



Imagining with the Body: Speculative Designs for Women’s Embodied Empowerment in Feminist Self-Defense

Bojana Nikolovska
Department of Informatics and Media
Uppsala University
Uppsala, Sweden
b.b.nikolovska@gmail.com

Maria Normark
Department of Informatics and Media
Uppsala University
Uppsala, Sweden
maria.normark@im.uu.se

Helga Sadowski
Department of Informatics and Media
Uppsala University
Uppsala, Sweden
helga.sadowski@im.uu.se

Abstract

Feminist self-defense combines physical self-defense with mental strength exercises through role-playing scenarios. It aims to challenge limiting beliefs about women’s abilities to respond to interpersonal violence. We present the experiences from feminist self-defense classes in Sweden and the results of a set of speculative designs that combined contribute to imagine how technology could play a role in experiencing these holistic practices. The goal is to illustrate the potential of embodied interaction design to empower beginner feminist self-defense practitioners. To do so, the study was conducted via two methods: semi-structured interviews with students and teachers, and a participatory speculative design workshop with novice practitioners. The speculative concepts demonstrate how design can support the practice of feminist self-defense. Through this study we contribute to the corpus of embodied design interventions, in this case combining design for bodily movements with feminist consciousness raising in relation to the topic of gender-based violence.

CCS Concepts

• Human-centered computing; • Interaction design;

Keywords

Embodiment, Feminist Self-Defense, Participatory Speculative Design

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1 Introduction

Feminist self-defense is a form of victim prevention that teaches how to prevent and respond to interpersonal violence [26, 30, 66]. It addresses more extreme cases of violence as well as the “grey area of sexualized encounters” - unwanted interactions from strangers in public and transgressions by acquaintances in social or private

settings [29]. The practice consists of physical resistance training, along with an engagement with the topics of mental strength and preparedness, empowerment, the relationship with one’s body and the experience of living as a person potentially vulnerable to gendered violence [51, 61]. As such, it can be seen as a corporeal practice grounded in feminist values, whose teachings center the lived body [61]. It can also be defined as a bridge between two forms of feminist activism: empowerment via building physical strength and feminist consciousness-raising, in order to enact an embodied empowerment [57]. Given the aims of the practice, this paper poses the question of how embodied interaction design can empower beginner practitioners of feminist self-defense. To answer the question, we inquired into the experiences of first-time practitioners and explored how they can be used as a design resource. The project’s outcome is three speculative concepts “A room of one’s own”, “Fighting Baymax”, and “Optimal Grip” that were developed during a participatory design workshop. They conceptualize how technology may support beginner practitioners and are envisioned as explorations of technology entering this novel design space.

Recognizing the ambiguity of the term empowerment [65], we adopted the definition of empowerment as a “process by which those who have been denied the ability to make strategic life choices acquire said ability by accessing material, information, and ideological resources” [60]. Here, feminist self-defense is seen as the resource that contributes towards embodied empowerment - the process by which feminist self-defense practitioners gain the power to challenge a culture of gendered violence that serves as a tool for bodily discipline [48]. The project is thus situated at the intersection of feminist HCI [8] and design for bodily practices. It contributes to a reimagining of technology’s role in interpersonal gendered violence prevention by offering design guidance in the form of 6 design qualities. Beyond their relevance for embodied interaction designers, they also demonstrate how designing with the values of feminist self-defense can further Feminist HCI’s work - utilizing HCI insights for addressing the critical matter of gender-based violence in society [64].

2 Background

2.1 Technology for Self-Defense

In HCI, research on prevention of gendered violence can be seen in studies that address technologically mediated intimate partner violence prevention [52, 80], sexual harassment prevention [1, 2, 19], safety and risk assessment in dating apps [3, 18], providing assistance during disclosure and support-seeking [43, 59], as well as safety in public spaces [58], to name a few. The engagement of



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technology in the domain of self-defense is mostly visible in the design of self-defense tools e.g. panic button apps or wearables [85]. The devices are usually marketed towards women [69] and are often framed as artifacts that enhance the body with the property to defend itself [70]. However, they have also been critiqued for having a non-nuanced view of what constitutes an assault, and overlooking how intersecting power structures shape vulnerability to gendered violence [12, 69, 83]. This technology also repositions self-defense from a bodily faculty to a feature of an artifact. These critiques point to an opportunity for further research on how HCI can support prevention and protection from interpersonal gendered violence by building on feminist self-defense values, and thus proposing an alternative anti-violence socio-technical imaginary [69].

2.2 About Feminist Self-Defense

Gender based violence is defined as “any act that results in, or is likely to result in physical, sexual, or psychological harm or suffering” [64]. It is a complex social and political issue that in order to be tackled requires large-scale social changes [17, 66]. There is not one single course of action that can be charted to bring change, instead, multiple initiatives serve as pieces of a larger puzzle [26]. Noted examples of such initiatives are support centers for survivors of sexual violence [51], violence prevention programs that focus on potential attackers or bystanders, and feminist self-defense training [26].

Feminist self-defense is a form of victim prevention that teaches how to prevent and respond to interpersonal violence [26, 30, 66]. Its contemporary form stems from the activism of second-wave feminism [34, 51], though its practice has also been present during the suffragette movement [63]. Even though it is an individual practice, it has been argued that it has wider consequences, whereby practitioners become empowered to claim space and challenge gender norms that limit their social and political agency [17].

2.2.1 The “Feminist” in Feminist Self-Defense. Not all self-defense programs can be labeled as feminist self-defense. Even though some programs strive to teach protection from violence, in doing so they may also perpetuate harmful gender stereotypes [26] by prescribing ‘safe’ behaviors, employing victim blaming language, failing to facilitate a safe space, or by being unattuned to the complexities of gendered violence [17, 26, 66, 67].

