Constructing my Online Self: Avatars that Increase Self-focused Attention

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ABSTRACT
Three studies investigated whether users' strategies for customising online avatars increase their self-focused attention, also known as private self-awareness. Study 1 showed that a high number of users adapt their avatars to reflect their own appearance. Study 2 demonstrated that users who perceive their avatars to be similar to their own appearance experience as a result heightened private self-awareness. In Study 3, private self-awareness pervaded social interaction taking place over time when users with representative avatars, compared to a control group, reported increased private self-awareness. Drawing from research in interpersonal communication, we suggest that avatars which increase their owners' self-focus may have an influence on online behavior in the context of social computing.

Author Keywords
Avatars, self-awareness, interpersonal communication

ACM Classification Keywords
H1. Models and Principles: User/Machine Systems

INTRODUCTION
Self-awareness is a two faceted phenomenon that relates to human behavior in two different ways [2]. The *private facet of self-awareness* is the awareness directed towards the self [2] and is increased with attentional cues (e.g. mirrors) [4]. When privately self-aware, one is able to reflect more on one's attitudes, standards [2] and emotional states [6]. As such, in interpersonal communication private self-awareness is more likely to increase self-disclosure, for example [3]. The *public facet of self-awareness* is the awareness experienced when one perceives the self as a social object [2] and it is increased with cues of accountability (e.g. identifying photographs) [4]. When publicly self-aware, one is concerned with being evaluated by others. As such, people who are more publicly self-aware tend to gravitate towards the opinions of others [5].

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The pivotal role of self-awareness in shaping interpersonal communication has motivated researchers in computer-mediated communication (CMC) to begin linking the affordances of CMC environments to self-awareness, and in turn to online behavior [3]. In the course of this work, it has been shown that online private and public self-awareness can each be manipulated by a different set of environmental features, such as the lighting of the room, or by changing different attributes of the technology used, such as anonymity or rich media (e.g. [3], [9]). Researchers' success in manipulating self-awareness in CMC suggests that in real world settings some environments (both physical and as designed) may discourage self-awareness, while others may encourage it. Still, more extensive work is needed to better understand the deterring or encouraging attributes of CMC environments on self-awareness. To that effect, the present paper focuses on the private aspect of self-awareness by investigating its existence in a social computing setting that allows users to create avatars to represent themselves.

Animated avatars have become widespread in online gaming, such as 'Second Life', 'SIMS' or the 'Xbox'. In contrast, the adoption of avatars in social computing platforms, such as chatting or online communities, has been relatively slower. Photographs have been the primary media for representing online users and have thus received the most attention (for an overview see [7]). Avatars have been conceptualized as a symbolic artifact of the face for mediated-communication [1] but until recently their commercial application was limited. However, uptake has been rapid since Yahoo! integrated avatars in their social computing services in 2004. Over 7 million users have constructed a Yahoo! Avatar that is displayed across a wide range of applications (e.g. Yahoo! Answers, Yahoo! Message Boards). Contrary to an anonymous online identity, avatars emit individuating properties back to their owners and outwards to the community. Yet, it is unclear how these properties are perceived and whether they may ultimately affect online behavior. Motivated by the role of private self-awareness in interpersonal communication, we investigate the use and perception of an avatar by its owner, and the subsequent impact on self-awareness.

Three complementary studies are presented that address this topic. It is first suggested that users of social computing are inclined to customize avatars by using their physical appearance as a guide. In a social computing environment

that is centered on discussion and self-expression, users may be more apt to design an avatar that renders their own image. Study 1 sets out investigate this possibility. Furthermore, it is argued that avatars have the ability to increase private self-awareness. Traditional lab studies use mirrors as a device for bringing focus on the self: a participant who sees himself or herself in a self-reflective surface will experience higher private self-awareness. Similarly, a user who has customized an animated avatar to portray his or her own physical characteristics and personal preferences may perceive their avatar onscreen in the same way as a self-reflection in a mirror. Study 2 investigates whether users who tend to customize their avatar to look like themselves experience higher private self-awareness opposed to those who choose a non-representative avatar. Study 3 examines whether private self-awareness, as increased by an avatar that is representative to its user, permeates into social interaction.

