
One Becomes A Woman: Feminist Interactive Art Based On Eye-Tracking

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Abstract

The male gaze is a concept coming from the film industry that elaborates how women are depicted as sexual objects from a masculine perspective. Nowadays, we can see male gazes almost everywhere in daily life, from visual arts to social media. It implicitly influences and shapes the female community, contributing to some familiar issues such as objectification of women and body shaming. To raise the awareness of the male gaze's impact on women and improve their own body's subjectivity, we designed an interactive website that allows people to experience the male gaze digitally. Users can see how a female body shape is becoming more and more stereotypical feminine by interacting with their real gazes. The evaluation results prove that our design has a positive impact on users and they feel encouraged after trying it out.

Author Keywords

Feminist HCI; Male Gaze; Eye-tracking; Visualization.

CCS Concepts

•**Human-centered computing** → **Human computer interaction (HCI)**; *Haptic devices*; User studies; Please use the 2012 Classifiers and see this link to embed them in the text: https://dl.acm.org/ccs/ccs_flat.cfm

Introduction

As Simone de Beauvoir said in *The Second Sex*, “One is not born a woman, one becomes a woman.” In this book, she describes how society shapes women and affects her attitude towards her own body. She pointed out that whether a woman’s body is presented as positive or negative depends on the degree to which she herself is a subject, rather than an object of society’s gaze[9].

The male gaze is defined as the act of describing women from a masculine perspective, and regarding women as sexual objects that pleasing the heterosexual male viewer[7]. The concept of the male gaze was first used by feminist in the film industry[8], and the objectification of women also exists in visual arts[11] and literature[8].

We conducted a survey about male gaze. Out of 18 women, 11% affirmed they always feel the male gaze, a third of them often feel it, another third feel it sometimes and 22% rarely feel it. None of them said they have never felt the male gaze. It is clear from the results that every woman has felt the presence of male gaze more or less in their lives. We also asked participants to write 5 words to describe themselves physically. We found that some of the words they chose were negative and implied their desire to pursue a certain ideal state of their body image. Based on this result, we can tell that even though women are aware of the existence of male gaze, they unconsciously require themselves from the male perspective and hold a negative attitude towards their body.

In this paper, we focus on the research question of how to design interactive art to raise the awareness of male gaze’s influence on women, and help them improve the subjectivity of their body. We reviewed related literature, designed a web-based experience and conducted an evaluation based on it. This paper is structured as follows: we start with in-

roducing the background research about feminist Human Computer Interaction(HCI) and male gaze; then we describe how we design and iterate the web-based experience; after that, we will show how we evaluate the design in both qualitative and quantitative ways; finally we will discuss the impact of our design and how human perception towards male gaze and body subjectivity has been changed after experiencing it.

Related Work

Feminist HCI

Feminism plays a productive role in the broad design field and has brought new strategies and methods to HCI. Bardzell summarized the qualities of feminist HCI and two ways that feminism can contribute to interaction design, critique-based contribution, and generative based contribution[2]. We adopted a generative method in this design, using feminist methods in the design process to discover design opportunities and generate new design insights. We selected male gaze, a feminist theory, as the foundation of our interactive art, which makes the HCI methodology we adopted feminist[3].

Male Gaze and Female Self Gaze

Whether or not to take the self as the subject will determine the outcome of female self gaze. When there is a lack of self-awareness, the female self-gaze is likely to be influenced by the male gaze and become a continuation of it, leading to more severe self-objectification. However, when the females are ware of themselves as the independent subjects, self-gaze can become a way to empower themselves.

Clark studied the gaze in a male-dominated gym environment and pointed out that men not only gaze at women’s body and femininity but also gaze at women’s behaviors



Figure 1: In this image, the user is training the eye tracking model by clicking on the eyes on the screen.

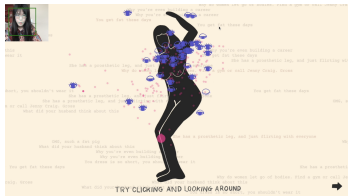


Figure 2: In this image, the user is interacting with male gaze screen by eyes.



Figure 3: In this image, the user looks at herself and speaks out the affirmation sentences on the screen.

that are not "norm." At the same time, women will unconsciously cater to men's desires and gaze at women including themselves[6].

Almeida and colleagues designed Labella, a system guiding women to observe the hidden part of their body. By looking at their own bodies, women pay attention to reproductive health and their own happiness and overcome taboos[1]. Campo and colleagues' work, the Curious Cycles, which is dedicated to helping women explore the menstruating body, also includes a step of observing the vulva. This self-observation increases women's knowledge of the body and arouses reflection, and the understanding of one's body is an expression of the body's sovereignty[5]. In this way, the self-gaze empowers women.