What differentiates feminist self-defense is its grounding in feminist values, the taught techniques, and the context of the class [66]. Namely, the practice is built on the understanding that the difference between women’s and men’s bodies is socially constructed. Characteristics believed to be inherently female e.g., gentleness, low physical strength, and non-aggression are seen as a manifestation of “sexed embodiment” [51] - the effect of gender ideology shaping the body and bodily practices into what it prescribes to be the natural form. The practice seeks to undo these beliefs and disrupt the myth that protection against an assault is futile [51] by empowering practitioners to perceive their bodies as capable and worth protecting [17, 30]. It also aims to undermine rape culture by framing sexual violence as a social issue. It emphasizes that the victim-survivor is never responsible for an assault and recognizes that violence can manifest in many forms and be perpetrated by strangers, acquaintances, or intimate partners. [17, 26]. Feminist

self-defense teachers are thus positioned as both instructors and supporters of the practitioners [48] and conduct the classes with respect to differences in lived experiences [48].

2.2.2 Feminist Self-Defense and Somatic Experiences. The components of a feminist self-defense class can be roughly divided into the physical and the psychological. Although this is a loose separation, as they are actively interlinked [48]. Typically a feminist self-defense training teaches that resistance can be “forceful physical resistance (e.g. fighting the attacker), non-forceful physical resistance (e.g. running away), forceful verbal resistance (e.g. yelling), non-forceful verbal resistance (e.g. pleading)” [30]. The techniques are not prescriptions of how one should react, but as possible courses of action, as ultimately it is a personal decision how one should act (or not act) in the case of an assault [17]. Unlike more stylized martial arts maneuvers, these techniques are usually more accessible and relatively quick to master [26]. They can be practiced against ‘attackers’ during simulated assault role-plays with varying degrees of volatility [34], against instructors who hold pads [30], or against other students who roleplay an ‘attacker’ [48]. [23] point to the key role of the group in mastering the techniques. Namely, the group facilitates discussions, acts as an emotional support tool, and can help participants process the class content or past trauma [67]. The use of self-defense tools is usually not present in most classes, as that requires relying on an external tool that may malfunction, instead of relying on one’s own body [67].

The intended outcome of feminist self-defense is the acquiring of skills to respond to violence, as well as un-learning gendered habits and beliefs that may prevent one from responding. The existing body of literature also shows a multitude of transformative effects [26, 30, 50, 51]. Women who have taken these classes report having increased feelings of agency, self-worth, and confidence in their own bodies, whereby the body is experienced as powerful [30, 50]. This reverberates in other aspects of their lives, whereby they feel more assertive, able to establish boundaries, and communicate needs [30, 50]. Recent research points out that once the knowledge has been acquired, it has stayed with practitioners for decades [79].

2.2.3 Resistance and Critique. Despite the positive outcomes of the training and its growing recognition as a viable tool for gender violence prevention [68], classes are not widely available and the practice is still under-researched [36]. Resistance towards further study may stem from views that it can lead to a false sense of security, responsabilization, or a general lack of confidence in its goals [31].

The practice has also been the subject of feminist debates. In particular, due to the element of violence and its connection to patriarchal and colonial oppression, there has been hesitation towards a deeper engagement [50, 51]. Additionally, its second-wave feminist roots and the predominant grounding of existing research in the experiences of cis, white, Western women point to a need for an incorporation of an intersectional lens and illuminating the needs of non-white, non-Western, differently able bodied women [5, 51, 74]. There is also an urgency in moving away from a heteronormative construction of violence [62] and including queer and trans perspectives, given the historical omission of the latter from gendered violence discourse [37, 86]. While there are examples of trans inclusion in practice [4, 89], this is still absent from academic

research. The practice is also subject to ongoing debates regarding its application in tackling domestic or intimate partner violence [41]. However, emerging studies point towards the training's efficacy in resisting violence in cases when one is familiar with the perpetrator [72].

2.3 Theoretical Framing

Designing and speculating within the practice of feminist self-defense is to design and speculate with a body in movement. As such, we grounded our work in the theories of embodiment that refer to how our physical, social, and cultural bodies shape our experience in the world. The theories of embodied cognition [44], Merleau-Ponty's phenomenology of perception [78], and soma design [33] become especially relevant.

2.3.1 Embodiment and (Gendered) Bodily Habits. According to Merleau-Ponty, our kinesthetic sense is what grounds us in the world [22, 78]. We perceive and act on the affordances of the world due to the physical shape, properties, and skills of the body [44]. Thus, any change in our bodily skills will result in a change in how we perceive and act in the world [44]. However, the ways in which we move our bodies and the skills we train for is influenced by social values [44]. In a corporeal turn, feminist theorists have postulated that gender ideals manifest themselves not only on a consciousness level, but on a bodily level as well. Namely, traditional feminine norms such as gentleness, nurturing, and non-aggression have a direct effect on how women move and hold their bodies. This is labeled as 'feminine habitus' - a set of movements that are influenced by idealized, normative standards of femininity [50]. The existence of the 'feminine habitus' reinforces an understanding of the female body as docile. It can also limit the development of a relationship with one's body whereby the body is understood as a source of agency [50, 88]. Considering this, feminist self-defense can be seen as an interruption of sexed embodiment and fundamentally changing one's being-in-the world.

In HCI, there is an interest in how new embodied skill development can be supported by interaction design [22]. As such, building on an understanding that technology can support skills creation and prompt new soma experiences [44], these theoretical arguments are brought together for the purposes of investigating the role of technology in supporting the development of self-defense skills that are linked to embodied empowerment and the creation of a "new soma reality" [51].

3 METHOD

3.1 Participatory Speculative Design

This paper draws on exploratory design and is informed by the feminist HCI qualities of pluralism, participation, and embodiment [8]. It adopts the view that knowledge is socially and culturally situated, and, based on feminist standpoint theory, pursues knowledge that stems from the experiences of the lived and cultural body [8]. This stance informed the choice of method - participatory speculative design. As this is one of the first instances where technology enters feminist self-defense, the study's goal is to provide several design concepts that open a new design space. PD's commitment to respecting the knowledge of non-designer stakeholders and viewing

users as co-creators [71], aligns with the goals of feminist design research. Additionally, speculative design (SD) is utilized to show the power of design artifacts to "challenge the status quo and encourage imagination" [24]. This aligns with the project's goal of envisioning technologies that are informed by lived experiences and bodily sensations. PD compliments SD since it opens the practice to non-designers [20]. On the other hand, SD complements PD as it can shift the focus from the design of commercial artifacts to the imagination of future possibilities [6]. In this manner we build on existing HCI work that uses speculative design to explore technology's future possibilities pertaining to gender issues [42, 73].