STUDY 1

Study 1 investigated whether online users who construct avatars for use in social computing do so by customizing their avatar according to their physical appearance and personal preferences. In a social computing environment, users often branch out to their social networks, while discussing topics that are centered on real life issues. It was thus expected that a large number of social computing users would choose avatars that closely resemble themselves rather than taking on another persona.

Overview

The user sample for this study was identified through two social computing platforms, Yahoo! Answers and Yahoo! 360°. At first, we visited Yahoo! Answers and identified users who were represented by a Yahoo! Avatar. To obtain a diverse sample, we branched out from Yahoo's regional sites in Canada, Australia, Spain, India, Brazil, Argentina, Mexico, Italy, France and Germany. Next, it was determined whether the selected users had a Yahoo! 360° page. Among the different features that Yahoo! 360° offers (e.g. Blogs, social networking tools), users can construct their identity by directly uploading their personal photographs into the tool and also linking in their avatar, created in a separate process with the Yahoo! Avatars interface. Therefore, Yahoo! 360° pages provided us with a platform for collecting avatars and corresponding photographs of their owners. Only users who displayed both their avatar and photograph were kept in the final sample resulting in a total of 85 sample profiles (53 profiles were female and 32 were male). Figure 1 displays an example of such a profile.

Figure 1. Profile example.

Eight participants, naïve to the purposes of this study, rated the 85 profiles. Participants were presented with the profiles one at a time and were asked to rate the similarity between the photograph and the avatar from a scale of 10 (high) to 1 (low). Participants were instructed to use any cues available from the photographs to reach their decision. Yahoo! Avatars offer limited options for face features. Participants were asked to keep this in mind when reaching their decision. The order of the profiles was counterbalanced to minimize order effects.

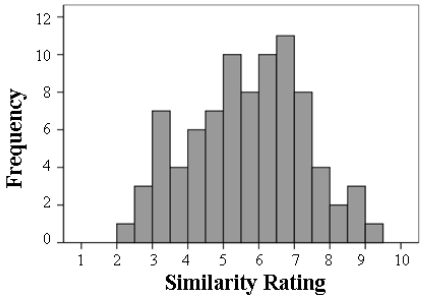

Figure 2. Frequency of mean similarity ratings.

Results and discussion

Inter-rater reliability was high (Cronbach's alpha = 0.86). We therefore report the mean scores of the combined raters. These scores revealed that users tended to customize their avatar to fit more closely to their physical appearance. Over half of the profiles (47 in total or 55%) were given a rating above 5.5, the median of the scale. Figure 2 displays the frequency distribution of mean similarity ratings.

We began with the premise that users of social computing might customize their avatars to represent their appearance and personal preferences more closely. More than half of the users in the sample evaluated were rated above the median similarity score. Moreover, none of the users chose a gender opposite to their own. Although the sample collected for this study was diverse in gender and ethnicity, such a small sample cannot be generalized to the preferences of all online users. Additionally, social computing users who include a photograph in their profile might be more likely to develop a self-representative avatar. Nonetheless, this result emphasizes the need to begin understanding how users perceive avatars that reflect their own appearance.

STUDY 2

Study 2 addressed whether users who customize avatars to reflect their own appearance experience increased private self-awareness in comparison to users who create avatars unlike themselves. Avatars are often displayed on the screen's focal area. We suggest that in this kind of setup users who believe their avatar resembles their appearance may perceive their onscreen representation similarly to their self-reflection in a mirror, therefore experiencing heightened private self-awareness.

Overview

A total of 29 participants took part in Study 2. Sessions took place in a quiet room. Participants were led to believe they were participating in a study about creativity and spontaneity involving two unrelated web tasks. In the first task, participants constructed an avatar using the Yahoo! Avatars tool. There was no directive given for this task i.e. users could construct any kind of avatar. Upon completing the first task, participants filled out an online questionnaire. The experimenter ensured that the questionnaire window did not conceal the avatar from task one. Participants were left alone while conducting both tasks.

