design which embodies and communicates oppressive notions. In particular, within the purview of ethics, and by making use of some case-studies and examples, it argues that designing toward gender equality requires not the more typical gender-blind approach, but rather one which is specifically gender-conscious. Further, this article also offers some suggestions as to how we might begin to act as ethical design agents and implement marginalized epistemologies into the design process.

CCS CONCEPTS

• **Human-centered computing** → Interaction design; Interaction design theory, concepts and paradigms.

KEYWORDS

Ethics, Gender-Blind Design, Feminist Design, Conceptual Model

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1 INTRODUCTION

The present article is intended to offer an intersectional feminist critique of the gender-blind tendencies permeating design theory and practice which fail to accommodate not just women but, indeed, any identity which deviates from the presumed male norm of the so-called 'average' or 'ideal' user. It is meant both as a denouncement of these embedded practices and a call for a more inclusive approach through a model proposal for an explicitly feminist ethical deliberation within the design process.

In focusing on gendered oppression within the design space — and only on some of its intersections — we do not wish to disregard any of the other seriously important factors which constitute underrepresented factions within design discourse. We are fully aware that, for some, issues such as class or race may constitute a greater priority, and that comprehensive and resonant analyses of how all these identities interact are not just necessary but urgent.

We are also aware that issues of gender, as well as some of their intersections within the matrix of domination, do not occur nor interact in a vacuum. They are part of a larger and more complex network of oppression which politically and systematically bounds all these marginalized epistemologies and value systems within each other, making a single-issue analysis, albeit constructive, still, inevitably, incomplete. Nonetheless, gender is a useful place to start exploring the oppression design is complicit in — not least in beginning to search for frameworks for gender liberation through ubiquitous design processes which permeate our lives, cultures, and societies. It must also be said unequivocally that gendered oppression does not solely mean the oppression of cisgender women.

In this pursuit, we must aim for knowledge and awareness regarding our own understanding of the oppression hierarchies and power dynamics in which we participate. Only in so doing may we be able to avoid communicating and reproducing these same hegemonic values and priorities which hinder the lives of so many real people.

Hence, this work, as an incremental contribution which builds on important previous work, hopes to propose a process whereby exhaustive ethical deliberation, in all its intersecting forms, becomes an explicit and integral a priori step of the design process. By centering marginalized epistemologies as an ethic unto itself, this approach hopes to provide some direction as to how we may begin to produce designed products, services, and spaces that are inclusive rather than exclusionary.

2 FEMINIST ETHICS AND THE DESIGN PROCESS

2.1 The relationship between ethics and design

Design, more than a single discipline or set of practices segregated by medium, is, as argues Ezio Manzini, above all, a process by and through which we shape and, in turn, perceive the world in which we dwell [1]. Design, in this way, implies some form of "material (re)configuration" [2] in service of a specific intended outcome. This outcome, as such, requires purpose. In the words of Herbert Simon, to design is to "[devise] courses of action aimed at changing existing situations into preferred ones" [3] (p. 111). In this way, design is also concerned with communicating meaning within the context of the society by and for which it designs.

Thus, as argues Ece Canlı, the reciprocity of design, as something which is both, and simultaneously, reconfiguring and being reconfigured, is crucial to an understanding of the effects and outcomes thereby produced [2]. All designed things are designed as a product of a desired outcome, originating from some interaction between outcome, process, and agent. In return, as Canlıwrites, "all designed things (from artifacts, spaces, sites, technologies, images to sartorial, digital, medical and cyber instruments) . . . act back and reconfigure the world;" and, in so doing, also our "identities, selves, . . . our everyday lives, environments, social structures, politics, relationships, movements, habits, value judgments and so forth [2] (p. 11). Design, as such, is invariably guided by the values and assumptions we hold, which are themselves based on what we consider to be legitimate knowledge. This is reflected in the way we think, what we think about, the values we prioritize, and, inevitably, in those that we reproduce. This may be done more or less consciously, but it is unavoidable. To design, thus, requires one to act deliberately on some desired intent to create some alternative conception, and also a vision as to how.

This is, in its very essence, an ethical matter. The question of which design solution is the best is, at its core, a question of which is the best choice, or set of choices. Decisions such as these — about what to do, what not to do, what should one do; what is right, and what is wrong — are all under the purview of ethics, it being the branch of philosophy that deals with the bases for those decisions. In this way, ethics is concerned with all facets of the human experience — from the individual to the conglomerate. Accordingly, the importance in informing which design choices are best becomes apparent. The issue, of course, then becomes what we define as 'best.' Notions of 'good' can vary wildly based on what we choose to prioritize, and though the prompts may be simple, the answers are far from easy in their contingency. Especially when dealing with an imbalance of power/knowledge [4] regarding marginalized epistemologies.

Any truly ethical deliberation process must account for those power dynamics, hence why an intersectional feminist framework is especially appropriate. A feminist ethics will, by design, by cognizant of the notion of power; especially that concerning epistemology. This is useful as it includes an analysis of both the power imbalances and the invisibility of the exercises of power, which helps in contextualizing the pervasive silencing, absence, difference, and gendered oppression [5] in all its intersecting forms while still remaining conscious of the relationality inherent to any deliberation process.

A feminist perspective can thus be used to great effect as a vehicle of critique for HCI by integrating feminist values within its discourse and allowing for the development of alternative approaches to design theory and practice. Accordingly, there is a growing body of work intent on incorporating feminist concerns within design literature[1]. An excellent example is the work of Shaowen Bardzell, in which she delves into how feminist theories and praxes can apply to HCI theory, methodology, user research, and evaluation [7].

Feminist epistemology also expands on the idea of standpoint. Donna Haraway's concept of 'situated knowledges' has become a key aspect of feminist theory which describes knowledge that is partial and locatable rather than global and transcendent [8]. In this way, Haraway denounces the objectivity/relativism binary that has been detrimental to the feminist project. Objectivity is typically taken as an impartial perspective under the guise of neutrality which begets a power dynamic rooted in the purportedly universal hegemony of maleness and whiteness and gender-normativity [8] that denies the subjective. In the same way, as relativism is denied any averment of objectivity, all standpoints stand as equally constructed and thus annul any pretense of hegemonic objectivity. In contrast with the dominant epistemological tradition, feminist epistemologists tend to focus on the impact of a social locus. Indeed, standpoint theory deals with exactly this [9]. A standpoint in not inherited but achieved, and stems from active political engagement with the feminist cause. "In other words, political participation distinguishes the standpoint from perspective" [10] (p. 2).

2.2 Why it matters

The stark absence of women, queer, trans*[2], intersex and gender-nonconforming people in the design space creates a gendered semiotic imbalance, whereby a dominant normative maleness is more highly valued when compared to any alternative [12]. This contributes further to a design culture which outputs goods and services that do not serve the needs of anyone but the hegemonic default, occasionally even actively incurring in harmful actions [13].

[1] See, for example, Prado de O. Martins, 2014 [6].

[2] Following Jack Halberstam's reasoning, we will be using "trans*" instead of "trans" or any other variant throughout this document. This is meant to highlight the lack of any singular category or definition for a trans identity, arguing further for the boundless fluidity of gender identification [11].

Design, though it has largely been driven by principles of usability, ergonomics, efficiency, or functionality, has not so much been informed by a deeper understanding of ethics, even though they are inherently interconnected [14]. This matters because designing according to any particular value system communicates that one places value on that system. Design is not neutral. It can't ever be. Designs are "things with attitudes," [15] (p. 12) — capable of ethical and political agency — which cannot be divorced from individual as well as collective human values[3] [14]. Design as a whole, under the lens of post-colonial feminist analysis, is heavily biased in favor of a Euro- and androcentric hegemony [17] [18] [6] [19]. This is reflective of the limitations of the design institution, and inevitably influences not just which design is practiced and reproduced, but also the surrounding systems and institutions that are seen as legitimate; and, hence, those we should emulate and aspire to.