3.2 Data Collection and Data Analysis

The study was conducted via interviews and two workshops with six participants, self-identified as women, selected via convenience sampling, and two interviews with self-defense teachers with more than 10 years of teaching experience (Table 1). The size of the sample was guided by the practice of having no more than 10 people in a feminist self-defense class, to allow for adequate time and attention for each practitioner [48]. While some of the participants had previous beginner-level knowledge of combat sports, they had little to no familiarity with feminist self-defense, with some associating the practice with learning hand-to-hand fighting maneuvers. The participants were not compensated for their participation.

The study was consistent with university ethics recommendations and according to Swedish regulations did not require formal ethical approval. As such, after extensive deliberation on the ethical considerations surrounding this project, we concluded that a formal ethical evaluation was not compulsory. This decision was primarily based on the nature of our methodology, which involved interviewing feminist self-defense instructors and arranging sessions with invited voluntary participants. Importantly, the study emphasized self-defense education and design processes rather than exploring the emotional or mental health of the individuals involved. Our focus was strictly on non-invasive bodily movements, bodily autonomy, and empowerment. We also had no interest in or collected any personal data about the participants.

Given that all study participants self-identified as women the project primarily focuses on the experiences of women practitioners. Thus we build on an understanding of 'women' as a category vulnerable to gender based violence, whereby the prevalence of fear from said violence [16] enacts a specific embodiment and being-in-the-world [50]. Drawing from "Intersectional Bodies" [32], we view 'women's embodiment' and 'women' as heterogeneous categories, shaped by different identity aspects. Moreover, operating from a "strategic essentialism" [75] position, we acknowledge that a feminist self-defense practitioner should not be equated to a cis woman given that this framing can lead to erasure of other categories vulnerable to gendered violence.

3.2.1 Interviews with Feminist Self-Defense Instructors. We conducted two semi-structured interviews with feminist self-defense instructors during which we inquired into their teaching process, the resistance strategies they cover, how emotional and mental aspects of the practice are discussed, as well as how/if the topic of empowerment is approached. These interviews helped us gain a deeper insight into the practical aspects of feminist self-defense.

Table 1: Overview of the study design, presented in the order in which each step was executed

Method	Outcome
Interviews with feminist self-defense teachers	Gaining deeper insight of the practice of self-defense
Workshop 1: Introduction to feminist self-defense (held by self-defense teachers)	Understanding of the basics of a feminist self-defense training
Interviews with feminist self-defense practitioners	Deeper insights into how the participants experienced the training
Workshop 2: Participatory imagining of feminist self-defense	A set of speculative designs created by the participants

One interview was conducted via a phone call and one via Zoom. They lasted between 30 minutes to 1 hour. Both interviews were recorded, and later transcribed and pseudonymized by removing names and personal characteristics. The data was subject to an inductive thematic analysis [14].

3.2.2 Workshop 1: Introduction to Feminist Self-Defense. The first workshop lasted two hours and was conducted in a martial arts studio by a self-defense teacher. It provided an overview of the basics of feminist self-defense and introduced the participants to specific combinations of movement and mental resistance training that would later be used as a design resource. The session was meticulously designed to ensure that participants were not exposed to any risk of harm or distress. We (and the feminist self-defense teacher) prepared the participants for each step. For example, given that the experience can be emotionally triggering, all participants were informed beforehand about the topics the class would cover, the feminist self-defense teacher asked the participants beforehand about their earlier experience of loud shouting (one of the strategies of self-defense). The participants were thus prepared and at any time could remove themselves from the sessions. The intention was to create a safe space where participants could explore new approaches, postures, and movements.

The participants were first prompted to practice verbal resistance by shouting “No” or “Stop” with a deep, confident voice. This was complemented by practicing the use of an assertive body posture and an assertive walk. Then they were presented with an overview of the Swedish law on the right to defend oneself, an overview of environmental awareness skills, how one can use common objects (e.g. a jacket or a backpack) or the immediate environment (e.g. activate a car alarm(s) to draw attention to an unfolding unsafe situation) as a way to enact self-defense. The teacher then gave an overview of threatening scenarios and self-defense techniques that can be potentially utilized. The participants practiced the presented techniques in mock fights among each other. The workshop concluded with an open discussion session.

The class was video recorded. The recording was reviewed after completing the thematic analysis of the interview and workshop data, and it was primarily used as reference during the creation of the design qualities.

3.2.3 Follow-up Interviews with Feminist Self-Defense Participants. Follow-up semi-structured interviews were conducted with the six beginner practitioners after their participation in the first self-defense workshop. The goal of the interviews was to gain a deeper insight into their experiences of feminist self-defense. As such, the practitioners were asked which aspects of the class they found easy,

difficult, and most valuable. They were also prompted to reflect on emotions and sensations that arose during different exercises, as well as their post-training behaviors. The interviews also created space for the participants to freely discuss any opinions or reflections that might have been provoked by participating in the training, whether pertaining to the social, cultural or to gender. Then, later, during Workshop 2, they were asked to more specifically focus on the body and bodily sensations.

The interviews lasted between 30 minutes and one hour. To ensure participants’ comfort, they were conducted via Zoom, allowing them to remain in their own space for its duration. All interviews were recorded, and later transcribed and pseudonymized. The data was subject to an inductive thematic analysis [14].

