Shadoji: View Body Shapes from a Different Angle

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ABSTRACT

Body shape anxiety is one of the common problems distressing people around the world. While people are constantly suffering from body shape anxiety, they do not realize that beauty standard is not an absolute truth and that it is changing and depends on time and space. To help people free from the constraint imposed by social beauty standards and connect those who have concerns over their body shape, we devised a technological solution named "Shadoji", which can bring people a new perspective on their body shapes, give them a chance to create their unique body shape emoji, and to explore diverse body shapes from users around the world.

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KEYWORDS
negative body image; body shape; beauty standard; interaction technique; projector

1 INTRODUCTION

Sociocultural ideals of body shape have been favoring one group over the other. Those who are considered fitting into existing body shape standards gain a tremendous amount of benefits from societies, such as better employment results, higher wages, better interpersonal relationships, thus having higher self-esteem and happier life. For individuals who are deviating from expected cultural norms of body shape, this pattern of appearance prejudice is working against them, where they are experiencing social isolation, impaired social relationships, a lower rate of employment and lower wages. This, in turn, poses a higher risk of anxiety, depression, eating disorder, and suicide. As we can see, poor body image resulted from social beauty standards can lead to severe consequences for "psychological, social, economic, and physical well-being" [7].

The anthropologist Peggy Reeves Sandy posits, "It is through the body image that human beings become not only self-aware but socially aware." However, this is just the depiction of the White middle class in the 19th century. As media rose in the 20th century, the emphasis on women has been shifted from "inward character and service to society and toward outward beauty", and the female body shape depicted on media is unrealistic. Women gradually developed the notion that their personal identity is associated with their body shape and the control of their appearance [10].

Body image represents a large portion of one's self-esteem, and self-esteem is crucial to one's mental health and social behavior. We would like to help people develop a "positive self-image and a strong sense of self-worth" [8], and thus be able to ease body shape anxiety. How to design an interactive technology to help people realize body shape diversity is the question we are tackling.

2 RESEARCH

Body shaming has become a severe social problem. According to a 2014 survey, 60% of the youth believe that they have a negative body image [3]. Those who have a negative body image do not appreciate their body; they feel unhappy, unconformable, unconfident and unsatisfied with their body [13]. This negative feeling lowers their self-esteem and causes mental health issues, such as anxiety and depression [5, 13]. We hence design our solution based on people's negative body image. Our approach relies on the literature review, interviews, and qualitative data analysis.

2.1 Literature Review

We conclude that beauty standard is one of the main reasons influencing people's behaviors, bringing the pressure and negative body image. We found that beauty standard evolves over time and varies from region to region, and that it is influenced by race, ethnicity, artistic movement, and the state of a country [1, 2, 6]. For example, the body shape of Venus, a representation of sex and beauty, varies over time, from the apple shape in 30,000 BC to the places during the same century [2]. In Chinese history, the standard of beauty was also changing. Modern ideal woman's body is considered to be slim while plump women were more favorable in the Tang Dynasty [1, 4].

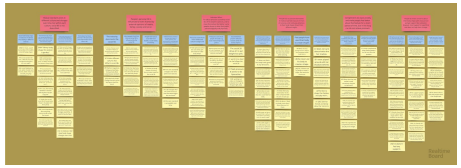

Figure 1: We use RealtimeBoard to construct and organize our digital affinity diagram. Yellow notes are affinity notes. One blue note summarizes one group of affinity notes. One red note summarizes several groups of blue notes.

2.2 Semi-structured Interview

We consider our target audience to be those who have a negative body image and may be suffering from the constraint imposed by social beauty standard. To further understand:

- Whether and how social beauty standards drive their behaviors
- How social beauty standards and personal beauty standards influence each other
- How social connections and compliments support them
- How other approaches may help them relieve anxiety

we interviewed 6 people including 1 African American female, 2 White American females, 1 Chinese female, 1 Korean male, and 1 Hispanic American male. All 6 participants are currently living in Ann Arbor, Michigan; their age ranges from 20 to 40. We used a semi-structured interview method: we prepared an interview protocol, followed an overarching question during each interview, and collected qualitative data from both close-ended and open-ended questions [9].

2.3 Affinity Diagram

We conducted an interpretation session for our interview notes and put them into affinity notes. We used the KJ Method to categorize and organize these qualitative data to create an affinity diagram (also called affinity wall) [11]. The diagram is hierarchical, as shown in Fig. 1. It is constructed out of groups of clustered affinity notes, and each group of notes is summarized with one sentence.