All design is political, and profoundly so [10] [20] [21]. As posits Mahmoud Keshavarz, neither can be divorced from the other and should be understood not as separate but as "nexus" — as "design-politics[4]" [21] (p. 93). This, he argues, is in spite of the distinct manner in which they deal with their settings, as, above all, both constitute material formulations which "configure possibilities of acting in a given situation" [21] (p. 93). This, as Keshavarz argues, ought to highlight not how they behave as distinct fields of knowledge and practice but what and how, together, design-politics "produces, performs and generates" — as well as on the weight of this political responsibility [21] (p. 76). Every instance of design, according to Tony Fry, "either serves or subverts the status quo" [20] (p. 88), as it has the potential to generate both stale design towards detrimental hegemonic endurance, or activist design[5] as a catalyst for systemic change [10]. Design activism can be a particularly useful instrument in this regard, as it carries with it unique qualities distinguishing it from strictly political and art activism. "Specifically, the generative nature of design raises the question of how design activists engage in criticizing dominant power relations while at the same time affirming the dominant politics through their design contributions" [10] (p. 2). This becomes especially relevant within the context of HCI — and, indeed, design as a whole. If designed artifacts hold and communicate ethics/politics [14] [15], so too do any potential activist artifacts with transformative potential.

In this way, design holds a lot of sociocultural influence, in both its subtlety and its overtness. As asserts Sanford Kwinter, in addition to Keshavarz [21], the Foucauldian notion of how power wields control over bodies[6] has been evolving to become more indirect [23]. Now, Kwinter argues, that power is increasingly exerted predominantly through the interfaces [23]. This is, of course, of particularly prescient concern for a field such as HCI [7], and, thus, it is vital that we consider the ethics upon which we design these interfaces. Frameworks for ethical decision-making all raise queries with deep political implications. 'Neutral design' is paradoxical; it cannot exist. Some ideology must be presumed because it is always there, regardless of how unintentional [5], because the belief systems therein imbued are not either — our belief systems. See, again, standpoint theory [8] [9]. "Artifacts have politics" [25] (p. 1). That, however, does not mean that designers necessarily recognize themselves as political agents, or even that they recognize the political urgency of design [20]. A neutral design approach is anything but. What it is, instead, is blind to all the intersecting systems of oppression which exist at the margins of hegemony [26] [27] (see Figure 1).

Even with the best of intentions, one can perpetuate these oppressive systems unknowingly, and likewise, also the oppression they communicate. This is the problem with neutral design. It ignores the needs of those whose epistemologies are not valued and thereby produces inadequate solutions biased in favor of hegemonic priorities. Specifically, as it relates to gender parity, we see this kind of gender-neutral approach everywhere, but it is oblivious to the crucial difference between designing equally and designing for equality.

Everything — from datasets to user interfaces to urban spaces — is designed according to, and thus reinforcing, binary, androcentric and cisnormative bodily configurations. Any deviation from that norm is deemed an outlier, and the real people this affects — largely women, queer, trans*, intersex, and gender-nonconforming people — are, in this way, regularly subjected to an increased amount of harm and harassment [28]. Moreover, Racialized People and People with Disabilities are particularly vulnerable to such systematic bias and are often at a higher risk of harm from a system that was not designed with them in mind [26] — one created under a hegemonic set of norms, values, and assumptions which are imbued therein, and subsequently reproduced and unchallenged.

One wouldn't assume that exclusionary things are so by design, but they often are, regardless of intent. Instead, what is most often the cause is even simpler — not even thinking about it in the first place. When we design 'neutral' or 'ideal' systems that use ignorance to set the boundaries of what is relevant, we ineluctably restrict those boundaries to the limits of our own ignorance [29]. This is how the 'ideal neutral' ends up reinforcing and reproducing hegemonic values and assumptions [29]. The failure to consider the full context and implications of these actions, as well as our own role in perpetuating them [5], means that many design actions are being directed not by intentionality, but by a lack of insight [20]. This leads us to an important question: how can we research issues pertaining to power and propose solutions to mitigate oppression

[3]There are numerous ways in which a design, whatever shape it may take, can embody and bespeak the ethical decisions that were made in its conception. See Friedman and Kahn, 2002 [16].

[4]Keshavarz describes his understanding of design-politics as being similar to Foucault's power-knowledge binomial [4], describing it as the origin of the term "nexus" to describe the concept [21]. Thus, according to him, delineating a design-politics is a way of both embodying and describing the numerous ways in which politics and design have historically and materially upheld and strengthened one another [21].

[5]Alastair Fuad-Luke defined design activism as "design thinking, imagination and practice applied knowingly or unknowingly to create a counter-narrative aimed at generating and balancing positive social, institutional, environmental and economic change" (p. 27) [22].

[6]Throughout his work, Foucault dwells a lot on the ways in which external power structures produce subjects; that is, in how regimes of social control exert power — and thus control. In Discipline and Punish, for example, he describes how disciplinary techniques produce "docile bodies" in order to make them more compliant and productive [24]. In History of Sexuality, which immediately followed the latter, Foucault introduced the concept of 'biopower,' which seizes the modern forms of power aimed at living beings by holding them subject to standards of not just sexual but also biological normality [24]. Through these works, one can subsume the larger issue of individual agency. Not only is there an exerted control enacted through other people's knowledge of individuals, but also one exercised in an individual's knowledge of themselves, through these power relations dictated by hegemonic sociocultural institutions.

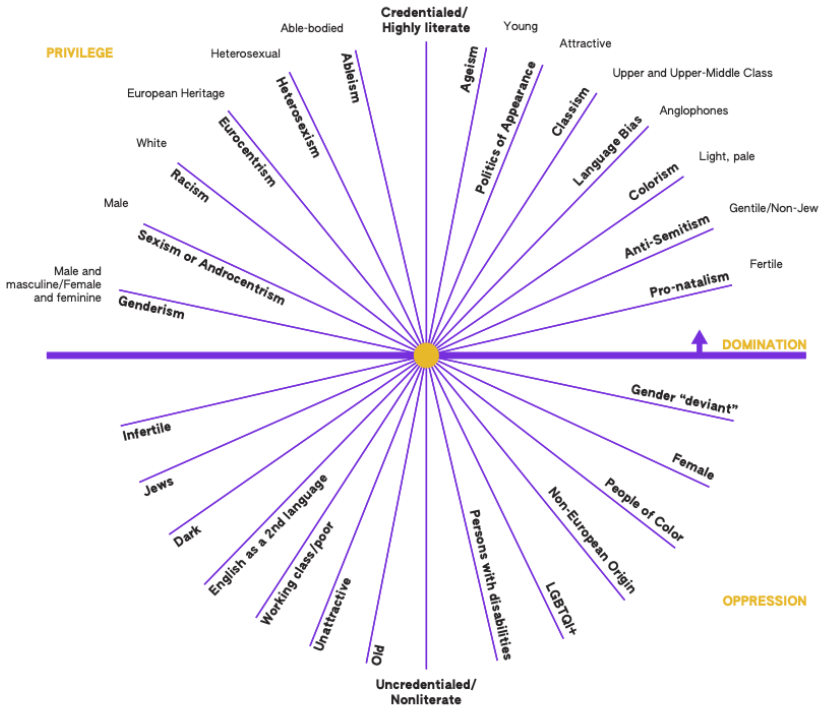

Figure 1: Intersecting axes of privilege, domination, and oppression. Adapted from Morgan, 1996 [27] (p. 107).

when we, as researchers and designers, are complicit in perpetuating these same hegemonic biases? The proposed answer, which the present article hopes to articulate, is that we do so through an explicitly intersectional feminist approach to careful ethical deliberation as an integral part of the design process. From our choice of standpoint [9] to our theoretical bases, to our research design, data collection and data analysis, to the manner in which we present our findings as well as how we act upon them.

3 GENDER-BLIND DESIGN

3.1 The male default

Simone de Beauvoir once wrote that "[r]epresentation of the world, like the world itself, is the work of men; they describe it from their own point of view, which they confuse with absolute truth" [30] (p. 162). Indeed, specifically as it relates to gender, design has historically failed to factor in a sensible and equitable approach within its process, producing designs which overwhelmingly favor a normative male-dominated hegemony in ways that are often invisible to those involved [6] [7] [18] [19] [31]. Numerous products, spaces or services have, inadvertently or not, been designed to favor a 'neutral, average user,' which, as discussed, heavily favors andronormative epistemologies and value systems to the detriment of all that is not deemed valuable or legitimate within them.

