Journal ofVirtual Worlds Research

vwresearch.org ISSN: 1941-8477



Metaverse Assembled 2.0

July 2011

Volume 4, Number 1 Metaverse Assembled 2.0 July 2011

Editor-in-Chief Jeremiah Spence

Managing Editor Yesha Sivan

Guest Editors

Kathy Keeling, University of
Manchester, UK

Nadia Papamichail, University of

Manchester, UK

Debbie Keeling, University of Manchester, UK

Enchi (Katherine) Chang, University of Manchester, UK

This issue includes papers from the SLACTIONS 2010 Conference organized by Kathy Keeling and her colleagues at the University of Manchester.

Technical Staff Betsy Campbell





The Journal of Virtual Worlds Research is owned and published by the Virtual Worlds Institute, Inc. – Austin, Texas, USA. The JVWR is an academic journal. As such, it is dedicated to the open exchange of information. For this reason, JVWR is freely available to individuals and institutions. Copies of this journal or articles in this journal may be distributed for research or educational purposes only free of charge and without permission. However, the JVWR does not grant permission for use of any content in advertisements or advertising supplements or in any manner that would imply an endorsement of any product or service. All uses beyond research or educational purposes require the written permission of the JVWR. Authors who publish in the Journal of Virtual Worlds Research will release their articles under the Creative Commons Attribution No Derivative Works 3.0 United States (cc-by-nd) license. The Journal of Virtual Worlds Research is funded by its sponsors and contributions from readers.



Volume 4, Number 1 Metaverse Assembled 2.0 July 2011

Actual Self vs. Avatar Self: The Effect of Online Social Situation on Self-Expression

Yongjun Sung, University of Texas at Austin Jang Ho Moon, mihyun Kang, Jhih-Syuan Lin

Abstract:

This paper investigates whether online social contexts can prime individuals to create avatars that emphasize particular characteristics and personality traits that are different from their actual selves. The results show that while the participants' avatar personality ratings are correlated with their own personality ratings across the Big-Five personality dimensions, they still try to express personality characteristics that are somewhat different from their actual selves in virtual environment. Further, with respect to the relationship between avatar personality ratings (given by creators) and those by zero-acquaintances, no significant relationships were observed (with the exception of the Agreeableness dimension).

Keywords: avatar, self, Big-Five personality, virtual environment

Actual Self vs. Avatar Self: The Effect of Online Social Situation on Self-Expression

Yongjun Sung, University of Texas at Austin Jang Ho Moon, mihyun Kang, Jhih-Syuan Lin

The recent surge in popularity of online environments opens up new doors as such virtual worlds are not built for merely one specific purpose and support a wide range of activities similar to those of the real world. These virtual worlds have become a cyber hangout place for people wherein they engage in a multitude of social activities with no geographic or time constraints. Currently, various online venues offer a creative platform for identity construction and an opportunity to interact with other people (Vasalou & Joinson, 2009). Such online environments have been widely recognized as social places where people are able to explore one or many selfidentities that may be extrapolated or different from their real selves (Joinson & Dietz-Uhler, 2002). This opportunity to have multiplicity of self in online environments can be strengthened even more by adopting an avatar, which is "a general graphic representation that is personified by means of computer technology" (Holzwarth, Janiszewski, & Neumann, 2006, p. 20), or put more simply, a graphic representation of the user.

Indeed, the avatar-creation process involves a variety of identity creation processes (e.g., gender, age, ethnicity, outfit, accessary, and some personality characteristics such as facial expression) (Bessière, Seay, & Kiesler, 2007; Lawson, 2000). Therefore, investigating how individuals imbue avatars with personalities is a key issue in cyber psychology (Guitton, 2010). The objective of this study is to test whether and to what extent online social contexts influence the self-concept in virtual environment. Indeed, a recent study by Vasalou and Joinson (2009) investigates how individuals customize avatars for self-presentation purpose in different online settings (e.g., blogging, gaming). Their findings from both quantitative and qualitative data show that participants tend to create self-reflective and self-representative avatars regardless of the online context (Vasalou & Joinson, 2009).