3.2.4 Workshop 2: Participatory Imagining of Feminist Self-Defense Technology. In the second workshop the same 6 participants were invited to imagine technologies that would support them in their self-defense practice. The workshop lasted for two hours and was divided into two parts. In the first half the participants reflected on their experience of participating in the feminist self-defense workshops via body maps [10]. Recognizing that this exercise can be a triggering activity, we opted out of recording it and emphasized that its sole purpose is facilitation of personal reflection.

In the second half of the workshop, the participants were invited to build on their experiences and to use them to conceptualize future technologies. To support the speculation, both probes [84] and guidance prompts were provided. The probes (Figure 1) are ambiguous items that can be engaged with and placed on the body in a variety of ways to facilitate thinking through the body. They were designed and handmade by the researchers specifically for the purposes of the workshop. When presented with them, the participants were encouraged to try to recreate some of the movements taught in the first workshop and find ways to incorporate the probes. The goal was to ignite speculation around what type of technology might fit in the practice, how it might influence the movements, and how it might feel when the body is in contact with it.

The guidance prompts (Table 2) were created based on findings from previous research on feminist self-defense. They consisted of four themes - centered around a specific aspect of the practice. The prompts were open ended, allowed for multiple interpretations, and often asked participants to reflect back on how their embodied experience might relate to the prompt. At the end of the workshop, each participant gave a short presentation of the future technology they imagined. The presentations were video recorded and analyzed via an inductive thematic analysis [14].



Figure 1: OWL [84] inspired body probes made from cotton fabric and synthetic fiber or plastic granules filling. Marbles were added to the filling of two of the probes in order to create variation in weight. Long satin ribbons were attached to allow for flexibility in how and where the objects are placed on the body.

Table 2: Guidance Prompts

Prompt Title	Goal
Breath	Focus the speculations on the importance of breath for the practice, considering that the control of one’s breath in critical situations is crucial for being able to use verbal or physical resistance.
Group Dynamic	Focus the speculations on the importance of the group dynamic for the practice, considering that the group can be a support mechanism for most practitioners.
Pain	Prompt the participants to consider the experience of both physical and/or emotional pain during the practice.
Pleasure	Prompt the participants to consider the experience of pleasure that is derived from feeling stronger in one’s body.

3.2.5 Speculative Sketching with Generative AI: Visualizing the Speculative Designs. The participatory speculative design workshop resulted in several concepts expressed in verbal form. To make them more tangible, we crafted visualizations using Midjourney - a generative AI software, and Adobe Photoshop CC. We chose to sketch with generative AI as it allowed us to focus on form-giving for provocation, without aiming towards actualization. By engaging in conversation with the generated art, akin to the ‘backtalk of sketches’ in speculative projects [11], we refined our interpretations of the participants’ descriptions. The unexpectedness in the generated images [55] allowed us to move away from more conventional visual tropes, while the glitches in the imagery, such as ‘unreal’ textures and structures that defy physics, accentuated the uncanny dimension of the speculations [82].

The participants were not involved in the image generation, since we were hesitant about introducing the use of AI to the design workshop, as it might shift the focus from embodied speculation crafting to form-giving. However, in line with emerging scholarship on AI use in participatory design [39], there is opportunity for investigations on its use in participatory speculative design as well.

4 RESULTS AND ANALYSIS

4.1 Interview Insights: Experiences of a Feminist Self-Defense Training

We identified six themes that capture the nuances of experiencing a feminist self-defense class for the first time. The themes are indicative of the participants’ attitudes towards the training as well as the ensuing reflections regarding their bodily abilities and being-in-the-world. These insights serve as a valuable backdrop for

understanding and reading the speculative concepts presented in the second part of this section.

4.1.1 Performative vs. Embodied strength. The interviews revealed conflicting notions over feeling strong vs. being perceived as strong. Namely, strength was defined as both a faculty the participants (can) have and as a performance they need to engage in to be seen as less vulnerable. They often linked strength to confidence in one’s ability to face adversity, with its sources tied to either mental or physical strength. Some participants emphasized mental strength as critical for self-defense, while others found feelings of strength stemming from the knowledge that one can indeed throw a punch. That latter was reflected in the interviews with the instructors, as they encourage practicing specific movements that can evoke feelings of strength.

Strength was also viewed as performative. Exercises in assertive posture were seen as acting and the body as a tool for making the act convincing. Outside the class, maintaining an assertive posture or walking confidently was considered a conscious act to project strength and be in control of how they are perceived:

“... If you really feel uncomfortable in a situation, I think I would still go back to it. . . I would try to remind myself to be like, “OK, stand up straight and be more upright and not just slouch” . . . As a preventative measure. . .”

4.1.2 Negotiating Vulnerability. The self-defense class prompted reflections on vulnerability. Participants discussed how their habits and behaviors might signal vulnerability and recalled moments when they have an acute feeling of their vulnerability being evaluated:

“... sometimes I’m more cautious because I feel like they just look at me and assess that I am alone and that is uncomfortable and I’m more actively thinking about what we were told [during the class] ...”

Participants saw perceived vulnerability as a security risk managed via body posture and attitude. While many felt generally safe, they acknowledged that being a woman comes with systemic vulnerability, highlighting how ‘feeling safe’ is contingent on external factors. This perception can be connected to the prevalence of rape culture, where gendered violence is almost always seen as a possibility [50].

4.1.3 Perceived Separation of Practice and Reality. Participants viewed the self-defense workshop as a safe yet artificial environment, removed from ‘real life’. This affected their engagement, as some struggled to immerse themselves in exercises like shouting or mock fights due to the friendly atmosphere or lack of a combative mindset:

“...Because we were in a friendly environment and we were like laughing... And I think that a thing like this [shouting] ...it should come from here [points to chest]. I can only do that exercise, or reach to that point when I seriously feel something inside...”

During the sparring exercises, it was not uncommon to restrain strength, or to apologize after hitting one’s partner, further contributing to the feelings of separation between mock fighting and ‘real’ fighting:

“...It was a lot of focus on apologizing and not grabbing too hard and you couldn’t really put yourself into the role or the situation ...”