In the words of Pierre Bourdieu: "what is essential goes without saying because it comes without saying: the tradition is silent, not least about itself as a tradition" [32] (p. 167). Maleness is presumed — it goes without saying. It does not need to be announced or accommodated for because it is the presumed default for which we are designing [31]. This, however, can have a real impact and concrete consequences in the lives of those who deviate from this norm — those whose identities do not go without saying.

Bardzell contends that gender, because it carries influence through its expression in relationships and identities, does indeed have an effect on how users interact with a designed product or environment [7]. Further, she argues that design should incorporate not only philosophies of gender, but also those of social class, sexuality, race, emotion, or desire [7] — its intersections. This, as discussed above, is necessary so as to confront the hegemonic assumption upon which design is predicated; especially the pervasive idea that there is a universal, or ideal user [7]. Bardzell's work, through a focus on feminist theories and epistemologies, presents us with the concept of a "marginal user" [7] (p. 1302), which she introduces as a counterargument to the inherited conception that there even is a universal one at all. As she propounds, "[a] key feminist strategy is to denaturalize normative conventions, both exposing their constructedness as human discourses situated in sociopolitical institutions and exploring alternative approaches" [7] (p. 1305).

Indeed, from small pockets[7] to large phones[8] to chilling office temperatures[9], gender-biased design and equipment have become infused in every aspect of our lives. Though often invisible to those designing, the ways in which this designed gender disparity permeates our lives go beyond merely annoying to become actively harmful and even potentially life-threatening. Seemingly mundane objects and experiences specifically designed for a normative male user are being deployed as such to a general public without regard for their effects on women, queer, trans*, intersex and gender-nonconforming people.

As an example, VR — an emerging technology in the HCI field which has seen a steady and ever-expanding increase in use and development — largely does not serve women well. In addition to headset rigs being too big, VR platforms have also been shown to cause motion sickness at significantly disparate rates between men and women [37]. Research conducted as to why indicates this is, again, likely an easily preventable design flaw, stemming from the fact that women's interpupillary distance (IPD) tends to be smaller than that of men [37]. IPD, essentially the distance measured between one's eyes, is an important measurement to account for, as a failure to properly adjust one's VR goggles to this distance has been identified as the principal reason for such a gender disparity regarding cyber motion sickness [37]. As such, according to these same findings, something as simple as providing a wider range of IPD adjustability so that not just women but, indeed, all those who do not fall within the accounted-for interval may also attain a good fit, could help in significantly reducing the associated side-effect of cybersickness in general [37].

This failure to account for female and non-normative bodies is prevalent in all aspects of design and, by extension, designed society at large. Another notable instance is that of work clothing. Uniforms tend to come in a very limited range of sizes, which makes work conditions more hostile and potentially even hazardous. The US military, for instance, first began recruiting women for exclusively male combat units in the US Army, the Marine Corps, and the Navy SEALs only in 2016 but failed to prepare proper-fitting military attire [38]. The Army did add eight smaller clothing sizes that year but other important protective equipment such as boots and helmets were neglected. This puts women at an "alarming [disadvantage]," as argues former Democratic Congresswoman Niki Tsongas [38] (para. 10). All military members who do not possess normative male bodies are, thus, being left to find ways to adapt their body armor to fit their frame and protect their organs, even if that means removing protective side panels or adding extra padding to reposition pieces of gear [39]. Further, the baggier uniforms also make it harder for them to fire their weapons efficiently and even effectively [38] [39]. In effect, people are being sent into literal war zones in equipment that was designed exclusively for normative men, which, ultimately, presents an active risk of lethal injury on bodies which deviate from the average male frame.

The erasure and disregard for female and non-normative anatomy and biology are quite prevalent in medical training and research as well [40]. As an example, a 2018 study concluded that, in public locations, men are significantly more likely to receive bystander cardiopulmonary resuscitation (BCPR) when compared to women, which is tied to a 23% increased chance of survival [41]. Though the researchers found that there was no pronounced gender gap when it came to receiving CPR in private locations, they postulate that the data collected suggests that women tend to receive this life-saving technique less often due to a general feeling of discomfort regarding potentially having to touch a woman's breasts [41]. This problem is only exacerbated by the fact that 'standard' mannequins for CPR training are, of course, designed according to an average male anatomy, and do not include breasts [42]. Even the medical term for these such mannequins, Manikin, is quite telling. To try and combat this issue, a group by the name of Womanikin created the first female CPR dummy. The product was designed as an open-source add-on, making it possible for everyone to download the pattern and attach it to any Manikin as an attempt to normalize the administration of life-saving CPR on female bodies [42].

Even the way women use their cars is potentially life-threatening. Compared to men, women tend to sit further forward and more upright. This is because, on average, women have shorter bodies with shorter legs that need to reach the pedals, and shorter torsos that need to see beyond the dashboard [43]. Because of this, the ways in which women sit in the driver's seat present a deviation from the designed-for norm, which is based upon tests conducted with crash dummies typically modeled after the average 50th percentile male body [44]. This places not just women drivers, but also any non-normative bodies in a significantly more vulnerable position, with a 47% greater risk of suffering serious injuries than the average male, and a 71% higher chance of incurring a moderate injury [44].

Either by robbing them of important career opportunities [31] or even by willfully and knowingly placing them at great risk of harm [38] [39] [43] [44], designs that ignore the needs of women, queer, trans*, intersex and gender-nonconforming people are ubiquitous. And it doesn't matter whether this negligence is conscious or not, because the consequences remain very real and potentially very serious. From the annoying to the potentially lethal, we have designed a world in which the average woman is an outlier — to say nothing of trans* and gender-nonconforming identities.

We, quite simply, are not producing designs that work for others as well as normative men. This issue runs deep, down to even the data we collect. The already limited number of urban data sets, coupled with the deep bias in data collecting and processing[10], makes it hard to develop infrastructure programs that factor in marginalized

[7] An investigation conducted by The Pudding recently verified what we all already knew — that clothes marketed to women have significantly smaller pockets than those for men — 48% smaller and 6.5% narrower to be exact [33]. The reason for this impractical annoyance is, of course, anchored in political and historically rooted sexism [34].

[8] Smartphone designs have been steadily increasing in recent years, which can pose as a problem for many women, whose hands are, on average, around 2.5cm smaller than men's [31] [35]. This, evidently, makes these phones harder to use for women or just anyone with smaller hands. Further, these phones can also be harder to store, given the above-mentioned reduced size of pockets in clothing marketed to women [31] [33] [35].

[9] Office temperatures are typically standardized and regulated according to calculations based on an assumed average male body of 40 years of age and 70kg [36]. A study published in Nature, however, recently found that female metabolisms typically run 35% lower than the rate of males under that same calculation [36]. This, on average, results in a preference gap of about 3°C, with women preferring higher temperatures than men [36].

[10] As discussed earlier, seemingly objective automated systems are not neutral. The Algorithmic Justice League collective has produced an expanding body of work documenting the ways in which AI and Machine Learning technologies are intersectionally biased [45].

needs. That said, when appropriate and comprehensive research guided by an ethical impetus to do so is actually conducted, we find that it is indeed possible to design towards gender parity — which, demonstrably, reveals that this is not a question of resources or capability, but rather one of priorities.

Public officials in Vienna, Austria, upon finding that girls' presence in public parks significantly decreased around the age of 10, instead of ignoring the issue, decided to conduct an investigation which resulted in the introduction of a few pilot programs in urban park planning [46]. The results, unsurprisingly, did not indicate that girls, as a group, didn't enjoy parks. Instead, they found that single large open spaces were the problem [46] [47]. This, they concluded, was because these open spaces forced girls to compete with boys for space, and, due to an ingrained patriarchal social conditioning, girls, in general, lacked the confidence to do so [46]. Viennese parks were then divided into smaller sections[11], which saw an increase in girls' attendance[12] [46] [47].