The current study extends these previous findings by employing the Big Five Inventory (BFI) which is a self-report inventory designed to measure the five personality dimensions: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. More specifically, this research employs the BFI and its 44 personality traits to examine the level of agreement between individuals' actual selves (i.e., evaluation of themselves) and avatar selves (i.e.

evaluation of their avatars). Further, the current study tests the relative impact of the different virtual social contexts in determining the level of self-avatar agreement. That is, this research tests whether different social contexts can prime individuals to create avatars that emphasize particular characteristics and personality traits that are similar to or different from their actual selves. Finally, while prior social psychology and personality research shows that self-report of personality traits is significantly correlated with those rated by zero-acquaintances (e.g., Albright, Kenny, & Malloy, 1988; Borkenau & Liebler, 1992, 1993; Watson, 1989), limited research has tapped into this issue in the context of virtual environments wherein people interact with others via their customized avatars. Thus, this research explores the level of self-other agreement of personality perception of the avatar.

Correlation between Self and Avatar

Although there have been many studies examining the influence of an avatar's appearance on users' behavior (e.g., Yee & Bailenson, 2007) and individuals' judgments of the avatar with whom they interact (e.g., Nowak, 2004), relatively limited research has been conducted to understand how users create their own avatars. It has been conjectured that individuals try to create their avatars realistically and carefully choose the images of their avatars to represent the characteristics essential to their own identities (Schroeder, 2002; Taylor, 2002). For example, Nowak and Rauh (2005) reported that people tend to prefer avatars that are aligned with their own gender and type (anthropomorphic) and choose avatars featuring characteristics that are similar to their own. Messinger et al. (2008) also found that although users want to add some physical enhancements (e.g., attractiveness), they try to make their avatars similar to themselves. Interestingly, while users are likely to experiment with their virtual appearances, they are less likely to change their avatar's personality (Ducheneaut, Wen, & Wadley, 2009).

While prior research suggests that personality differences between users and avatars do exist, such differences are small and even possibly disappear over time (Ducheneaut et al., 2009). Moreover, people with large personality discrepancies reported less satisfaction with their avatar than those with smaller differences (Ducheneaut et al., 2009). In addition, in online dating contexts, although participants lied and projected an enhanced view of themselves on their profiles, the actual difference between their real and virtual selves remained small (Hancock, Toma, & Ellison, 2007). In sum, prior literature suggests that individuals' self-expressions in

online environments are largely based on their actual selves in real life. Thus, the following hypothesis is put forth:

H1: Individuals' avatar personality ratings will be correlated with their own personality ratings across the Big-Five personality dimensions.

Stable vs. Malleable Self-Concept

In the self-concept literature, the self has been regarded as a configuration of personality characteristics that is relatively stable and consistent across social situations (Markus & Kunda, 1986). Early social psychologists suggested that individuals strive to resolve inconsistent psychological experiences and try to develop and maintain a consistent identity (e.g., Lecky, 1945; Rogers, 1961). Trait personality theorists have also suggested that individuals are assumed to possess personality dispositions that are relatively stable, consistent, and expressed over time, situations, and social roles (Mischel, 1998). Previous empirical studies found that individuals tend to ignore or reject views or behaviors which are discrepant from their own self-concepts (e.g., Greenwald, 1980; Rosenberg, 1979). For example, Swann and colleagues revealed that individuals try to verify their self-conceptions in different social environments and interact with others and provide feedback that is congruent with their self-concepts (Swann, 1983; Swann & Read, 1981).

It is also acknowledged that the self-concept is not a fixed and monolithic entity. Instead, it is a dynamic structure that encompasses a variety of self-conceptions (i.e., the actual, ideal, ought, possible, feared, and hoped-for selves) resulting from interaction with the social environments and contexts (Higgins, 1987; Markus & Kunda, 1986; Markus & Wurf, 1987). Individuals do not always dispose themselves in accord with their stable selves or personality traits. Rather, they change their attitudes or behaviors from context to context (Markus & Wurf, 1987). Markus and Kunda (1986) argued that different selves appear to emerge in different social contexts and situations (called *the malleable self-concept*). Based on this malleable self-concept, Markus and Kunda (1986, p. 859) proposed that "although the self-concept is in some respects quite stable, this stability can mask significant local variations that arise when the individual responds systematically to events in the social environment." This perspective on self-concept suggests that the self should be viewed as more contextual and dynamic, further suggesting that

the self is a product of specific situations (Funder, 1983; Jackson & Paunonen, 1985; Mischel & Peake, 1982).

In this study, it is assumed that although the self-concept is viewed as a somewhat stable and enduring perception of the self at any given moment, this stability can be changed or varied when individuals react and respond to a variety of social situations (Markus & Kunda, 1986). Thus, based on the perspective of the malleable self-concept, it is predicted that in a variety of online social contexts, individuals will present avatar selves that are somewhat different from their actual selves that are matched to situational cues. Thus, the following hypothesis is proposed:

H2: Individuals' avatar personality ratings will be different from their own personality ratings across the Big-Five personality dimensions.