This can also be seen as a reaction to transgressing the feminine habitus. The interviews with the instructors point out that this initial hurdle of becoming comfortable with shouting and fighting, might be the biggest obstacle to overcome. Some participants also questioned if self-defense is something that can even be simulated, as one cannot know how they might feel or react during an actual attack.

4.1.4 A Self-defense Class as a Space for Confronting One’s Physicality. The class offered participants a chance to engage with their bodies in new ways, such as shouting, hitting, or experiencing what it feels like to push and be pushed. These outcomes of being prompted to perform novel movements ranged from awkwardness and concern if they are moving their body ‘correctly’, to enjoyment:

“... Just trying out these new things that you haven’t really done before. I mean I’ve never grabbed someone like that before, so it was kind of actually fun...”

Interestingly, some participants experienced the act of shouting “No” and “Stop” as a purely physical activity, while others as a consequence of an emotional state. In the same manner, having an assertive stance was seen as both something the body has to learn and as a byproduct of possessing mental strength.

4.1.5 The Group as a Mediator of the Experience. The attitude of both the instructor and the other participants were seen as key factors contributing to how the self-defense class was experienced. The participants felt that they were in a safe space due to feeling

comfortable in the group, and due to the friendly approach of the self-defense teacher. These sentiments were especially prominent when describing the overall atmosphere and the discussion session at the end of the workshop:

“That was something I like, that everyone was taking it seriously”

Participants also often expressed the necessity of the involvement of other people in acquiring the practice.

4.1.6 Self-defense as Essential Knowledge. Participants viewed self-defense and being prepared for possible situations of assault or harassment as essential knowledge for women, equating it to a survival skill. They felt a responsibility to be educated and saw gaps in knowledge as personal security risks:

“This is a topic that all women should know about... that’s why you make yourself educated...”

Both the instructor and the other participants were seen as sources of knowledge, with the discussion session at the end of the workshop being seen as an opportunity to learn from the experiences of others. Participants also communicated uncertainty over remembering all of the shared information.

4.2 Workshop outcomes: Feminist Design Speculations

The design workshop resulted in concepts inspired by the participants’ self-defense soma experiences - materializations of their felt emotions [47]. They are grouped in two categories, derived from the thematic analysis of the workshop data. The groups are indicative of how participants speculated on the role of technology in feminist self-defense. Following the principle of “shared creativity” [20], for each concept we provide visualizations, further developments, and a critical reading [7] to situate it in a socio-technical context.

4.2.1 Technology as “Training Wheels” for Gaining Confidence. This theme is exemplified by two speculative designs labeled as “A room of one’s own” and “Fighting Baymax”. Both concepts reflect the idea that a “significant change in body or voice might affect how we think” [44] and speculate on the possible role that technology can play in facilitating said change. They explore how different modes of movement may enact bodily change and lead to gaining confidence and strength. The designs are indicative of the participants’ attitudes towards technology as a tool one relies on for a limited time, until they feel more confident in their self-defense skills, as one participant stated:

“Should you be dependent on technology, or should you be self-empowered?”

“A room of one’s own”: A space dedicated to somatic exploration. “A room of one’s own” (Figure 2) envisions a space where one can engage with one’s physicality in a variety of ways, from practicing kicks and hits to the use of an assertive voice. This is enabled by a variety of objects that are scattered about the room which can be kicked, hit, stomped on, jumped on, and/or simultaneously screamed at. Interacting with the objects would trigger a colored light emission, leaving its meaning open to interpretation. Depending on preferences, up-tempo music that inspires movement can be played in the background. The participants envisioned this room as



Figure 2: A room of one's own: A speculative design envisioning a space dedicated to playful exploration of one's physicality

a safe space where in an almost playful manner practitioners can test and push their own limits, and reflect on the experience. They speculated that interacting with this design would allow them to derive pleasure and confidence from experiencing the improvement in one's skills:

“Confidence is key to pleasure, to feel pleasure you need to be confident, and vice-versa”.

The design does not prescribe a certain way of moving. Instead, it encourages engagement with movements that elicit joy and sparks inquisitiveness about one's own physicality. The speculation can be linked to feminist self-defense instructors' stances on the importance of creating an atmosphere where practitioners can feel good about their bodies [67]. Moreover, the potential simultaneous use of movement and voice can be seen as a practice in voice-posture symmetry - a feminist self-defense teaching covered during the first workshop, which indicates that to be more successful in verbal resistance one's use of voice (loud and deep), verbal articulation (clear pronunciation of “No!” or “Stop!”), and posture (upright, assertive, maintaining eye contact) should all be in sync.

Our reading of the speculation indicates that its key provocation lies in its merging of a fitness space and a playroom, resulting in a place dedicated to safe somatic exploration. The technology that fills the room prompts users to engage in movement where the goal is not the shaping of the body in order to be seen as fit or to adhere to beauty standards, but movement for the sake of play. This welcoming of ‘rough’ play via purposeful collision with technology can offer benefits such as “somatic freedom” - the opportunity to express and learn about one's body [49]. Safe ‘collision play’ during childhood is seen as an important part of development of problem solving skills [49], which can however be restricted due to gendered norms surrounding one's expression of physicality [88]. As such, the affordance of a technology mediated experience of the “body as play” [38] can lead to increased awareness of one's

physical capabilities - an important aspect for any self-defense training [50]. We see this concept as offering a subversive take on exertion play [54], where one explores sensations that may rise when the boundaries of the feminine habitus are pushed. The design, however, also poses the question of how one is prompted to push further and go beyond their comfort zone in the first place.

“*Fighting Baymax*”: A robot sparring partner. “Fighting Baymax” (Figure 3) represents a robot whose aim is to challenge feminist self-defense practitioners to exert more force during mock-fighting. It is made of a soft material and contains sensors that measure the impact of a hit or kick. It can then prompt the user to ‘hit harder’ either via audio or colored light output. The robot can respond to practitioners' self-defense maneuvers by moving in and out of their peri- and extra-personal space, as well as around its own central axis. When engaged for longer periods of time, the tactile feel of the robot's surface changes, becoming warmer or even wet to the touch, to simulate the feeling of perspiration on skin. The workshop participants speculated that interacting with this technology would overcome the issue of beginners restraining strength during mock-fighting. One participant verbalized this as:

“You can practice hurting it, because it is not a human.”