In Malmö, Sweden, public officials found a problem similar to that of Viennese parks [48] [49]. They had set up a space for local youth to engage in activities such as skating, climbing and graffiti, but found that it was almost exclusively boys who were using the space [49]. Luckily, they also decided to investigate and started by asking girls what they wanted. The result was a well-lit space, sectioned into a range of different-sized spaces on different levels [49]. It worked; and, since then, two more spaces targeted specifically at girls have been developed in Malmö with great success [49].

All of these may seem like small changes, but they were successful precisely because they were based on careful examination. It must also be said that even these successful alternatives largely do not account for identities beyond the normative and the binary, and further research is necessary to account for this gap.

But what happens when we are presented with more complex and potentially conflicting ethical quandaries within the deliberation process?

3.2 The bathroom: a case-study

Let us look, then, to bathrooms as a specific case-study of this very problem. Women's bathrooms often have significantly longer lines than those for men [31]. This may seem like a non-issue, and, indeed, the tendency is to simply place the blame on the fact that women just take longer. But, in reality, this is a preventable problem. Specifically, one of flawed design borne out of exactly this inherited hegemony of male-focused design.

At first glance, it may seem fair to provide equal space to both female and male public bathrooms, and this is, in fact, how it has been done historically. This equal division of floor space has even become embedded as a provision in numerous plumbing and sanitation codes [31]. However, if a men's bathroom has both cubicles and urinals, the number of people who can use it at the same time is far greater per square meter of floor space compared to the women's bathroom. And just like that, suddenly, equal floor space is not so equal after all.

But even if male and female bathrooms had an equal number of stalls, the problem still would not disappear. Women take up to 2.3 times longer than men to use the toilet [50]. They also make up the majority of the elderly and disabled, two groups that tend to need more time in the bathroom [31]. Women are also more likely to be providing care for others, such as children or disabled and older people [51]. Then there's also the 20-25% of women of childbearing age who may be on their period and in need of changing a tampon or sanitary pad [31]. Women also tend to require more trips to the bathroom. Pregnancy significantly reduces bladder capacity [31], and women are around 8 times more likely to suffer from urinary tract infections [52].

Considering all of this, it's clear that this 'neutral' approach to supposed equality is woefully inadequate. As such, the natural next step is to ask what the solution to this problem is. On its face, it seems rather obvious — make women's bathrooms bigger and add more stalls. Except this blanket solution is still lacking significant context. Namely, who we are including within the label of womanhood. Jack Halberstam addressed this issue in Female Masculinity [11]. Namely, how the bathroom has become a place for policing gender, both legally and socially. He argues that even having separate bathrooms for different genders is a problem, given that those who do not clearly fall in either category have a very hard time accessing and using public bathrooms without having to deal with harassment of some sort [11]. Indeed, queer- and trans*-exclusionary discourse around bathrooms does very little to nothing at all to improve toilet access for the majority, but it does put trans* and gender-nonconforming individuals at a greater risk of violence when using these spaces [53]. Even further, this also contributes to a dangerous and erroneous homogenization of womanhood.

So, is desegregating bathrooms the answer? Maybe. But it's not so simple. Research has shown that, even though desegregating bathrooms is usually framed as an accommodation for trans* or gender-nonconforming people, average waiting times for women would actually decrease, and those for men would either not be affected at all or would increase only slightly [54]. There are, however, still a few issues to contend with here, and one of the most important is the potential for violence and harassment. And to be clear, research has repeatedly shown that this such violence is overwhelmingly perpetrated by cis men and largely against women, queer, trans*, intersex and gender-nonconforming people, with an even higher propensity associated with racial bias [53] [55]. This is, of course, not to say that all men participate in this behavior, nor that they are the only ones that do. However, the fact that a non-insignificant portion does is something that cannot be ignored, as it would leave women and queer and trans* and racialized and disabled individuals more vulnerable to harassment. Thus, some design strategies[13] would need to be developed to address this issue.

Indeed, there is some research being conducted on this front and some of these strategies could include, for example, the use of open spaces with individual ceiling-to-floor stalls instead of single closed ones [54]. But even with all these seemingly right provisions,

[11] Please refer to [46] (p.205) for an image of the winning plan for the redesign of the Einsiedlerpark in Vienna, Austria, by landscape architects' practice Tilia.

[12] This was also done for Viennese sports facilities for essentially the same reason [46]. Girls weren't using them because boys would tend to aggregate near the only entrance and so they decided to create multiple entrances, instead of just one. They also sectioned these spaces [46].

[13] Bovens and Marconi also discuss strategies aimed at combating the notion that desegregated bathrooms would be uncomfortable or unhygienic [54].

there is still one thing that these gender-desegregated bathrooms could never do, and that is to provide a safe space from external harassment, like bathrooms tend to be, for example in nightclubs [54].

Moreover, this type of solution must be implemented with caution due to this very reason. Places such as India, for example, where access to public sanitation is not as common [51] [56], can lead to increased opportunities for physical and sexual violence against women where this is already a widespread issue [56]. Thus, in regard to this particular discussion, this type of bathroom configuration could aggravate an already serious problem.

3.3 So, what can we do about it

Sometimes we can point to a simple solution for a simple problem; but people are far from simple, and the needs of so-called 'marginal users' vary wildly in their contingency. Indeed, to understand the marginal user as a uniform block that stands alone in contrast to the hegemonic default represents a failure to appreciate the depth of the human experience. No group stands as a uniformized block with the same problems requiring the same solutions. Solutions are, in fact, rarely simple, because what they are addressing is the complexity of the human being — every one of them with "a number of intertwined responsibilities and each of them [as] personal and intransferable as a joy or a grief" [57] (p. 69).

Default measures will always ignore the needs of some, and often of those with the least political agency. Because design has such a significant role in shaping society and culture, for design to become an agent of political change, as writes Tony Fry, "it is vital that the problems be fully understood and proposed actions have actual transformative capability" [20] (p. 88). It is, thus, essential to incorporate ethics as a deliberate and a priori step within the design process — ethics which, by definition, cannot be exclusionary and must center marginalized epistemologies such as feminist, queer, and post-colonial methodologies in the basal steps of the design process [6] [7] [58].

Failing to produce designs which accommodate women, queer, trans*, intersex and gender-nonconforming people — all of us — communicates that we are not welcome to engage with these products, experiences, services, or spaces, and ultimately reproduces gendered oppression by and through design. To this point, Prado, building on Bardzell's writings and drawing from Kimberlé Crenshaw's seminal work on intersectionality [26], argues for a framework for feminist design which is a necessarily intersectional process [6]. This, she asserts, is needed in order to challenge the current design paradigm as one which reproduces gendered oppression through designed objects and environments [6]. Further, Prado, like Bardzell, also identifies a number of feminist matters that design must incorporate; however, she anchors her contention on the issue of privilege, which she identifies as pervasive in the design space — design being the product of a "patriarchal, classist and racist society" [6] (p. 5). This awareness is imperative and, as such, an essential aspect of the deliberative process. Hence, she advocates for the integration of marginalized epistemologies as an ethic unto itself, by "[challenging] observers to question their own roles in maintaining social injustice" [6] (p. 8).

4 THE MODEL

4.1 Foundations

Ruth Levitas describes a structure for societal reconstitution[14] in three separate yet reciprocal modes. They are the archaeological mode, a way of connecting concepts and images within political programs and social and economic policies; the ontological mode, a way of addressing and challenging the values and epistemologies which permeate a particular society; and the architectural mode, the ability to conceive of alternatives [59].

Building on all this, we propose a multidimensional model for an ethically conscious design process (see Figure 2) which recognizes the need for a multi-pronged approach and accounts for an intersectional feminist ethics being an inextricable aspect thereto. In this way, a design process that is conscious of all these intersecting issues cannot simply be a sequence of steps but must become a holistic endeavor. There can be no ordered hierarchy, only equal parts of the same whole.

Epistemological starting points

▼ Ethical quandaries permeate the design process and are, in fact, inextricable for it [14] — hence why the designer must act as an ethical agent.

▼ A lack of ideological intent will merely perpetuate existing power structures [20] [29] which fuel oppressive hegemony.