Personality Judgments Based on Physical Appearance

Prior research in personality and social psychology consistently posits that the agreement of personality judgment between an individual and another person is generally high (e.g., higher than .40 correlation) across a wide range of personality traits (e.g., Funder, 1980). Further, such interjudge agreements tend to increase with acquaintanceship. That is, as one person interacts with another, he or she is more likely to get information about the person, thereby increasing the likelihood of predicting that person's personality accurately (Naumann, Vazire, Rentfrow, & Gosling, 2009).

In interpersonal interactions, physical appearance is one of the most powerful cues in determining others' subsequent attitude and behavior (Naumann et al., 2009). The basis of physiognomy is the belief that personality characteristics of an individual can be reflected in external physical features, in particular the face (Shevlin, Walker, Davies, Banyard, & Lewis, 2003). Past research suggests that facial features may indeed provide some useful and valid information about a person's personality and shows significant levels of both self-stranger and acquaintance-stranger agreements (Borkenau & Liebler, 1992; Kenny, 1994; Kenny, Homer, Kashy, & Chu, 1992). Further, research in zero-acquaintance judgments of personality based on the personality dimensions of the Big Five suggests that accuracy of interjudge agreement is surprisingly high, especially for the extraversion dimension (Hall, Andrzejewski, Murphy, Mast, & Feinstein, 2008; Kenny, 1994). For example, Norman and Goldberg (1966) found statistically

significant self-stranger agreement for three dimensions of the Big Five (i.e., extraversion, conscientiousness, and culture) when participants were in the same room for 20 min. Watson (1989) replicated such findings for the extraversion, agreeableness, and conscientiousness dimensions. In Borkenau and Liebler's (1992) study, researchers experimentally manipulated the amount of information available to the strangers. Targets were videotaped entering a room, walking around a table, and reading a weather forecast. Subjects in their study were assigned to one of four conditions: video with sound, video without sound, audio only, and a still extracted from the video. They then evaluated personality of the targets based on the Big Five dimensions. Overall findings of their study suggest that physical appearance provides some valid information, but accuracy increases when other verbal and nonverbal sources of information are available to observers (Borkenau & Liebler, 1992).

However, many past zero-acquaintance studies have been conducted under brief face-toface interactions or video-taped behaviors varying information (e.g., Albright, Kenny, & Malloy, 1988; Borkenau & Liebler, 1992, 1993; Watson, 1989). While some studies have examined the accuracy of personality judgments based on photographs alone and found substantial accuracy for some traits (e.g., Berry & Finch-Wero, 1993, Rind & Gaudet, 1993; Robins, Gosling, & Donahue, 1997), limited empirical research has been conducted in the context of virtual environments such as blogs, online social networks, and gaming sites wherein avatars are increasingly common and used as a critical personality judgment cue in many non-face-to-face contexts. The current study extends the previous results of past zero-acquaintance studies in the personality literature by investigating the accuracy of personality judgments at absolute zeroacquaintance--judgments based on avatar appearance. Thus, we pose an exploratory research question:

RQ1: What is the extent of personality evaluation agreement between an avatar's creator and a zero-acquaintance based on avatar appearance?

Method

The current study consisted of three parts. In Part I, participants self-reported their personality traits based on the Big Five Inventory (BFI). Three weeks later, the same participants were invited to create an avatar and rate his/her avatar personality based on the BFI (Part II).

Finally, an independent group of subjects (zero-acquaintances) in Part III rated a set of 24 avatars created by others in Part II.

Participants

A total of 300 undergraduate students (224 female, age M = 20.2) from a large southeastern university in the U.S. participated in the study in exchange for course credit. The sample consisted of 61% Caucasians, 16% Hispanics, 9.3% Asian Americans, and 4.7% African Americans, and 9.0% other. Among them, 202 students (156 female, M = 20.3) participated in both Parts I and II. In part III, an independent group of 98 students (68 female, M = 20.1) were recruited.

Conditions and Stimuli

To increase the generalizability of the findings, four distinct online social contexts were selected for the present study: social network (SN), brand community (BC), virtual class (VC), and online game (OG). To successfully prime hypothetical online social environments, four different vignettes were developed. One sample vignette is presented below:

Brand Community (BC): Please imagine that you've joined your favorite online brand community (e.g., PINK fan site or iPhone fan site in Facebook). As this is an avatarbased online community, it requires community members to create their own highly customized avatars to represent themselves online. So, you have to create an avatar as part of your profile. You will use your customized avatar to communicate with other community members to share brand experience and information, solve problems, and meet peer consumers and company representatives online. The community members have their own avatars and interact with each other through avatars.