We expect that when women have a clear understanding of the male gaze's influence and gaze themselves while regarding themselves as the subject, they will accomplish self-empowerment rather than self-objectification in the gaze, thus appreciating their own body.

One Becomes A Woman

One Becomes a Woman¹ is a web-based experience. It starts with Simone de Beauvoir's quote, "One is not born a woman, one becomes a woman". After clicking the start button on launch page, users are provided two choices to experience the design. One is eye-tracking mode, which asks for their camera permission and allows them to interact with their own gazes; the other is mouse interaction mode, which allows them to interact with their mouses.

We recommend users to select the eye-tracking mode, after selecting it, they will be guided to a training screen(see Fig-

ures 1), which is designed to help the web camera to learn the position of their real-time gazes. To do so, they have to click and open five eyes on the screen while looking at the mouse cursor at the same time.

Once the training is finished, users will go to the male gaze screen(see Figures 2). Here the concept of male gaze is visualized in a digital way. Initially, a neutral human figure is displayed in the middle of the screen. When users are interacting with it by gazes or mouses, such as looking at it, its body shape will gradually become more and more stereotypical feminine, simulating the accumulated male gaze's effect. Besides, there are many blue eyes tracking the users' gaze or mouse, which represent eye movements of males in reality. The gaze or mouse movement will also leave permanent pink dots on the screen, illustrating how judgment stays with females even after it happens. In the background, there are some negative comments moving all the time. They're commonly heard by women and we took them from public online resources. The background whispers give us an idea of a crowd and how a woman feels when being judged. When clicking on the background, the whisper's volume intensifies to simulate the overwhelming crowds. Simone de Beauvoir's quote read by female voices tells the story of women being shaped by male gaze.

If users select the mouse interaction mode, the mouse cursor will replace the gaze while the other parts of the experience will remain the same. In mouse interaction mode, the pink dots on the screen show the mouse's trace, and the blue eyes track the mouse movement.

Once this body shape changing is over, an arrow at the right bottom is highlighted, users are prompted to continue their experience into the next screen, the question screen. Here we force users to reflect on their body image, and they are asked to fill in a negative word they associate with

¹ Address of the project website:
<https://tingying-he.github.io/one-becomes-a-woman/>

themselves. Negative comments received by other women are still moving in the background, which gives them a sense that they are not alone. After that, they will be guided to the last page, the self gaze screen (see Figures 3). The self gaze screen aims to help women improve their body image and break down the negative impressions they associate with themselves. Users can see their selfie either through a webcam or black screen based on their previous choices of whether to open the camera. The words "You are not" followed by the negative word they inputted appear on this screen, destroying these negative self-views. Some affirmations appear on the bottom, so the users are encouraged to say to themselves these positive sentences while dismantling negative self associations they hold.

The entire website is implemented using JavaScript. The eye-tracking function is implemented with WebGazer.js[14]. We have derived from our own experience that five clicks can make eye-tracking accuracy sufficient for this project's needs, so we ask participants to click five times while training the model. The blue eyes and female body animation of the male gaze screen are implemented with p5.js[13].

In terms of color code, we use dark blue to represent men, pink to represent stereotyped women, and powerful purple to symbolize the female power.

Evaluation

Hypothesis

We expected that our design can raise the awareness of the male gaze's impact, and improve the female's subjectivity of their body. Based on this hypothesis, we conducted an evaluation for the experience of One Becomes A Woman.

Methods

Since our target user group is female, we mainly recruited female participants. Four people who identify themselves

as females and two people who identify themselves as males participated in our study. We asked participants to experience our website on their own computers and applied a 5-point Likert scale survey[10], semi-structured interview[12], think aloud[16], and thematic analysis approach[4] to analyze their experience.

Following the informed consent, participants were required to fill in a 5-point Likert scale self-reported survey. In the survey, they have to rate to what extent they agree with some statements about body appreciation[15]. Then a semi-structured interview was conducted to learn about their self-identification in terms of gender, perception of the male gaze. Finally, they were asked to write down three words to describe themselves. After the pre-test interview, participants were given 10 minutes to try out our design by themselves. During the process, they were encouraged to think aloud and share their feelings with us. After the experience, participants were asked to fill in the same survey again, and similar questions were interviewed for them as well.

We processed the data after the participants finished the evaluation. First, the scores of the surveys were calculated, and the higher the score is, the more positive attitude they have on their body image. Second, the data collected through the interview was analyzed using a thematic analysis approach[4]. One author undertook the coding of the entire data set resulting in several themes that clearly presented participants' reflection on gender and male gaze. All authors then worked together to review and discuss the themes and related data to generate insights.