▼ Power dynamics are properly considered and accounted for. It is especially important to consider those pertaining to the "legitimacy" of marginal ways of knowing and being as the power/knowledge binomial [4] is proven to constitute a significant channel for the perpetuity of systemic oppression [60].

▼ The hierarchical structuring of knowledge is known to perpetuate inequality and power imbalances which breed relations of domination [5] [12]. As such, local contexts must be treated as not merely useful but in the same high regard as supposed expert knowledge. This includes, by design, an elevation of specifically intersectional feminist issues [34].

▼ Because a stance anchored in neutrality will only propagate gendered oppression [2], a specifically gender-conscious approach which takes into account the lived experiences of all women, queer, trans*, intersex and gender-nonconforming people is far more germane to design solutions which aim for transformative agency.

▼ Within each space or group, divergences among people, particularly those related to gender, sexuality, class, race, ability, and others [26] [27], must be observed. This multitude of perspectives should be welcomed and regarded as a potential source of creativity and information.

▼ Women, queer, trans*, intersex and gender-nonconforming people's contributions are respected and incorporated as significant contributions while taking care to not construct us as idealized morally righteous martyrs who hold all the solutions as this carries the propensity for restricting marginalized identities to subordinate positions [61].

Research process

▼ Feminist research ethic:

[14] It should be remarked that Levitas's work is largely focused on utopia [59]. Though it falls beyond the purview of this article, it could be argued that the utopian project is very closely aligned with that described herein.

A feminist research ethic will, by definition, be conscious of the power dynamics inherent to the research process and, as such, it is more likely that the application of explicitly intersectional feminist frameworks will result in work that has "actual transformative capability" [20] (p. 88). Feminist standpoints [9] redirect our focus away from traditional queries that originate stale work that is either ignorant of the needs of women, queer, trans*, intersex and gender-nonconforming people or actively harms us. Instead, it is able to ask questions that have not historically been explored within the purview of HCI or even design as a whole. A well-established feminist research ethic can also increase our confidence in the tools we develop for our projects, and thereby increase the quality of our research. It is, after all, our collective responsibility as ethical agents to assert our commitment to self-reflection and our observance of the power/knowledge [4] dynamics as we make sure that subjective experiences are considered positively [8] [9] while acknowledging that "neither the subjectivity of the researcher nor the subjectivity of the researched can be eliminated in the (research) process" [62] (p. 427).

▼ Ethical Parallel Research:

Since ethical consideration within the design space is fairly new [63], we, as designers and HCI scholars, would do well to learn from more experienced fields. An especially interesting approach is that of Ethical Parallel Research, originally described within the bioethics purview. This is proposed as a method for attempting to identify and evaluate which ethical consequences will derive from a given piece of technology — positive and negative — within the development process. That is, before the damage is done. Toward that goal, Jongsma and Bredenoord identify six pillars of ethics parallel research [64]. The first, disentangling wicked problems, is meant to facilitate an understanding of disparate stakeholder needs by scrutinizing all the diverging viewpoints and clarifying their concerns in order to ascertain whether there are significant gaps in knowledge or any underrepresented standpoint. The second, upstream or midstream ethical analysis, is focused on ethical analysis in the earliest stages of development. This is done to reflect on the permeating, perhaps unconscious hegemonic assumptions when it is not yet too late and, thus, help guide the remainder of the development process. The third, ethics from within, incorporates experts in various fields pertaining to the technology under study so as to properly understand it and subsequently be able to identify its implications. The fourth, empirical research, argues that interaction with affected communities is essential to grasp their perspectives as well as what effects something can have in practice. The fifth, participatory design, seeks the collaboration of societal actors in the development of new projects and technologies. The sixth and final, societal impacts, argues for the consideration of 'soft impacts' like our values, autonomy or identity as also relevant alongside more easily quantifiable 'hard impacts' such as cost and risk.

▼ Planning:

A comprehensive planning stage is exceptionally important and should be recontextualized as a socially constructed political process [65]. Given its inherent association with the values and epistemologies of all involved parties, planning processes, much like design, are not neutral but heavily ideologically based [66]. The issue is not merely that men tend to outnumber women, queer, trans*, intersex and gender-nonconforming people in planning stages, but also the hegemony of normative male perspectives within underlying theories, ideologies, and cultures [67]. There is, hence, a clear necessity for redesigning effective planning stages from an intersectional feminist standpoint in ways that are historically, contextually, and methodologically appropriate [68]. Collaborative and participatory research models should, likewise, be planned around the empowerment of women, queer, trans*, intersex and gender-nonconforming people by accounting for needs such as safe spaces and childcare [65] to allow participation and foster collaborative exchanges among community members built upon mutual respect, active listening, and an earnest willingness to learn [69].

Collaborative tools

▼ Community participation:

An informed ethical deliberation requires a transversal approach to community participation specifically built around emancipatory action-oriented theories and methodologies under an intersectional feminist perspective. There is, nonetheless, a number of obstacles to the unmarred involvement of women within participatory engagements, even when a gender-conscious standpoint is assumed [65] [70]. Indeed, the consultation of communities has typically been modelled after adversarial modes of interaction which are more often alienating to women, queer, trans*, intersex and gender-nonconforming people [65]. This, combined with the historical exclusion of these groups for a perceived and unfounded lack of the technical skills, legitimate knowledge, and expertise required for agendas centered around a hegemonic normative maleness. Strategies must, then, be developed and adopted which consciously address these issues and empower marginalized voices and perspectives. Indeed, "the attempt to address gender issues head-on is what distinguishes the more successful projects from those which merely pay lip service to women before submerging them in some amorphous framework of community needs" [71] (p. 29). Working closely with community organizers and social justice advocates within any given context is also an important step [72]. Additionally, the establishment of women-only activities has been shown to be helpful in discussions of issues pertaining to communication technologies [73] and this could also be extrapolated for other marginalized groups through "two-dimensional visual representations, physical objects, spatial forms, interactive workshops, affective interfaces, and embodied experiences" [10] (p. 4).

▼ (Counter)storytelling:

Methods of design research anchored in design exploration often include practices of fictionalization such as speculative design, design fiction and scenario building [10] in an attempt to provide alternatives to established design narratives. Teresa de Lauretis even described the (re)telling of stories as a key aspect of feminist work as a method of "[inscribing] into the picture of reality characters and events and resolutions that were previously invisible, untold, unspoken (and so unthinkable, unimaginable, 'impossible')" [74] (p. 11). Empowering women [67] to share their stories and experiences can, in this way, lead to increased awareness and involvement with the research process [65], in addition to providing a valuable source of local knowledge. Counterstorytelling specifically, as a methodology rooted in Critical Race Theory, is set to create opportunities for both personal development and hegemonic resistance, and has been directly tied with an increased general understanding of intersectional queer, trans*, intersex and gender-nonconforming identities

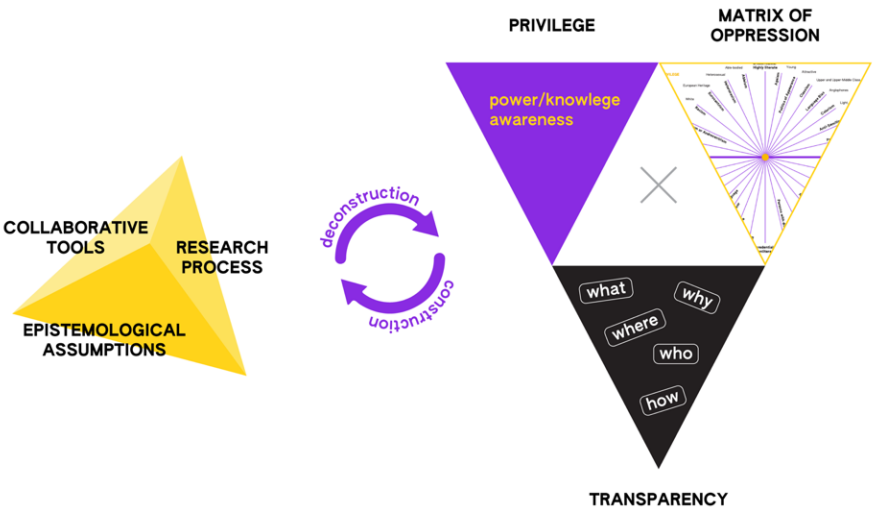

Figure 2: The proposed model for an ethically conscious and multidimensional design process.