Procedure and Measures

Part I. First, to reduce the possibility of demand effects, actual self-concept was measured three weeks prior to the main experiment. After informed consent was obtained, participants were asked to complete the Big Five Inventory – 44 traits for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (John, Donahue, & Kentle,

1991)—as well as demographic information. Participants rated each trait on a 5-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree." Reliability estimates were computed for the set of traits to measure each of the five personality dimensions. All alphas ranged between .75 and .87.

Part II. Three weeks later, the participants were invited again. Upon arrival, they were randomly assigned to one of the four experimental conditions (Social Network = 51, Brand Community = 51, Virtual Class = 49, and Online Game = 51). After reading brief instructions, participants were asked to imagine that they need to create an avatar for their designated social contexts. Participants created an avatar by using the "Face Your Manga" Web site (http://faceyourmanga.com). After avatar creation, they were asked to provide demographic information about the avatar (i.e., avatar's name, gender, race, age, and job) and rate their avatar by using the BFI. When answering the questions, participants' avatars were still visible on the screen. Reliability estimates were computed for the set of traits to measure each of the five personality dimensions, ranging between .77 and .87. Of the 202 avatars created, screenshots of 24 avatars were randomly selected and saved for the additional data collection.

Part III. Finally, to assess avatar personality among zero-acquaintances, an independent group of 98 students were invited. They were asked to rate one of the 24 randomly selected avatars that were created in the previous stage. Each avatar was rated by 4-5 participants and their ratings were averaged to form the avatar personality evaluation from zero-acquaintances.

Results

Descriptive Analyses

The discrepancies between the actual self (Part I) and the avatar self (Part II) were first examined descriptively. The subject's self-reported gender, age, ethnicity, and occupation were compared with those of the avatars they created. Our analyses showed 98.5% gender, 87.1% ethnicity, 62.9% age, and 51% occupation matches between the actual self and the avatar self. Next, we examined the effects of online social contexts on their responses to the question about the avatars' occupations as approximately 50% of the subjects showed discrepancies. In the VC condition, the majority of the subjects indicated that the occupation of the avatar was student (79.6%), followed by SN (76.5%), OG (56.9%), and BC (47.1%). In the BC condition, a variety of occupations such as designer, artist, art director, and musician were listed. Approximately

12% of the subjects in the OG condition listed somewhat rugged and tough jobs (e.g., mobster, bandit, and tattoo artist).

Correlation Analyses

To test our prediction that participants' self-reported personality ratings would correlate with their avatar personality ratings (H1), we calculated correlation coefficients between the actual personality (Part I) and the avatar personality (Part II) across the Big Five personality dimensions. These coefficients are presented in Table 1. As predicted, significant correlations were observed across the five dimensions: Extraversion (r = .56, p < .001), Agreeableness (r = .48, p < .001), Conscientiousness (r = .48, p < .001), Neuroticism (r = .45, p < .001), and Openness (r = .56, p < .001). Next, to answer our proposed research question (RQ1), we correlated the creators' own avatar personality rating (Part II) with those by zero-acquaintances (Part III). For four of the five dimensions, no significant relationship was observed: Extraversion (r = .15), Conscientiousness (r = .03), Neuroticism (r = -.07), and Openness (r = -.19). However, for the Agreeableness dimension, the correlation was .44 (p < .05).

Č					v.					
	1	2	3	4	5	6	7	8	9	10
1. Actual-Extraversion	1.00									
2. Actual-Agreeableness	.16*	1.00								
3. Actual-	.18*	.13	1.00							
Conscientiousness										
4. Actual-Neuroticism	-	-	16*	1.00						
	.20*	.28*								
	*	*								
5. Actual-Openness	.04	.15*	02	07	1.00					
6. Avatar-Extraversion	.56* *	.06	.17*	04	04	1.00				
7		40*	1.6*	0.2	02	25*	1.00			
7. Avatar-Agreeableness	.11	.48* *	.16*	.03	.02	.35* *	1.00			
8. Avatar-	.06	.18*	.48*	.01	.00	.16*	.42*	1.00		
Conscientiousness	.00	.10	*	.01	.00	.10	*	1.00		
9. Avatar-Neuroticism	04	17*	12	.45*	01	_	-	_	1.00	
				*		.22*	.31*	.38*		
						*	*	*		
10. Avatar-Openness	08	.16*	.02	.09	.56*	.27*	.39*	.21*	20	1.00
•					*	*	*	*		

^{• .05; ** .001}

Table 1. Correlations between Actual Self and Avatar Self (N = 202).

