My Mirror- A Tool to Support Self-awareness

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Abstract. Studying different aspects of self such as self-awareness and self-reflection in the area of HCI is still growing. In this study we focus on the mirror as one of the main sources of self-information. We present a process of design research that we conducted to redesign the mirror and develop a low fidelity prototype of *My Mirror*, a tool to support self-awareness by triggering individuals' inner-speech.

Keywords: Design Research, Prototyping, Self-awareness, Self-talk, Inner-speech, Self-knowledge.

1 Introduction

Self-awareness occurs when one takes oneself as the object of one's own attention and actively identifies processes, and stores information about self [1]. One becomes self-aware through engaging in self-talk [2]. Self-talk or inner speech makes one be able to verbally identify, process and store self-information [3]. The mirror is one of the main physical devices that may trigger inner-speech as one gets exposed to it and can be used as a source of self-information [3]. In this study, we redesigned the mirror, through the use of design research methods, in order to trigger individuals' inner-speech and facilitate the process of gaining self-information that may eventually lead to self-reflection and improving self-knowledge. In this paper, we first provide a short background on self-awareness and technologies that support self-talk and self-reflection; then we present the user-centered design process that we conducted to develop a low fidelity prototype of *My Mirror* as a tool to support self-awareness and self-reflection. Finally, we discuss the results of our usability test and conclude with a final discussion and future works.

2 Background

Mirror is one of the more common physical stimuli that is likely to trigger self-talk when one gets exposed to it [3]; for example "I look very good today!" or "I am so huge!" Exposing to a mirror and engaging in self-talk can lead to self-information collection, reflection and eventually self-knowledge improvement. One's level of

self-knowledge depends on the frequency, quantity and quality of self-information that one gains through this process [4].

Currently, personal informatics and designing systems to support self-awareness and improve self-reflection is growing. However, focus on physical stimuli to trigger self-reflection has received limited attention in this area.

In their studies, Andrés del Valle and Opalach [5] present their design process of the persuasive mirror, a tool to visualize continuous feedback on the behavioral data of users and support them in reaching their personal goals. However, our study takes a holistic view on different usages of a mirror and the user-centered design process of developing *My Mirror*, as a tool to provide different self-information for users, support self-reflection, and persuade them to engage in a positive self-talk.

3 Data Analysis

We conducted semi-structured interviews and a diary study to identify and state the main problem, establish the requirements, and develop our design concepts.

3.1 Interview Analysis

Semi-structured interviews were conducted with eight participants, five females and three males, within an age range of 22-30 and the mean of 26.4 years. We started interviews with simple questions that centered around participants use of mirrors, including how often and why participants interacted with this object and how it might trigger self-talk and help them gain self-information. We probed participants to tell us more until no relevant information was forthcoming.

Based on the result of interview analysis, we identified that the mirror triggers participants' self-talk and provides them with self-information, which eventually may affect their feelings and mood. However, different factors such as personality traits, mood, self-esteem, or available time mediate this process. This result helped us to finalize the focus of our project on the following problem statement: "How can we redesign a mirror to provide self-information that users need and trigger positive self-talk while they are exposed to this object?"

3.2 Diary Study Analysis

A diary study was used as the second method of data analysis to gather information and establish requirements for the problem statement identified above. To carry out this research method, we had eight participants, all were students, four female and four males with an age range of 23-28 and a mean of 24.1 years. Each participant was asked to record their answers to a set of questions immediately following any exposure to a mirror during one full day. The following are some of the questions that were asked: What time/why/where did you get exposed to the mirror? How were you feeling before/after seeing yourself in the mirror?

An affinity diagram was used to analyze the data collected in this stage and enabled the identification of three themes: physical appearance, self-encouragement or positive self-talk, and fun.

Physical Appearance

Participants reported that they check their physical appearance, such as weight, skin, or their outfits in the mirror. For example, participants documented saying the following, “I checked if my skin got better than yesterday,” “I brushed my teeth and made sure my teeth are clean.”

Self-encouragement and Positive Self-talk

Participants also reported that they sometimes encourage themselves and enhance their self-confidence in front of the mirror. For example, a couple participants said, “Sometimes when I have a talk at school, I encourage myself in the mirror before that!” “I enjoy seeing myself in the mirror specially when I look good in a nice outfit.”

Fun

Having fun is the third category identified from data in this stage. Participants reported that they sometime entertain themselves in the mirror. For example, one participant said, “I was bored and the music was on, so I started singing and dancing in front of the mirror.”

4 Prototyping

In this section we focus on the design process and explain how understanding the users based on the literature review, interview analysis, and diary study inspired us to develop a low fidelity prototype of *My Mirror*. This tool provides the user with required self-information, supports positive self-talk positive and attempts to elicit a positive mood. We discuss our design strategies based on three design concepts we identified from our data analysis in the previous section.

4.1 Physical Appearance

My Mirror provides users with their basic appearance information such as weight, size, and skin conditions. Users can also track their information in the specific time frames of a week, month and year. They can also get some health suggestions and recommendations based on their information. (Fig. 1.)

Fig. 1. Providing self-information, health recommendation, and self-encouragement

Fig. 2. Supporting positive self-talk

Fig. 3. Supporting entertainment

4.2 Self-encouragement and Positive Self-talk

We also explored different designed ideas to trigger positive self-talk and self-encouragement. Any improvement of users in different aspects of physical appearance would be encouraged by positive statements on the mirror to increase users' self-confidence. *My Mirror* also encourages users to follow different health recommendations that it provides for users. Participants also reported that they enjoyed getting engaged in a positive self-talk while seeing themselves in the mirror. To address this requirement, we designed a game in which we provide users with different positive emoticons, words and symbols and they can make positive statements describing themselves. *My Mirror* also provides users with self-motivating statements (e.g. "you are ...") and users need to fill in the blank from limited number of positive words (e.g. "cool, kind, nice, or awesome"). (Fig. 2.)

4.3 Fun

To address the desire for fun, *My Mirror* also supports users' entertainment needs. Participants reported that they sometime sing and dance in front of the mirror. *My mirror* can detect the song which users start singing and provide an audio or video of the singer on the mirror so that users can sing, dance, and have fun. Changing the environment is another strategy that *My Mirror* applies to entertain users (Fig. 3.).

For example, a user can hold up a picture of the desired environment, graphics, or shade and My Mirror would reflect that picture by changing its background based on the image.

5 User Evaluation and Conclusion

Usability evaluation was conducted with five users. Users were provided with instructions to interact with the low fidelity prototype through three main scenarios and five tasks. Tasks included exploring different physical self-information, playing around with different games and practices for positive self-talk, and having fun by singing, dancing, and changing the background. Results of the usability tests were positive about the use of My Mirror as a tool to support positive self-talk and provide relevant self-information. However, participants reported difficulties in interacting with low fidelity prototype. They also reported privacy issues being that it was challenging for them to express their actual feeling in front of the mirror in the presence of a usability expert.

To conclude, this study was more focused on exploring design ideas to redesign the mirror as one of the main sources of self-information. The plan for future studies is to develop a high fidelity prototype that users can interact with in a personal context, without the presence of a usability expert during a long period of time and to evaluate whether this tool can help users improve their self-knowledge in the long term.

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