[75]. "Truly listening to others entails moving outside your own conceptual frameworks, especially the binary thought structures and patriarchal character of most Western knowledge" [76] (p. 239). The establishment of avenues for people to share knowledge and recontextualize it within hegemonic narratives is crucial in the process of finding the power to create and challenge designs, systems, and institutions that impact them [75]. These alternative stories are, in this way, able to challenge the dominant narratives, ideologies, and socio-political structures [8] incurring in harmful design actions through an activist practice [10].

▼ Design activism:

Design activism, as described earlier, is plural in its presentation and thus a highly adaptable vehicle for enacting transformative change. From products and systems to personal everyday things and public institutions, design activism is capable of idealizing new systems as well as social and political practices through spaces of designerly interventions. They act back and "[integrate] both political statements and human emotions and increases factual and empathic awareness to alter status quo" [10] (p. 3). A feminist approach to design activism is, likewise, such that elevates the subjective and values embodied experiences as a source of legitimate actionable knowledge [10] while being cognizant of our own biases. As argues Lucy Suchman, simply boosting the visibility of marginalized groups is not enough. Instead, we must be integrated as co-creators of the design solutions that affect us [76].

4.2 Structure

Devoid of any form of sequential hierarchy, the model (see Figure 2) is built around the (de)construction of a three-dimensional equilateral triangular pyramid as a metaphor for the endeavor herein described. The planar structure was also rotated to present as an inverted triangle as an ever-present semiotic reference to the necessity of feminist epistemologies for ethical deliberation. Further, its cyclical representation symbolizes that the edifice of construction will necessarily require a deconstruction of our own biases and those that permeate our environments, guided by the express intention to create something transformative — to construct.

The depicted pyramid is the same on each side — representing a holistic approach — but is depicted in two ways. The three-dimensional presentation embodies acts of construction and the planar representation those of deconstruction. Another relevant aspect is that the pyramid lacks a base. This is done intentionally to illustrate that this base must always be contextually (re)filled. Additionally, the lack of a base reflexively means that each side of the pyramid stands on its own without any hierarchical distinctions. An understanding of the context in which one designs, how one designs, and the choices one makes is imperative in producing design which does not incur in harmful reproduction of biased hegemonic values, and thus can be neither graded nor separated.

Paradoxes and contradictions will likely be inevitable; however, when deconstructed and understood, they too can be a tool for challenging the dominant hegemony when constructing transformative design solutions. Toward that end, a thorough deconstruction of the matrix of oppression [27] through an analysis of power/knowledge [4] dynamics with a commitment to transparency is key. The privilege of which Prado [6] speaks, in this way, acts like a form of blinding hubris — the kind that allows us to believe we can devise a single perfect solution for a universal neutral user. We cannot. The proposed model is, likewise, intent on providing a theoretical basis so that we may find inclusionary solutions that work in a given context while at the same time understanding that they will seldom be replicable because these contingent realities will necessarily diverge (as illustrated by the baseless pyramid). And what these might look like might vary wildly depending on: what is the objective — is there a specific political/ethical intent; who are we and who are we designing for — disclose personal biases and understand the expressed needs of the public by involving them as co-creators; why are we doing this — is it transformative; where are we designing — do we understand the context within which we are designing; and how are we doing it — is the methodology appropriate.

5 CHALLENGES AND FUTURE WORK

The proposed model for an explicitly feminist ethical deliberation process should be treated as a first draft, rather than a set experiment. The hope is that this might provide a good starting point for discussion and further research, but future work is certainly required to help disentangle these intricacies.

Indeed, feminist frameworks can make empirical studies somewhat challenging, as feminist theory is rooted in revealing the underlying politics in every step of the research process [65]. There is, by definition, no singular correct way of being feminist, which creates additional degrees of complexity associated with this type of research and, thus, also poses some implicit limitations to any subsequent praxis. These limitations will likely be of two interrelated natures. On one hand, the pluralism within marginalized epistemologies, rooted in the recognition of anti-hegemonic alternatives, albeit inevitable and necessary, even hopeful, displays no clear path forward. On the other, that very quality displays an often-overwhelming array of possibilities that can come across as too overwhelming to begin narrowing down.

Further, in dealing with these marginalized epistemologies, there is an inherent deficit in visibility, which tends to be followed by higher levels of scrutiny. If something fails or originates unintended consequences, the temptation for the scientific community to argue that it would have never succeeded will be greater. And because there is such underwhelming representation, much more accountability will be demanded for projects of this nature, which might lead to less scrutinized proposals anchored in the hegemonic tradition gaining ground and mitigating the visibility of any alternatives. That, of course, places an undue burden on ideation and subsequent creation, which is something to be overcome. But that it is challenging does not make it any less important.

Many different experiments and tests have been left for the future to keep building on this proposal. Future work should concern deeper analysis of particular mechanisms, new proposals, and variations on methodology for a number of different projects and contexts. This is necessary to develop a better grasp of what works in a given context and what doesn't, and also so that, eventually, we might be able to accurately map this out.

Therefore, future research should be conducted in realistic applied settings. Our next step will be to apply this model with the students of the University of Lisbon's Faculty of Architecture + Faculty of Fine Arts Master's in Interaction Design. This is so that we have easier access to a broad sample size and has the added bonus of integrating students into this research — students who not only crave ethics-oriented teaching but also will, at such a formative stage, benefit the most from it [77]. Looking forward, next steps should entail a paradigmatic shift in the development of alternative value systems that perpetuate gendered oppression by design. Moreover, we believe that further similar studies in a plurality of different settings could prove quite beneficial to HCI literature as well as, potentially, policymaking and regulation of technological development.

6 CONCLUSION

A design approach intended to be predicated on 'neutral' or 'ideal' systems will always fail to see beyond the designers' own experience in relation to the hegemonic paradigm. This is why an approach that centers on an explicitly intersectional feminist framework for ethical deliberation as an integral part of the design process is so important. If we don't question the values, intentions, and outcomes which underlie the design choices we make, we are failing to act as ethical agents, and become complicit in a design which perpetuates and communicates oppression.

Ethics isn't optional. It's already part of the design process, whether implicit or explicit. Ethical implications abound in the design choices we decide to make. The problem is that we are largely not considering them when it matters — before the damage is done. Our interactions with the world, the way we perceive it, the way we perceive others, and even ourselves; are mediated by a design that is decidedly not neutral. It always embodies and communicates meaning, either with our knowledge and consent, or with our ignorance and negligence.

As designers, we are accountable to the public for whom we design; and, as such, we must act with the owed responsibility. A responsibility to include, rather than exclude. Designing for equality — for accessibility as well as usability — requires transformative political intent. So we see, then, that designing toward gender parity cannot be oblivious to intersecting issues of gender. Any approach that is not thorough in its intentionality will merely reinforce solutions that are exclusionary and communicate oppression in ways that we are blind to. This is why, rather than a gender-blind approach to design, what is required instead is one that is specifically gender-conscious — aware of these issues in all their intersecting forms. It is our collective responsibility as HCI researchers and designers to reinforce our commitment to the observance of power/knowledge dynamics, as well as our own complicity in perpetuating hegemonic epistemologies. The proposed model is a way for us to integrate this kind of feminist ethical deliberation within the design process, which, hopefully, can positively contribute to HCI literature in this regard.

Designing for gender parity is not a matter of resources or capability; it's a question of priorities. And, as it stands, we simply are not prioritizing women, queer, trans*, intersex, or gender-nonconforming people. Ethical deliberation matters. Our choices, matter. Especially the ones we don't make.

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REFERENCES

[1] Manzini, Ezio. 2015. Design, When Everybody Designs: An Introduction to Design for Social Innovation. The MIT Press. Cambridge, MA.
[2] Canlı, Ece. 2017. Queerying Design: Material Re-configurations of Body Politics. Ph.D Thesis. University of Porto.
[3] Simon, H., 1996. The Sciences of the Artificial. MIT Press, Boston, MA.