This concept can be placed under the umbrella of technology utilized for the independent learning of physical skills [13, 53]. It allows for learning about one's own physical potential - a notable goal of feminist self-defense training [66]. The imagined interaction whereby strength exertion is inspired by the robot, but enacted by the human, or in other words the robot does not hit back, echoes feminist self-defense instructors that discourage practicing fighting maneuvers via role play [50]. They contest the use of attack role playing due to the belief that it may lead to further trauma [50]. However, other instructors may disagree, believing that “knowing that you can take a punch is almost as significant as knowing you can deliver one” [51].



Figure 3: Fighting Baymax: A robot sparring partner that motivates practitioners to exert more force

In our reading of this speculation, we classify it as somewhere in between a fully anthropomorphized robot self-defense instructor and a punching bag embedded with measuring sensors. We believe that its provocation lies in this ‘in-betweenness’. Namely, the semi-anthropomorphic, caricatured form and limited movements can actively discourage for the robot to be seen as a body [25]. It thus impedes connection forming. In this manner, self-defense practitioners would be able to use it as a tool for overcoming beginners’ inhibitions.

4.2.2 Mocking-up Reality – Technology as a Facilitator of Safe ‘Unsafe’ Spaces. The second theme points to the participants’ envisioning of technology as a facilitator for experiencing an attack in a safe and controlled environment. This is exemplified by “Optimal Grip”, an amalgam of several similar speculative concepts that simulate the experience of an assault.

“Optimal Grip”: Simulation of an assault scenario. “Optimal Grip” (Figure 4) is a concept consisting of a bodysuit with built-in data gloves and a VR headset, through which a practitioner can experience a simulated experience of an attack and put their self-defense skills to the test. During the interaction with the simulated assailant(s), the user can switch between a first-point perspective where they are actively defending themselves and a third-point perspective where they are observing a self-defense technique demonstration appropriate to the situation, by a virtual teacher. The latter can be initiated when additional help or advice is needed. The body suit is made of a textile that can expand, contract, or trigger thermal stimulation, to simulate contact from another body. It remains active even during a third-point perspective interaction by simulating the sensations one might feel if they were in the shoes of the virtual instructor. The participants envisioned the interaction as an individual experience, since, as one participant mentioned:

“In a real-life attack you are most likely to be alone”

They also stated that relying solely on a VR headset might result in a less immersive experience, hence the addition of the body suit. During the workshop, it was speculated that this concept would allow for an evaluation of oneself, by reflecting on one’s own expectations of an attack scenario, as well as the bodily responses and feelings that occur during the simulation. Thus, furthering one’s knowledge about one’s soma.

“Optimal Grip” can be seen as an example of using technology to simulate embodied critical situation experiences, similar to [87]. The design can also be labeled as an “uncomfortable interaction” [9], undertaken not for the sake of having a cultural or entertainment experience, but for the purpose of training and understanding oneself. The simulation creates opportunities for ‘thinking on one’s feet’, creating self-defense strategies based on one’s skill, and a continuous evaluation of those strategies as the simulated assault attempt is unfolding - all key lessons in a self-defense training [67]. Engaging with the design can be framed as an exercise in using one’s entire body, which as mentioned during the first self-defense workshop, may not come naturally for most people. The inclusion of the demonstration of context specific self-defense techniques echoes the notion that watching the performance of an action can be an important part of learning to perform said action [44]. Moreover, the sensations triggered by the body suit mitigate the aspect that just observing a performance does not translate to kinesthetic knowledge of sensations such as pressure, pain, or felt gravitational pull [44]. We argue that the design’s creation can be traced to the experienced separation between the safe environment of a class and the material reality of an actual attack.

In the design’s critical reading, we choose to focus on the simulation itself as a unit of analysis [7]. Even though specific details of the content of the simulated assault were not discussed by the participants, the imagined simulated experience still provokes further questions. Namely, how will the attack scenarios be rendered?



Figure 4: Optimal Grip: A VR bodysuit through which one can experience a simulated attack scenario

Keeping true to the content of a feminist self-defense training, we argue that it should incorporate opportunities for practicing both verbal and physical resistance. It should not focus solely on violent encounters, but also incorporate unwanted interactions and attempted unwanted touches in different social situations that are part of “the everyday sexism that many girls and women encounter” [29]. Thereby strengthening the message of feminist self-defense that any transgression that compromises one’s agency and integrity should be resisted. A second question that is provoked is one regarding the representation of the assailant. We believe this to be an especially potent question given that in the past some training programs that employ instructors who role-play attackers have been critiqued for emulating racial and class stereotypes [34]. Thirdly, it should be questioned how the content of the simulation will be decided and what would be the user’s role in this? This question ties into ongoing debates regarding the role of consent as negotiation in technology design [77]. As such, further discussions are needed regarding the incorporation of interactive opportunities for consent [56] in this type of immersive experience, given the importance of upholding practitioner agency. Looking at the simulation of an unwanted physical contact also opens questions about the possibilities of digital touch beyond communication [35] and as a medium for enhanced somatic understanding.

5 Discussion

This study sought to examine how advancements in HCI research on design for embodied interaction can be utilized to explore interpersonal gendered violence prevention. While prior research on for example inclusivity and the design of safe spaces has engaged with aspects relevant to gender-based violence [1–3, 18, 19, 52, 80], incorporating an embodied interaction perspective can offer novel insights. Technologies that engage tactile, spatial, or performative elements may offer deeper, more empathetic understanding and

engagement with the lived experiences of gender-based fears and threats. By focusing on feminist self-defense, we wanted to offer an intervention into the lived experiences of many people, vulnerable to gender-based violence today. We believe that research in this area holds significant potential for raising awareness and educating people about the lived experiences of gendered bodies in society.