Mean Analyses

To test whether virtual social contexts can prime users to create avatars emphasizing particular characteristics and personality traits that are different from their actual selves (H2), we conducted a series of ANOVAs. For each personality dimension, a single index was formed by averaging across traits. Thus, each participant was given two index scores (for the actual and avatar selves) for each of the five dimensions. Mean scores were then computed and are shown in Table 2. Note that high scores indicated greater levels. The avatar selves in the four virtual social contexts were higher than the actual selves across four personality dimensions: Extraversion, Agreeableness, Conscientiousness, and Openness. For example, regarding Agreeableness, the avatar personality ratings were higher than those of the actual self in SN (M =3.78 vs. M = 4.02), BC (M = 3.74 vs. M = 4.04), VC (M = 3.81 vs. M = 4.05), and OG (M = 3.74vs. M = 3.87). The same patterns were observed for Extraversion, Conscientiousness, and Openness (see Table 2). In contrast, as for Neuroticism, participants rated the avatar personality lower than the actual self across the four virtual social contexts (SN M = 2.92 vs. 2.34; BC M =2.96 vs. 2.35; VC M = 2.92 vs. 2.40; OG M = 2.85 vs. 2.42). Participants also showed greater variation between the actual and avatar personality on Neuroticism than on the other four dimensions.

	Actual Mea (SD)	n Avatar N (SD)	Mean t	N
SN				51
Extraversion	3.62 (.80)	4.02 (.78)	-5.65***	
Agreeableness	3.78 (.61)	4.02 (.67)	-2.56*	
Conscientiousness	3.71 (.59)	3.91 (.67)	-2.52*	
Neuroticism	2.92 (.67)	2.34 (.69)	5.89***	
Openness	3.74 (.56)	3.91 (.64)	-2.32*	
BC	, ,	, ,		51
Extraversion	3.66 (.76)	3.98 (.57)	-3.33**	
Agreeableness	3.74 (.57)	4.04 (.58)	-3.59**	
Conscientiousness	3.82 (.52)	3.94 (.62)	-1.31	
Neuroticism	2.96 (.71)	2.35 (.65)	7.29***	
Openness	3.68 (.59)	4.05 (.56)	-4.33***	
VC	, , ,	, , ,		49
Extraversion	3.71 (.73)	3.87 (.60)	-1.82	
Agreeableness	3.81 (.47)	4.05 (.53)	-3.52**	
Conscientiousness	3.66 (.65)	3.89 (.57)	-2.31*	
Neuroticism	2.92 (.68)	2.40 (.69)	4.35***	
Openness	3.77 (.62)	3.99 (.51)	-3.30**	

OG				51
Extraversion	3.64 (.71)	3.68 (.86)	37	
Agreeableness	3.74 (.62)	3.87 (.80)	-1.33	
Conscientiousness	3.71 (.58)	3.75 (.75)	51	
Neuroticism	2.85 (.69)	2.42 (.69)	4.35***	
Openness	3.79 (.57)	4.01 (.73)	-2.45*	

^{* .05: ** .01: *** .001}

Table 2. Mean scores for the actual and avatar selves on the BFI.

Next, a 2 (actual-self vs. avatar-self) × 4 (SN vs. BC vs. OG vs. VC) repeated measures ANOVA was conducted for each of the five dimensions. Social context was entered as a between-subjects factor and the self was entered as a within-subjects factor. Unless otherwise specified, the degree of freedom of ANOVA reported below was 1, 85. A 2 × 4 ANOVA yielded a significant within-subjects main effect across the five personality dimensions: FExtraversion = 23.98, p < .001; FAgreeableness = 27.35, p < .001; Fconscientiousness = 10.94, p < .001; Fneuroticism = 113.29, p < .001; Fopenness=37.97, p < .001. The results showed that the actual-self differed significantly from the avatar-self for all five personality dimensions. However, across the five personality dimensions, no main effect of social context was found (Fs < 1). Finally, the self × social context was found to be significant on Extraversion only, F(3,198) = 2.94, p < .05. As shown in Figure 1, individuals in the SN (p < .001) and BC (p < .01) conditions showed significant differences between the actual and avatar selves whereas subjects in the VC (p = .08) and OG (p = .71) conditions showed no differences.