3 FINDINGS

The affinity diagram reveals the following insights:

- Participants admit that their personal beauty standard is influenced or even framed by social beauty standard given by media, celebrities, family, and society.
- Although beauty standard varies in different cultures and changes over time, within each culture and at any given time, the social beauty standard is relatively identical.
- When people share concerns about their body shape with family and friends, the feedback they receive cannot ease their anxiety.

Constrained by single beauty standard within each society, people do not get enough exposure to the idea that there should not be a single type of body shape and that body shape diversity should be advocated. Therefore, our team devoted to devising a technological solution that enables people to view their body shape from different angles and to express their own understanding of beauty; brings the population the awareness of body shape diversity, therefore to challenge the single beauty standard imposed by each society.

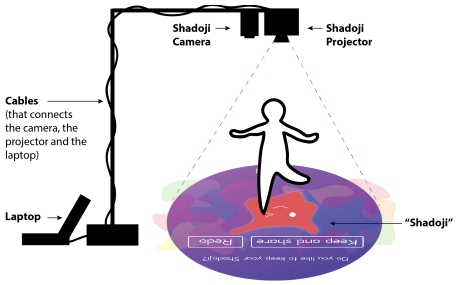

Figure 2: How users interact with Shadoji hardware.

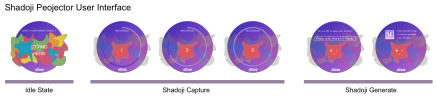

Figure 3: Three stages of Shadoji interface when users interact with hardware.

4 IDEATION

According to the results from our research, we determined that the following criteria should be met for our design:

- Design solution should reflect the existing social issue of hegemonic body shape while catering to the general population.
- Design solution should allow people to show their body shape in a flexible and spontaneous way.
- Design solution should bring social influence by users' voluntary dissemination and the formation of online communities.

With these design criteria, we brainstormed 18 design solutions, and we came up with 7 criteria to evaluate these design solutions, they are: 1. degree to which problem is solved; 2. technical feasibility; 3. user friendliness; 4. elegance/simplicity; 5. level of enjoyment; 6. chances to go viral, 7. degree to meet design criteria. We assigned weights for these rubrics, and then we scored all of our 18 design solutions. Among these 18 design solutions, we chose the one with the highest score.

5 DESIGN SOLUTION

Shadoji System is composed of a global interactive device (Shadoji Projector) and a mobile app (Shadoji App). The name "Shadoji" is derived from "shadow" and "emoji". Shadoji is a cartoon image formed by the shadow of a user and the cross section of her body. Shadoji can move, has moods. It can be generated from different regions and cultural backgrounds. Users could interact with the device offline to obtain their unique Shadoji. They can edit and share their own Shadoji in online communities and explore other Shadoji around the world.

Shadoji System gives users a chance to view their body shapes from a different angle in an entertaining way and to convey their ideals of beauty by allowing them to create their own ideal body shapes. It motivates users to spread this idea and help them gain support from family and friends. In the meantime, users would form an online community with aggregated data visualization presented to show them that the body image behind Shadoji varies from time, space, and personal opinions.

5.1 Shadoji Projector (The Hardware)

Shadoji Projector is a combination of a camera and a projector. It will be placed at different geographical locations with two states: idle state and capture state. In the idle state, Shadoji prompts users to walk towards the projector and download the app by projecting an appealing image on the ground. When the user interacts with Shadoji Projector, it would switch to the capture state. The user is asked to jump three times while at the same time the camera records the body shape and the system generates three moving Shadoji. Users can scan the QR code to browse and edit their Shadoji, or regenerate a new Shadoji from the mobile app. Working flows are shown in Fig. 2 and Fig. 3.

Figure 4: User interfaces of Shadoji App.

5.1.1 Idle State. Under the idle state, the projector projects a QR code on the ground for users to download the app. The system continually plays short audio "Wanna see a different angle of your body shape? Stand on the projection!" to attract people to walk towards the Shadoji Projector.

5.1.2 Shadoji Capture. When a user stands under the Shadoji Projector, its camera detects the user. Then the projector projects a prompt "Ready? Jump!" on the ground and the system plays an instruction as well. 'One!', 'Two!', 'Three!' The users will jump three times by following the prompt on the ground and the audio instruction. The entire process of a jumping shadow will be recorded by the camera.

5.1.3 Shadoji Generate. After a user jumps, Shadoji Projector will replay the jumping process and project two options: "delete" and "save and share the QR code". The user can choose whichever option by stepping on it. If they step on the "save and share the QR code", a QR code will be generated and projected on the ground. Then, users can open the Shadoji App to scan the QR code, download and edit their own Shadoji in the app.