[4] Foucault, Michel. 1980. Power/Knowledge: Selected interviews and other writings 1972-1977. (C. Gordon, Ed.). Vintage Books. London.

[5] Ackerly, Brooke and True, Jacqui. 2008. Reflexivity in Practice: Power and Ethics in Feminist Research on International Relations. International Studies Review, 10(4), 693-707. http://www.jstor.org/stable/25482017

[6] Prado de O. Martins, Luiza. 2014. Privilege and Oppression: Towards a Feminist Speculative Design. In Lim, Y., Niedderer, K., Redström, J., Stolterman, E. and Valtonen, A. (Eds.), Design's Big Debates - DRS International Conference 2014, Umeå: DRS, 16-19.

[7] Bardzell, Shaowen. 2010. Feminist HCI: taking stock and outlining an agenda for design. Proceedings of the 28th international conference on Human factors in computing systems - CHI '10, 1301-1310. http://dx.doi.org/10.1145/1753326.1753521.

[8] Haraway, Donna. 1988. Situated Knowledges: The Science Questioning Feminism and the Privilege of Partial Perspective. Feminist Studies, 14(3), 575-599. https://doi.org/10.2307/3178066.

[9] Harding, Sandra. 1991. Whose science? Whose knowledge?: Thinking from women's lives. Cornell University Press. Ithaca, NY

[10] Heidaripour, Maryam and Forlano, Laura. 2018. Formgiving to Feminist Futures as Design Activism. In Storni, C., Leahy, K., McMahon, M., Lloyd, P. and Bohemia, E. (eds.), Design as a catalyst for change - DRS International Conference 2018, 25-28 June, Limerick, Ireland. https://doi.org/10.21606/drs.2018.464

[11] Halberstam, Jack. 1998. Female Masculinity. Duke University Press. London.

[12] Ehrnberger, Karin, Räsänen, Minna, and Ilstedt, Sara. 2012. Visualising gender norms in design: Meet the mega hurricane mixer and the drill dolphia. International Journal of Design, 6(3), 85-98. http://www.ijdesign.org/index.php/IJDesign/article/view/1070/531.

[13] Churchill, Elizabeth. 2010. Sugared puppy-dog tails. Interactions, 17(2), 52-56. https://doi.org/10.1145/1699775.1699787.

[14] Verbeek Peter. 2008. Morality in Design: Design Ethics and the Morality of Technological Artifacts. In Kroes, P., Vermaas, P. E., Light, A. and Moore, S. A. (Eds.), Philosophy and Design: From Engineering to Architecture. Springer. Dordrecht.

[15] Attfield, Judy. 2000. Wild Things: The Material Culture of Everyday Life. Bloomsbury Publishing. London.

[16] Friedman, Batya and Kahn, Peter. 2002. Human values, ethics, and design. The human-computer interaction handbook: fundamentals, evolving technologies and emerging applications. L. Erlbaum Associates Inc. USA, 1177-1201.

[17] Ansari, Ahmed. 2018. What a Decolonisation of Design Involves: Two Programmes for Emancipation. Decolonising Design. Retrieved August 2, 2021 from https://www.decolonisingdesign.com/actions-and-interventions/publications/2018/what-a-decolonisation-of-design-involves-by-ahmed-ansari/

[18] Scotford, Martha. 1994. Messy History vs. Neat History: Toward an Expanded View of Women in Graphic Design, Visible Language, 28(4), 368-388.

[19] Bretteville, Sheila. 1974. A reexamination of some aspects of the design arts from the perspective of a woman designer. In: Kamarck, E. (Ed.), Arts in society: women and the arts, volume 11(1), University of Wisconsin, Madison, WI, 114-123.

[20] Fry, Tony. 2007. Book review: The Archeworks Papers, Design Issues, 23(3), 88-92.

[21] Keshavarz, Mahmoud. 2016. Design-Politics: An Inquiry into Passports, Camps and Borders. Ph.D Thesis. Malmö University, Faculty of Culture and Society.

[22] Fuad-Luke, Alastair. 2009. Design Activism: Beautiful Strangeness for a Sustainable World. Routledge. London.

[23] Kwinter, Sanford. 2001. Architectures of Time: Toward a Theory of the Event in Modernist Culture. The MIT Press. Cambridge, MA.

[24] Gutting, Gary (Ed.). 2005. The Cambridge Companion to Foucault. Cambridge University Press. Cambridge, MA.

[25] Winner, Langdon. 1980. Do Artifacts Have Politics?, Daedalus, 109(1), 121-136. https://www.jstor.org/stable/20024652.

[26] Crenshaw, Kimberle. 1989. Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. In Bartlett, K. and Kennedy, R. (Eds.), Feminist Legal Theory. Routledge, New York, NY, pp.57-80. http://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8.

[27] Morgan, Kathryn. 1996. Describing the Emperor's New Clothes: Three Myths of Educational (In-)Equity. In Diller, A., Houston, B., Morgan, K. P., Ayim, M. (Eds.), The Gender Question in Education. Routledge. New York, NY. 105-123.

[28] Costanza-Chock, Sasha. 2018. Design Justice, A.I., and Escape from the Matrix of Domination. Journal of Design and Science.

[29] Alcoff, Linda. 2007. Epistemologies of ignorance: Three types. In Sullivan, S. and Tuana, N. (Eds.) Race and Epistemologies of Ignorance. State University of New York Press. New York, NY.

[30] Beauvoir, Simone. 1953 [1949].The Second Sex, (Parshley, H. M. Trans.). Jonathan Cape. London.

[31] Perez, Caroline. 2019. Invisible Women: Exposing Data Bias in a World Designed for Men. Abrams Press. New York, NY.

[32] Bourdieu, Pierre. 1977 [1972].Outline of a Theory of Practice, (Nice, R. Trans.). Cambridge University Press. Cambridge, MA.

[33] Diehm, Jan and Thomas, Amber. 2018. Women's Pockets are Inferior. The Pudding. Retrieved August 4, 2021 from https://pudding.cool/2018/08/pockets/

[34] Summers, Chelsea. 2016. The Sexist, Political History of Pockets. Vox. Retrieved August 3, 2021 from https://www.vox.com/2016/9/19/12865560/politics-of-pockets-suffragettes-women

[35] Petter, Olivia. 2018. Apple has been criticised by women for making phones that are 'too big' to fit in their hands. The Independent. Retrieved August 4, 2021 from https://www.independent.co.uk/life-style/women/apple-iphone-xs-max-new-too-big-size-women-sexist-feminist-a8537171.html

[36] Kingma, Boris and van Marken Lichtenbelt, Wouter. 2015. Energy consumption in buildings and female thermal demand. Nature Climate Change, 5(12), 1054-1056. https://doi.org/10.1038/nclimate2741.

[37] Stanney, Kay, Fidopiastis, Cali, Foster, Linda. 2020. Virtual Reality Is Sexist: But It Does Not Have to Be. Frontiers in robotics and AI, 7(4), 1-19. https://doi.org/10.3389/frobt.2020.00004.

[38] Tritten, Travis. 2016. Form-Fitted Body Armor Rolling Out as Combat Roles Expand for Women. Retrieved August 1, 2021 from https://www.military.com/daily-news/2016/03/04/form-fitted-body-armor-rolling-out-combat-roles-expand-women.html

[39] O'Connor, Ema and Bergengruen, Vera. 2019. Military Doctors Told Them It Was Just 'Female Problems.' Weeks Later, They Were In The Hospital. Retrieved August 1, 2021 from https://www.buzzfeednews.com/article/emaoconnor/woman-military-doctors-female-problems-health-care

[40] Hamberg, Katarina. 2008. Gender Bias in Medicine. Women's Health, 4(3), 237-243. https://doi.org/10.2217/17455057.4.3.237.