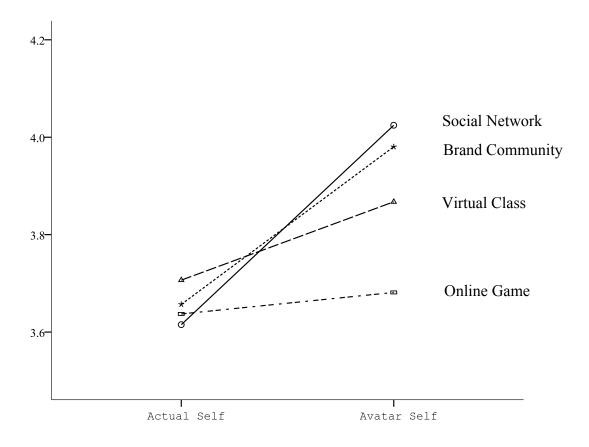


Figure 1. Actual vs. Avatar Selves (Extraversion).

Summary and Discussion

In social psychology, the self-concept provides a framework for the perception and organization of the self as well as for comprehending the thoughts, feelings, and behaviors of others (Markus, Smith, & Moreland, 1985). That is, how we perceive and understand our own and others' behaviors is particularly influenced by our own self-concept.

The current study addressed the issue concerning personality perception and self-expression in online social contexts. First, our findings suggest that an individual's occupation is the most malleable element when people create the avatar self, followed by age, ethnicity, and gender. The greatest discrepancy between actual self and avatar self in occupation implies that people may want to express more positive personality via their avatar by manipulating social roles, which have more potential to be changed in the future. Our findings are in line with those of McKenna (1999), suggesting that people tend to present more idealized images of themselves

when they meet online than in face-to-face interactions. Such discrepancies were found more frequently in virtual social contexts (i.e., brand community, online game) that are relatively anonymous environments where people interact mostly with zero-acquaintances comparing to those online venues (i.e., virtual class, social network) which require some amount of face-to-face interactions.

Further, the results of the correlation analyses showed that individuals' personality ratings are correlated with those of their avatars across the Big-Five, suggesting that the self-conceptions of the avatars were largely based on their own personality in real world. However, with respect to the relationship between avatar personality ratings (given by creators) and those by zero-acquaintances, no significant relationships were observed (with the exception of the Agreeableness dimension). Our findings may be due to the amount of information provided to zero-acquaintances. That is, there was no face-to-face interaction whatsoever (e.g., chat, typed message, email interaction, or graphic facial expression) between avatars and zero-acquaintances. Although physical appearance (i.e., avatar face) was available, still very limited information and no social interaction was presented to the subjects in Part III. In line with prior personality literature (e.g., Borkenau & Libler, 1992), our findings suggest that while physical appearance does offer some valid information about a person's personality, judgment accuracy would increase when additional information and cues are available (e.g., verbal sources, social interactions).

The results of the mean comparisons suggest that regardless of online social contexts, individuals tend to express different avatar selves from their actual selves in response to the online social contexts manipulated by the study. This is in line with some findings (e.g., Markus & Kunda, 1986) that the underlying similar general self-descriptions were very different from the temporary self-conceptions. Theoretically, the findings of this study are consistent with the conceptualization of the self as malleable—that self-concept should not be viewed as a unitary construct or as a generalized view of the self. That is, dependent upon the online social contexts and situations, individuals tend to express different selves. Finally, our mean analyses indicate that participants tend to create avatars that are different from their actual selves in more positive and ideal ways. The overall findings of the study suggest that people tend to express more positive and idealized images of themselves when they interact with others through customized

avatars in virtual environments. However, their idealized avatar selves are reflected by users' actual selves after all.

Further research is needed to address some limitations of the study. One substantial limitation of the study lies in the lack of interaction between avatars and zero-acquaintances. As the accuracy of personality perception might differ as functions of the level of acquaintanceship and social interaction, future research should seek to examine factors that might affect personality perception in a variety of computer-mediated communication contexts (Rouse & Haas, 2003). For example, the effect of different types (e.g., text-based avatar chatting, voiced-based avatar interaction) and lengths (e.g., five min vs. 20 min) and levels (e.g., one-to-one, one-to-many) of interaction can be explored in the future research. Second, participants of this study were college students, which may not be representative of all avatar users. For example, in the current study we did not control their past experience or expertise with the virtual social contexts and avatars. Thus, more research with samples of different avatars along with computer mediated communication expertise is needed to increase the generalizability of the findings.