In the discussion below we are highlighting aspects concerning prevention in general, and the design qualities that could contribute as a point of departure for further explorations when tackling gender-based violence within the context of HCI.

5.1 Interaction Design Qualities of Feminist Self-Defense Technology

The speculative designs open the design space of feminist self-defense by imagining technology that supports the teaching of a bodily practice [48] and can be used as a starting point for the design of future interactions that can potentially be seen as “embodied interventions” [17]. Based on the design workshop insights, we derived a set of 6 design qualities that can guide future explorations in this space.

5.1.1 Pushing Soma Boundaries. The first quality was derived from discussions on confronting one’s mental and embodied boundaries. Both in the literature on feminist self-defense and in our interviews with self-defense instructors it was highlighted that one of the most important milestones for beginner practitioners is the overcoming of inhibitions - becoming comfortable with performing movements that are beyond one’s feminine habitus. However, as discussed in the participant interviews, this may elicit feelings of anxiety and discomfort. In the feminist self-defense workshop, the instructor motivated the participants by stating the value of practicing a movement, regardless of how awkward it may feel: “If this practice makes a guy back off, trust me, it’s worth it”. As such,

interaction designers may need to consider how a system might elicit (and sustain) movements that are beyond one's embodied habits. This should, however, be built on an understanding that movements performed in this context may offer new perspectives on one's body, as well as invoke various meanings (e.g. learning to adjust one's posture for the sake of having a 'better' posture is experientially different from learning to adjust one's posture for the sake of perceived assault prevention). Moreover, for beginner practitioners even though a certain movement interaction is physically within-reach [45] it may be perceived as out-of-reach [45] due to gendered normative beliefs [51]. The design of technology that supports practitioners in pushing soma boundaries may also challenge gender normative beliefs surrounding bodily abilities, thereby reflecting feminist self-defense values.

5.1.2 Exploring Uncomfortable Emotions. The second design quality was derived from experiences pertaining to discomfort expressed by the participants during the self-defense workshop. Feminist self-defense instructors often emphasize the importance of "making your emotions work for you" - learning how to turn uncomfortable emotions into drivers of action during a critical situation [51]. Looking at the imagined interactions with the speculative designs, it can be assumed that they may trigger feelings of aggression, hostility, or fear, as exemplified by "Fighting Baymax" and "Optimal Grip". The participants speculated that getting to experience such emotions in a safe environment and becoming familiar with how they manifest may lead to learning to act in their presence. Designing systems that afford engagement with 'negative' emotions is not new in HCI [9, 40] and examples are plenty in the world of game design [15, 27]. However, facing emotions that stem from the awareness of the pervasiveness of gender-based violence, emotions that have marked practitioners' embodiment and being-in-the-world [16] - brings a critical dimension to the design. As such, systems that create space for a safe exploration of uncomfortable feelings and that bring a somatic understanding of emotions as an integral part of corporeality [33], can help feminist self-defense practitioners understand how different emotions may arise in different situations (e.g. does one feel angry, immobilized, or does one disassociate from the moment), how they might influence their actions, and how the practitioner may 'work' with these feelings. This can lead to a creation of "bodily memories that could be activated in a future confrontation" [74] and possibly a greater understanding of oneself. Given the emotional intensity of the experience, and the fact that the discomfort is not contained to that specific embodied interaction, but references systemic issues and possibly trauma [28.], designers should also consider how the user can be supported before, during, and after the interaction, as well as the possible ethical implications.

5.1.3 Engaging with Multiple Modalities. This design quality stems from the participants' speculations pertaining to the use of shouting and physical movements, as expressed in "A room of one's own". During feminist self-defense classes, instructors may encourage the simultaneous practice of verbal and physical resistance techniques, such as a synchronous practice of kicks and punches while shouting "No!", in order to train practitioners in breath control during physical resistance [50]. In the feminist self-defense workshop, this was exemplified by simultaneously practicing the use of an

assertive voice and an assertive posture. This can be translated to the design of interactions that rely on a combination of modalities, such as providing engagement through both movement and voice in "A room of one's own". Thus, designers may need to evaluate which modalities can and should be combined to better support the learning process.

5.1.4 The "Playful - Serious" Emotional Spectrum. This experiential quality derives from the idea that the concepts can be mapped along an emotional spectrum between playfulness ("A room of one's own") and seriousness ("Optimal Grip"). By using the term "playful", we refer to interactions that foreground joy of an unstructured somatic exploration of movements and the feelings that may arise when pushing one's limits. On the other hand, "serious" refers to interactions that carefully negotiate the boundary between safety and threat, and that may more closely resemble the very experiences that practitioners are training to resist (while still maintaining user safety). Playful interactions were seen by the participants as a way to ease one into the practice and spark confidence in one's body. However, as noted in the interview insights, for other practitioners this may prove a distraction, hindering their full immersion. This points to a need for the incorporation of a more emotionally 'serious' training practice. As such, interaction designers should carefully consider which end of the spectrum they are designing for.

5.1.5 Reflection-Through-Movement. The fifth design quality stems from the participants' experiences, whereby engaging with the practice prompted reflection on their own embodiment. Via the speculative concepts, the participants envisioned dynamic and explosive movement as the primary mode of getting to know one's soma and reflect on one's boundaries. The quality is exemplified by "A room of one's own's" affordance of a playful engagement with one's physicality, "Fighting Baymax's" challenge of going beyond one's perceived bodily limits, and "Optimal Grip's" affordance of putting one's strength and vulnerability assumptions to the test. The reflections facilitated by these more explosive interactions were seen by the participants as an important step in gaining knowledge about oneself. This echoes the view of feminist self-defense as a practice that prompts one to reflect on gendered body expressions and affords their redefining [50]. This quality provides a contrast to earlier research on slower movements and reflection, for example through yoga, Feldenkrais, or other slow movement techniques [33, 76]. As such, designers may need to consider how reflection may be facilitated by different modes of movement, from more exploratory ones as in "A room of one's own" to more directed ones as in "Optimal Grip".