5.2 Shadoji APP (The APP)

Shadoji App offers a convenient way for users to scan the QR code and modify their own Shadoji at any time. The app has three main features: Shadoji Generate, Shadoji Sharing, and Shadoji Explore. On the app, users can download and edit their own unique Shadoji. After modifying Shadoji, users can share their Shadoji on social media via Shadoji Sharing. They can also explore other people's Shadoji in an online community. App working flow is revealed in Fig. 4.

5.2.1 Shadoji Edit and Share. After downloading Shadoji, users can edit properties of their Shadoji, such as name, color, emoji, and location, and add text for their Shadoji. When their own Shadoji is generated, users have an option to share it on social media. With the sharing feature, we are hoping to achieve the notion of breaking the beauty standard, appreciating heterogeneous beauty, and promoting viewing beauty from different angles.

5.2.2 Shadoji Online Community. Each user has a Shadoji map. Every time a user's Shadoji is viewed by others, a Shadoji mark will show up in the associated region on the map. The user can take photos with Shadoji that are shared by other users around the world and create a Shadoji family. These sharing functions help Shadoji users form a strong affectional bond.

5.2.3 Shadoji Explore. Users can explore Shadoji from around the world via the Shadoji Explore feature and realize that each's Shadoji is unique, so the concept of diverse beauty of body shape will be re-emphasized.

5.3 Further Work

In the future, we plan to improve our current system by asking potential users to do usability testing. Also, we will create more interactive features on Shadoji, including dancing with Shadoji from different locations, establishing long-term online communities, and promoting understandings between users, their family, and friends.

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6 CONCLUSION

While life is filled with all kinds of anxieties, body shape anxiety should not be one of them. For those who once in a while or are constantly suffering from this anxiety, they should not bear this feeling alone with no support coming from others. We designed our solution aiming to help people realize the absurdity of beauty standard imposed by society and express their personal ideal of beauty. Furthermore, through exploring Shadojis around the world, a community will be built for people who share the same concern and to give them the chance to come together to challenge the social standard of beauty.

REFERENCES

[1] Patricia Buckley Ebrey. 1999. *The Cambridge Illustrated History of China*. Cambridge University Press, Cambridge.
[2] Umberto Eco. 2004. *History of Beauty*. Rizzoli.
[3] Hannah Jewell. 2014. The BuzzFeed Body Image Survey 2014. *BuzzFeed*. Retrieved December 24, 2018 from https://www.buzzfeed.com/hannahjewell/the-buzzfeed-body-image-survey.
[4] Freedom Leung, Sharon Lam, and Sherrien Sze. 2001. Cultural Expectations of Thinness in Chinese Women. *Eating Disorders*, 9 (4), 339–350.
[5] Sarah E Lowery, Sharon E. Robinson Kurpius, Christie Befort, et al. 2005. Body Image, Self-Esteem, and Health-Related Behaviors Among Male and Female First Year College Students. *Journal of College Student Development*, 46 (6), 612–623.
[6] Mayra B. C. Maymone, Hind H. Neamah, Eric A. Secemsky, Roopal V. Kundu, Dana Saade, and Neelam A. Vashi. 2017. The Most Beautiful People: Evolving Standards of Beauty. *JAMA Dermatology*, 153 (12), 1327–1329.
[7] RM Puhl and JA DePierre. 2012. Appearance Discrimination and the Law. Elsevier Inc.
[8] J. A. O'Dea. 2012. Body image and self-esteem. *Encyclopedia of body image and human appearance*, 1, 141–147.
[9] Sandy Q. Qu and John Dumay. 2011. The qualitative research interview. Q*ualitative Research in Accounting & Management*, 8 (3), 238-264. https://doi.org/10.1108/11766091111162070
[10] RM Sentilles and K Callahan. 2012. Beauty over the Centuries – Female. Elsevier Inc.
[11] Raymond Scupin. 1997. The KJ Method: A Technique for Analyzing Data Derived from Japanese Ethnology | Human Organization. *Human Organization*, 56 (2), 233–237.
[12] Judith M. Siegel, Antronette K. Yancey, Carol S. Aneshensel, and Roberleigh Schuler. 1999. Body image, perceived pubertal timing, and adolescent mental health. *Journal of Adolescent Health*, 25 (2), 155–165.
[13] Tracy L. Tylka and Nichole L. Wood-Barcalow. 2015. What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image*, 14, 118–129.