One of the obvious directions is identifying potential moderating variables that might be associated with the relationships of the study (e.g., self-monitoring). As self-monitoring theory suggests, individuals differ meaningfully in the extent to which they choose to control their expressive behavior and self-presentation (e.g., Gangestad & Snyder, 2000). For example, high self-monitors often change their attitudes and behaviors to fit social and interpersonal considerations of situational appropriateness, whereas low self-monitors tend to behave consistently across social contexts. Thus, more research is needed to further investigate any possible direct or interactive effect of such potential moderating variables on the relationships.

Finally, cross-cultural research suggests that the nature and structure of the self is more discrepant than is commonly assumed (e.g., Markus & Kitayama, 1991). For example, a number of cross-cultural researchers have shown that individuals in collectivistic cultures construct selves that are much more interdependent than those constructed in individualistic cultures (e.g., Cross & Madson, 1997; Markus & Kitayama, 1991; Triandis, 1989, 1995). In this light, an individual's self-construal is expected to moderate his or her sensitivity to social situations. That is, in Western cultures, behavioral variability is considered a threat to the core stable self and results in self-concept confusion and lack of clarity, whereas individual consistency is suggestive of maturity, self-integrity, and unity (Suh, 2002). In contrast, individuals in East Asian cultures

tend to view the self as relatively dynamic and highly responsive to social contexts (Cross, Gore, & Morris, 2003). Thus, future empirical cross-cultural research is certainly needed to provide theoretical insights into the cultural similarities and differences involved in the psychological process of constructing the self.

References

- Albright, L., Kenny, D. A., & Malloy, T. E. (1988). Consensus in personality judgments at zero acquaintance. *Journal of Personality and Social Psychology*, *55*(3), 387-395.
- Berry, D. S., & Finch-Wero, J. L. (1993). Accuracy in face perception: A view from ecological psychology. *Journal of Personality*, 61(4), 497-521.
- Bessière, K., Seay, A. F., & Kiesler, S. (2007). The ideal elf: Identity exploration in World of Warcraft. *CyberPsychology & Behavior*, 10(4), 530-535.
- Borkenau, P., & Liebler, A. (1992). Trait inferences: Sources of validity at zero acquaintance. *Journal of Personality and Social Psychology*, 62(4), 645-657.
- Borkenau, P., & Liebler, A. (1993). Convergence of stranger ratings of personality and intelligence with self-ratings, partner ratings, and measured intelligence. *Journal of Personality and Social Psychology*, 65(3), 546-553.
- Cross, S. E., Gore, J. S., & Morris, M. L. (2003). The relational-interdependent self-construal, self-concept consistency, and well-being. *Journal of Personality and Social Psychology*, 85(5), 933-944.
- Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin*, 122(1), 5-37.
- Ducheneaut, N., Wen, M., Yee, N., & Wadley, G. (2009). Body and mind: A study of avatar personalization in three virtual worlds. *Proceedings of CHI 2009* (pp. 1151-1160). New York: ACM Press.
- Funder, D. C. (1980). On seeing ourselves as others see us: Self-other agreement and discrepancy in personality ratings. *Journal of Personality*, 48(4), 473-493.
- Funder, D. C. (1983). Three issues in predicting more of the people: A reply to Mischel and Peake. *Psychological Review*, 90(3), 283-289.
- Gangestad, S. W., & Snyder, M. (2000). Self-monitoring: Appraisal and reappraisal. *Psychological Bulletin, 126*(4), 530-555.
- Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, *35*(7), 603-618.
- Guitton, M. J. (2010). Cross-modal compensation between name and visual aspect in socially active avatars. *Computers in Human Behavior*, 26(6), 1772-1776.