Measures

Three measures were collected in the second questionnaire task and are discussed in the order they were answered:

State private self-awareness. Private self-awareness is often measured indirectly with a 'linguistic implications form' [8]. This questionnaire contains 20 sentences each of which is missing one word. Three options, equally valid, are provided for filling in the blank for each sentence. Five questions measure private self-awareness by providing pronoun choices (e.g. I vs. they, she) while the remaining 15 sentences are fillers. When attention is focused on the self, one is more likely to use personal pronouns e.g. me, rather than collective pronouns or non self-relevant words. In this study, private self-awareness was measured immediately after the avatar task with this method, using a set of previously validated questions [8].

Reported similarity. Participants were asked to rate the similarity of the avatar they created in the first task to their own appearance from a scale of high (10) to low (1).

Trait private self-awareness. Self-awareness is a state but also a trait. Thus, reports of increased self-awareness can be partly due to one's personality. A ten-point measure developed and validated by [2] was used for trait private self-awareness to control for this possible confound.

Results and Discussion

A partial correlation was chosen to analyze the data with two dependent variables, *reported similarity* and *state private self-awareness*. *Trait self-awareness* was used as a control variable to ensure that peoples' dispositional tendency to be self-aware did not confound the results. The correlation of avatar similarity with private self-awareness was significant (r (26) = 0.46; p = 0.007). As expected, the correlation was in a positive direction so that those who felt their avatar was more similar to their own appearance were more self-aware.

STUDY 3

Study 2 focused on the customization of avatars *only* by giving users an open ended customization task. It was demonstrated that users who selected more self-representative avatars experienced higher private self-awareness, irrespective of their dispositional tendency to be self-aware. Study 3 takes this result forward and sets out to discover whether the same findings persist in a computer-mediated communication setting. The design of Study 3 controlled for avatar similarity; given the substantiating result of Study 2, trait self-awareness was not addressed. Upon interacting online with another person, participants whose *similar avatar* was displayed onscreen were expected to report higher private self-awareness than a control group *without an avatar representation*.

Overview

The study conducted was a between-subjects design with two conditions: participants had either a representative avatar onscreen or had no avatar representation. Participants played a social dilemma game with another player via a web application. In this paper, we report participants' self-awareness scores after the game *only*. Upon arriving, a participant was led to a quiet room and seated by a computer. Each participant received the game instructions separately and played two rounds of the game in total.

Forty-six participants took part in this study out of which forty participants' data was kept for analysis[1]. Twenty participants were randomly assigned to each of the two conditions. In both conditions, the experiment room was faintly lit. Participants were instructed to construct a pseudonym for their participation. Low lighting and anonymity together have been used in previous CMC studies to decrease public self-awareness [3]. The aim was to ensure that public self-awareness remained low across all conditions, and did not confound the impact of the private self-awareness manipulation.

In the *control* condition, participants were treated with the low public self-awareness manipulations. This condition served as a baseline of private self-awareness.

In the *avatar* condition, participants were treated identically to those in the control condition, except that participants were then given an avatar application comparable to Yahoo! Avatars. Participants were asked to customize an avatar to reflect their physical appearance (e.g. color of eyes, hair and skin) and their personal preferences (e.g. backdrop image). For example, participants were urged to use clothing patterns and colors they would wear in real life. Similarly, participants were asked to choose backdrops for their avatar of a place they have been to or are planning to go to. The backdrops provided in the application included a beach, classroom, downtown scene and tropical background. Participants were told that the avatar would be visible only to them. The avatar was displayed onscreen throughout the game.

[1] After completing the experiment, participants in the avatar condition were asked to report their similarity to their avatar. Six participants who reported low similarity were excluded and replaced with six new participants.

Measures

Users' reported self-awareness was collected after each of two rounds in the game. Because of this, a more concise measure suitable for repeated administration was used. After each round of the game, participants completed a short questionnaire that has been successfully used in previous CMC experiments as a measure of self-awareness (e.g. [3]). Two questionnaire items measured private self-awareness from high (5) to low (1): "In this experiment I've generally been very aware of myself, my own perspective and attitudes" and "Rather than thinking about myself in this experiment, my mind has been distracted by my task and what is going on around me". The second question was reverse scored.