5.1.6 Kinesthetic Empathy. The final design quality was derived from the third person perspective feature of "Optimal Grip", as well as interview insights that highlighted the instructor (and the instructor's demonstration of strength) as a source of motivation. Kinesthetic empathy as a phenomenon refers to how observation of movement may elicit bodily responses in the observer [21]. It is often echoed in earlier embodied interaction design research on dance, and the learning of dance moves [44]. It can also be seen in the work of feminist self-defense scholars that highlight the importance of observing mock fight demonstrations [23], repeatedly observing other practitioners perform self-defense maneuvers and

successful deter attacks is both a learning opportunity and a reinforcement of the belief that one is indeed able to defend themselves [23].

In the speculative designs, this was explored through the feature of “Optimal Grip” where one can ask for assistance by a virtual instructor that can demonstrate context specific self-defense techniques. As such, an important consideration of this design quality is how bodies and movement are deconstructed and represented to enhance kinesthetic empathy.

5.2 Rethinking Technology and Design's Role in Interpersonal Gendered Violence Prevention

Prior research on feminist self-defense identifies “strength uncovering” as a key goal of the practice and the catalyst for empowerment [74]. Embodied strength was understood by the participants as arising from the development of embodied skills. The participants' speculative designs thus aimed to support such skill development, by framing technology as a tool for learning self-defense rather than a tool or weapon in itself for self-defense. This echoes the practice's focus on broader defense strategies, such as mental preparedness, ‘thinking on one's feet’, utilizing common objects and environmental affordances, and leveraging one's body to deter assault. These approaches require embodied skills, viewed phenomenologically as skillful interactions with one's lifeworld [81] - thus framing the speculations as technology that helps support said interaction. In this manner, the sensations, emotions, and knowledge that can potentially be elicited from interacting with the designs, can be seen as scaffolds in developing embodied skills and cultivating embodied empowerment - the “new soma reality” [51].

By defocusing from the design and development of weapons, or apps and devices akin to panic buttons, the speculative designs offer an alternative socio-technical vision for gendered violence prevention, one that envisions technology-supported embodied empowerment and feminist consciousness-raising. While still sharing aspects of tech-facilitated empowerment, these designs diverge from “techno-fix” attitudes [69] by grounding themselves in feminist self-defense values. However, they do not suggest that merely interacting with these technologies ensures immunity to gendered violence, nor do they imply personal responsibility over the occurrence of potential attacks if such tools are not used.

Moreover, since in a speculative design approach, part of the practice is speculating not only through design but also about the consequences of such a technology existing in society - the larger context in which the designs could exist was briefly discussed during the second workshop. Namely, if such designs align with commercial interests and the logic of profit, who will have access to and benefit from this imagined future technological development, what would these speculative designs' environmental impact be, how might they be used by bodies of different abilities and sensory needs, how should users' data be protected, as well as possible misuses or malfunctions of the designs. The speculative concepts also touch upon debates of whether feminist self-defense leads to individual or collective empowerment [50] and the question regarding the necessity of simulated volatile experiences [50].

It should also be noted that the speculative designs frame the experience as more of an individual practice, which somewhat contradicts the importance of the group when learning feminist self-defense [23]. This could indicate that the participants saw the focus on their own body as the core of the practice and the social as an added contextual layer. However, currently, these questions are beyond the project's scope.

5.3 Future Directions

Due to the nature of the research design several limitations were encountered. For example, the smaller sample size and the convenience sampling strategy resulted in a participant group that skewed towards a similar demographic. As such, the study may have only partially achieved a plurality of voices and experiences. Furthermore, as the development of self-defense skills may take time to develop, the results may not be indicative of the experiences of practitioners who have undergone longer training. Moreover, the use of interviews naturally resulted in issues of participants relying on their memory of a self-defense class as the interviews were conducted after the fact, separately from the context [46]. This may have resulted in loss of capturing some aspects of the experience. This points to a need for larger scale studies that involve designers, self-defense teachers, and practitioners from a variety of different backgrounds. Our study also illustrates the opportunity for a closer examination of how feminist self-defense technology can achieve a balance between the physical and the psychological, as it is the merging of the two that enacts its empowering outcome [36], and how to circumvent further trauma when a person engages with the training outside of the supportive environment of a class. Moreover, since the social element of feminist self-defense did not play a prominent role in this study, additional studies can be undertaken to look closer at how technology can better support this aspect of the practice. Future research may also explore the role that feminist self-defense technology can play in activist efforts of gendered violence prevention.

6 CONCLUSION

The aim of the project was an exploration of a novel design space - feminist self-defense. Feminist self-defense is a pro-active interventional approach towards the threat of gender-based violence that includes both embodied and mental strategies for personal protection and, maybe most important, empowerment [17, 50]. Grounded in theories of embodiment, this study first inquired into the emotions and experiences of first-time participants via semi-structured interviews. This was followed by a participatory speculative design workshop, in which the participants were prompted to use their embodied experiences as a resource for imagining the design of technology that would support their practice. This resulted in speculative design concepts that point towards technology playing the role of a tool for gaining knowledge about one's soma and a tool for acquiring self-defense skills. Analysis of the interviews and the speculative concepts lead to the identification of 6 design qualities: pushing soma boundaries, exploring uncomfortable emotions, engaging with multiple modalities, the ‘playful-serious emotional spectrum, reflection-through-movement, and kinesthetic empathy. They provide guidance and a point of departure for further research

and development, opening up new pathways for designing technologies that support the practice and are sensitive to the needs of the body, the mind, and the broader socio-political landscape. As such, this project not only contributes to the growing field of feminist technology design and a rethinking of the role of HCI research on interpersonal gendered violence prevention, but also encourages dialogue and innovation around the intersection of technology, embodiment, and feminist self-defense.

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