Results

We calculated the results of the self-reported survey and compared the average scores to see if participants' per-

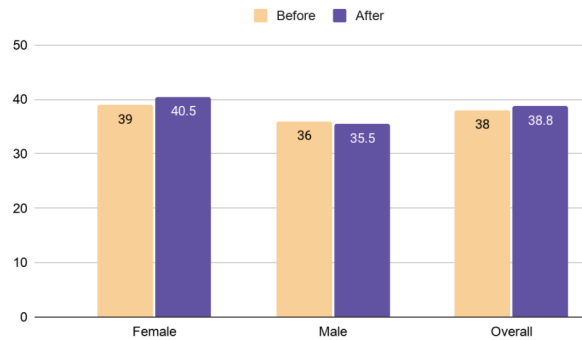


Figure 4: This chart shows the average scores of male and female participants before and after experiencing our design.

ception of their body image is improved or not. As shown in the chart (see Figures 4), the average score for female users has increased by 1.5 points, while for males, it has decreased by 0.5 points. Overall, the score is increased by around 0.8 points after experiencing our design, which proves users' perception of body subjectivity is positively enhanced, although it's not very much.

From the interviews we conducted before and after the test, participants got a better understanding of the male gaze's negative impact by experiencing our design. The design makes people aware that the male gaze shapes the female population. Simultaneously, people feel that it has a positive effect, making them feel encouraged and better.

In conclusion, users could understand our design and have a more in-depth perception of the male gaze after using it, and this website could give them a little courage.

Discussion

Gender identification

When discussing gender identity, almost all users mentioned the need to perceive this issue from both the physical and psychological perspectives. The physical characteristics they are given at birth greatly determine their gender identity for the rest of their life. Regarding the difference between females and males, most female participants mentioned how gender roles influence them in a male-dominated society.

Perception of the male gaze

Participants' understanding of the male gaze varied, but the female group was clearly more aware of the male gaze's negative effects, and they could cite multiple examples of the male gaze in their lives. One female user said that she felt sad that many people are not aware of the male gaze, either females or males. As for males, one of them was not aware of the male gaze concept at all. After experiencing the design, he got an initial understanding of it, which he described as *"Men stare at female bodies all the time"* and *"Women receive more judgment on their appearance."*

Feelings and emotions

Most participants feel the overall design gives them a warm and intimate feeling. But the male gaze page also inspires negative emotions in some female users at the same time. For example, one female participant said she felt angry and wanted to fight back when she saw and heard negative comments about women. Another female participant got goosebumps when she heard male whispers and female voices simultaneously, and she said, *"I feel uncomfortable because I knew what they were whispering about."* In contrast, one male user felt guilty after experiencing this design, and he mentioned, *"I think most requirements towards the female body, like slim and tall, are from males. I feel*

guilty as I'm afraid I also did some male gaze thing before in my life, and it may hurt some females unconsciously".

The impact

Participants can get the message we want to deliver via this design. One mentioned, *"My feeling is that it tells a story about how a female is shaped by the male gaze"*. And another participant states that *"I feel I am the woman on the screen, and feel that I am an object that is watched by others, I am not myself. I feel oppressed."* Therefore, we can see those female participants can empathize with the design very much and be aware of their condition in society by interacting with it.

Besides increasing the awareness of the male gaze among people, we also want to see how our design can impact users. From the evaluation results, most participants view the design as a positive thing. They're encouraged and feeling better after experiencing it, even for male participants. One male mentioned that he thought he does not need to become the person others define as a male. However, the impact we created is not strong and powerful enough. One female user gave up trying to say the positive affirmations aloud on the last screen because she did not think it would work.

We also found that the small camera window we introduce to help gaze detection training caused some unexpected impact. One female user kept looking at her selfie in it and confirming if she looks good or not. She said that the camera window is distracted as she can not stop to check it when she can see her face, *"the camera window is distracting because I can not stop to check my face as long as I can see my face."* She also emphasized that maybe women are all so interested in their faces. It could be very interesting to explore further women's psychological motivation behind such behavior.

Another distracting issue is caused by the poor accuracy of the gaze detection API we applied in our design. Some technical background participants paid a lot of attention to observe if the gaze detection is accurate. However, the inaccuracy of eye-tracking made non-technical background participants get lost. It is difficult for them to associate the red dot on the screen with their sight line in this situation, and because of this they were confused about how the entire system works. It reminds us that users' relevant knowledge determines whether they can understand what is currently happening in the case of technical failure. This finding gives us an inspiration that we need to pay more attention to the learnability and accessibility of the technology when designing for possible error scenarios to support vulnerable groups in the face of technology.

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