Results and Discussion

A two-way analysis of variance with two levels of private self-awareness (*avatar, control*) and two levels of rounds-played (*round 1, round 2*) showed a significant main effect of condition on private self-awareness across the two rounds ($F(1,76) = 9.89$; $p=.002$). The main effect of rounds-played ($F(1,76) = .044$; $p=.8$), and the interaction effect was non-significant ($F(1,76) =.24$; $p=.62$). Figure 3 displays the mean self-awareness score for each round. Participants in the avatar condition reported higher private self-awareness in both rounds of the game.

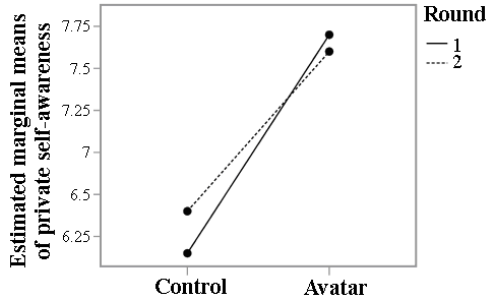

Figure 3. Means of self-awareness reports.

As postulated, avatars customized according to their owners' appearance and preferences, in contrast to a control group, increased participants' private self-awareness during their online interaction with another player. Therefore, self-awareness as induced by an avatar has the ability to pervade online communication. Even more, participants in the avatar treatment reported higher private self-awareness in both rounds of the game. Therefore, the customization that preceded the first round did not solely increase participants' private self-awareness. Rather, the increase in self-awareness can be further explained by the presence of the avatar onscreen. Even so, it is possible that the identification required for a user to experience heightened private self-awareness may diminish over time if users do not tend to their avatar on a regular basis. Constant updating may be needed to reflect users' preferences and feelings at a particular time.

CONCLUSIONS

Although many CMC environments are anonymous, individuating information, such as avatars, can be often transmitted. The results of the present research show that users who subscribe to certain social systems (e.g. Yahoo!) have a tendency to customize their avatars according to their own appearance. Crucially, this kind of customization was associated with increases in users' private self-awareness. Although the present paper focuses on the impact of avatars on private self-awareness, the results have a number of implications for interpersonal communication online. For instance, heightened private self-awareness in CMC has been shown to increase self-disclosure [3]. Consequently, avatars may have the potential to enrich interpersonal communication by allowing online members to engage in more intimate, meaningful conversations that support stronger interpersonal bonds. Conversely, users may disclose inappropriate information that leads to the communication breaking down. Future work might consider linking avatars and the subsequent increase in private self-awareness to online interpersonal communication.

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REFERENCES

1. Donath, J. (2001). Mediated Faces. *Proceedings of the 4th International Conference, CI 2001*, Warwick, UK.
2. Fenigstein, A, Scheier, M. F. and Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology* 43, pp. 522-527.
3. Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology* 31, pp. 177-192.
4. Prentice-Dunn, S. and Rogers, R. W. (1982). Effects of public and private self-awareness on deindividuation and aggression. *Journal of Personality and Social Psychology* 43, pp. 503-513.
5. Scheier, M. F. (1980). Effects of public and private self-consciousness on the public expression of personal beliefs. *Journal of Personality and Social Psychology* 39 (3), pp.514-521.
6. Scheier, M. F. (1976). Self-awareness, self-consciousness, and angry aggression. *Journal of Personality* 44, pp. 627-644.
7. Walther, J. B. and Parks, M. R. (2002). Cues filtered out, cues filtered in: Computer-mediated communication and relationships. In M. L. Knapp and J. A. Daly. *Handbook of interpersonal communication* (pp. 529-563). Thousand Oaks, CA: Sage.
8. Wegner, D. M., & Giuliano, T. (1980). Arousal-induced attention to self. *Journal of Personality and Social Psychology* 38, pp. 719-726.
9. Yao, Z. M. and Flanagin, A. J. (2006). A self-awareness approach to computer-mediated communication. *Computers in Human Behavior* 22, pp. 518-544.