[41] Blewer, Audrey, McGovern, Shaun, Schmicker, Robert, May, Susanne, Morrison, Laurie, Aufderheide, Tom, Daya, Mohamud, Idris, Ahamed, Callaway, Clifton, Kudenchuk, Peter, Vilke, Gary and Abella, Benjamin. 2018. Gender Disparities Among Adult Recipients of Bystander Cardiopulmonary Resuscitation in the Public, Circulation. Cardiovascular Quality and Outcomes, 11(8). https://doi.org/10.1161/circoutcomes.118.004710

[42] Womanikin. 2019. Womanikin. Retrieved July 25, 2021 from https://womanikin.org/

[43] Shaver, Katherine. 2012. Female dummy makes her mark on male-dominated crash tests. The Washington Post. Retrieved July 26, 2021 from https://www.washingtonpost.com/local/trafficandcommuting/female-dummy-makes-her-mark-on-male-dominated-crash-tests/2012/03/07/gIQANBLjaS_story.html?utm_term$=$.5ec23738142a

[44] Bose, Dipan, Segui-Gomez, Maria, Crandall, Jeff. 2011. Vulnerability of female drivers involved in motor vehicle crashes: an analysis of US population at risk. American journal of public health, 101(12), 2368-2373. https://doi.org/10.2105/ajph.2011.300275.

[45] Buolamwini, Joy and Gebru, Timnit. 2018. Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification, Proceedings of the 1st Conference on Fairness, Accountability and Transparency, PMLR(81), 77-91. https://proceedings.mlr.press/v81/buolamwini18a.html.

[46] Irschik, Elisabeth and Kail, Eva. 2013. Vienna: Progress Towards a Fair Shared City. In Madariaga, I. and Roberts, M. (Eds.), Fair Shared Cities: The Impact of Gender Planning in Europe. Routeledge. London. 193-230.

[47] Sidorova, Milota. 2017. More Girls To Parks! Case Study of Einsiedler Park, Vienna. WPS Prague. Retrieved August 4, 2021 from http://www.wpsprague.com/research-1/2017/1/6/more-girls-to-parks-case-study-of-einsiedler-park-viennamilota-sidorova

[48] European Charter for Equality of Women and Men in Local Life, 2013. Urban planning on girls conditions. Charter-equality.eu. Retrieved August 4, 2021 from https://charter-equality.eu/exemple-de-bonnes-pratiques/urban-planning-on-girls-conditions.html?ref_id$=$166

[49] CIVITAS. 2020. Smart choices for cities — Gender equality and mobility: mind the gap!. civitas.eu. Retrieved August 5, 2021 from https://civitas.eu/sites/default/files/civ_pol-an2_m_web.pdf

[50] Banks, Taunya. 1991. Toilets as a Feminist Issue: A True Story, Berkeley Women's Law Journal, 6(2), 263-289. https://digitalcommons.law.umaryland.edu/fac_pubs/334.

[51] Greed, Clara. 2014. Global gendered toilet provision. AAG Annual Conference. Tampa, FL, USA. http://eprints.uwe.ac.uk/24058.

[52] Al-Badr, Ahmed and Al-Shaikh, Ghadeer. 2013. Recurrent Urinary Tract Infections Management in Women: A review. Sultan Qaboos University medical journal, 13(3), 359-367. https://doi.org/10.12816%2F0003256.

[53] Jones, Charlotte and Slater, Jen. 2020. The toilet debate: Stalling trans possibilities and defending 'women's protected spaces'. The Sociological Review, 68(4), 834-851. https://doi.org/10.1177/0038026120934697.

[54] Bovens, Luc and Marcoci, Alexandru. 2020. The gender-neutral bathroom: A new frame and some nudges. Behavioural Public Policy, 1-24. https://doi.org/10.1017/bpp.2020.23.

[55] Council of Europe. 2007. Gender Matters: A Manual on Addressing Gender-based Violence Affecting Young People. In Council of Europe, Gender Matters: A Manual on Addressing Gender-based Violence Affecting Young People. Council of Europe, 43-66.

[56] Anand, Anu. 2014. Lack of toilets puts India's health and rural women's safety at risk. The Guardian. Retrieved August 4, 2021 from https://www.theguardian.com/global-development/2014/aug/28/toilets-india-health-rural-women-safety
[57] Bunge, Mario. 1975. Towards a Technoethics. Philosophic Exchange, 6(1), 69-79. https://doi.org/10.5840/monist197760134.
[58] Borning, Alan and Muller, Michael. 2012. Next steps for value sensitive design. Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems - CHI '12, 1125-1134.
[59] Levitas, Ruth. 2013. Utopia as Method: The Imaginary Reconstitution of Society. Palgrave Macmillan. New York, NY.
[60] Weedon, Chris. 1987. Feminist practice and poststructuralist theory. Blackwell. Cambridge, MA.
[61] Lennie, June. 1996. Gender and power in Sustainable Development Planning: Towards a feminist poststructuralist framework of participation. Master Thesis. Queensland University of Technology.
[62] Acker, Joan, Barry, Kate and Esseveld, Joke. 1983. Objectivity and truth: Problems in doing feminist research ☆. Womens Studies International Forum, 6, 423-435. https://doi.org/10.1016/0277-5395(83)90035-3.
[63] Henriksen, Danah. 2016. The role of theory in Design: Reflections on 'Examining practical, everyday theory use in design research'. She Ji: The Journal of Design, Economics, and Innovation, 2(2), 141-143. https://doi.org/10.1016/j.sheji.2016.12.005.
[64] Jongsma, Karin and Bredenoord, Annelien. 2020. Ethics parallel research: an approach for (early) ethical guidance of biomedical innovation. BMC Med Ethics 21(81). https://doi.org/10.1186/s12910-020-00524-z
[65] Lennie, June. 1999. Deconstructing gendered power relations in participatory planning. Women's Studies International Forum, 22(1), 97-112. https://doi.org/10.1016/s0277-5395(98)00098-3.
[66] Kerkin, Kate and Huxley, Margo. 1993. Training women planners or educating feminist urbanists. Women and Planning: A National Conference. Urban Futures Journal, 3(3), 33-38.
[67] Sandercock, Leonie and Forsyth, Ann. 1992. A gender agenda: New directions for planning theory. Journal of the American Planning Association, 58(1), 49-59. https://doi.org/10.1080/01944369208975534.
[68] Steeves, H. Leslie. 1993. Creating imagined communities: Development communication and the challenge of feminism. Journal of Communication, 43(3), 218-229. https://doi.org/10.1111/j.1460-2466.1993.tb01295.x.
[69] Daley, John and Angulo, Julio. 1990. People-centered community planning. Community Development Society. Journal, 21(2), 88-103. https://doi.org/10.1080/15575339009489963.
[70] Parpart, Jane. 1995. Deconstructing the development "expert". Gender, development and the "vulnerable groups". In Marchand, M. and Parpart, J. (Eds.), Feminism/ Postmodernism/ Development. Routledge. London, 221-243.
[71] Peel, Mark. 1993. Who speaks, who gets heard? Women and planning in poor suburbs. Women and Planning: A National Conference, Urban Futures Journal, 3(3), 27-30.
[72] Costanza-Chock, Sasha. 2020. Design Justice: Community-led practices to build the worlds we need. The MIT Press. Cambridge, MA.
[73] Bruce, Margaret and Adam, Alison. 1989. Expert systems and women's lives: A technology assessment. Futures, 21, 480-497. https://doi.org/10.1016/0016-3287(89)90087-6.
[74] de Lauretis, Teresa. 1986. Feminist Studies. Critical Studies. Indiana University Press. Bloomington, IN.
[75] Wagaman, M. Alex, Obejero, Rae and Gregory, James. 2018. Countering the Norm, (Re)authoring Our Lives: The Promise Counterstorytelling Holds as a Research Methodology With LGBTQ Youth and Beyond. International Journal of Qualitative Methods, 17(1). https://doi.org/10.1177/1609406918800646.
[76] Suchman, Lucy. 2002. Located accountabilities in technology production. Scandinavian Journal of Information Systems: Vol. 14: Iss. 2, Article 7. https://aisel.aisnet.org/sjis/vol14/iss2/7
[77] Nini, Paul. 2020. Threading Ethics in a Design Curriculum. In Scherling, L. and DeRosa, A. (Eds.), Ethics in Design and Communication: Critical Perspectives. Bloomsbury. London, 206-215.