- Hall, J. A., Andrzejewski, S. A., Murphy, N. A., Mast, M. S., & Feinstein, B. A. (2008). Accuracy of judging others' traits and states: Comparing mean levels across tests. *Journal of Research in Personality*, 42(6), 1476-1489.
- Hancock, J. T., Toma, C., & Ellison, N. (2007). The truth about lying in online dating profiles. *Proceedings of CHI 2007* (pp. 449-452). San Jose: ACM Press.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319-340.
- Holzwarth, M., Janiszewski, C., & Neumann, M. M. (2006). The influence of avatars on online consumer shopping behavior. *Journal of Marketing*, 70(4), 19-36.
- Jackson, D. N., & Paunonen, S. V. (1985). Construct validity and the predictability of behavior. *Journal of Personality and Social Psychology*, 49(2), 554-570.
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five inventory--versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- Joinson, A. N., & Diet-Uhler, B. (2002). Explanations for the perception of and reactions to deception in a virtual community. *Social Science Computer Review*, 20(3), 275-289.
- Kenny, D. A. (1994). Interpersonal perception: A social relations analysis. New York: Guilford.
- Kenny, D. A., Homer, C., Kashy, D. A., & Chu, L. C. (1992). Consensus at zero acquaintance: Replication, behavioral cues, and stability. *Journal of Personality and Social Psychology*, 62(1), 88-97.
- Lawson, K. (2000). Beyond corporeality: the virtual self in postmodern times. *Journal of Psychological Practice*, 6(1), 35-43.
- Lecky, P. (1945). Self-consistency: A theory of personality. New York: Island Press.
- Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224-253.
- Markus, H., & Kunda, Z. (1986). Stability and malleability of the self concept. *Journal of Personality and Social Psychology*, *51*(4), 858-866.
- Markus, H., Smith, J., & Moreland, R. L. (1985). Role of the self-concept in the perception of others. *Journal of Personality and Social Psychology*, 49(6), 1494-1512.
- Markus, H. & Wurf. E. (1987). The dynamic self-concept: A social psychological perspective. Annual Review of Psychology, 38, 299-337.

- McKenna, K.Y.A. (1999). *The computers that bind: Relationship formation on the Internet*. Unpublished doctoral dissertation, University of Ohio.
- Messinger, P. R., Ge, X., Stroulia, E., Lyons, K., Smirnov, K., & Bone, M. (2008). On the relationship between my avatar and myself. *Journal of Virtual Worlds Research*, *1*(2), Retrieved October 19, 2010 from http://journals.tdl.org/jvwr/article/view/352/.
- Mischel, W. (1998). Personality coherence and dispositions in a cognitive-affective personality system approach. In D. Cervone & Y. Shoda (Ed.), *The coherence of personality: Social-cognitive bases of consistency, variability, and organization* (pp. 37-60). New York: Guilford Press.
- Mischel, W., & Peake, P. K. (1982). Beyond déjà vu in the search for cross-situational consistency. *Psychological Review*, 89(6), 730-755.
- Naumann, L. P., Vazire, S., Rentfrow, P. J., & Gosling, S. D. (2009). Personality judgments based on physical appearance. *Personality and Social Psychology Bulletin*, *35*(12), 1661-1671.
- Norman, W. T., & Goldberg, L. R. (1966). Raters, ratees, and randomness in personality structure. *Journal of Personality and Social Psychology*, 4(6), 681-691.
- Nowak, K. L. (2004). The influence of anthropomorphism and agency on social judgment in virtual environments. *Journal of Computer Mediated Communication*, *9*(2), Retrieved October 19, 2010 from http://jcmc.indiana.edu/vol9/issue2/nowak.html.
- Nowak, K. L., & Rauh, C. (2005). The influence of the avatar on online perceptions of anthropomorphism, androgyny, credibility, homophily, and attraction. *Journal of Computer-Mediated Communication*, 11(1), Retrieved October 19, 2010 from http://jcmc.indiana.edu/vol11/issue1/nowak.html.
- Rind, B., & Gaudet, S. (1993). Judging personality traits of adolescents from photographs. *Journal of Social Psychology*, 133(6), 815-819.
- Robins, R. W., Gosling, S. D., & Donahue, E. M. (1997). Are personality judgments based on physical appearance consensual and accurate? In J. Bermúdez, B. de Raad, J. de Vries, A. M. Pérez-García, A. Sánchez-Elvira, & G. L. van Heck (Eds.), *Personality psychology in Europe* (Vol. 6, pp. 70-75). Tilburg, Netherlands: Tilburg University Press.
- Rogers, C. (1961). On becoming a person. Boston: Houghton Mifflin.

- Rosenberg, M. (1979). Conceiving the self. New York: Basic Books.
- Rouse, S. V., & Haas, H. A. (2003). Exploring the accuracies and inaccuracies of personality perception following internet-mediated communication. *Journal of Research in Personality*, 37(5), 446-467
- Schroeder, R. (2002). Social interaction in virtual environments: Key issues, common themes, and a framework for research. In R. Schroeder (Ed.), *The social life of avatars: Presence and interaction in shared virtual environments* (pp. 1-18). London: Springer.
- Shevlin, M., Walker, S, Davies, M. N. O., Banyard, P., & Lewis, C. A. (2003). Can you judge a book by its cover? Evidence of self-stranger agreement on personality at zero acquaintance. *Personality and Individual Differences*, *35*(6), 1373-1383.
- Suh, E. M. (2002). Culture, identity consistency, and subjective well-being. *Journal of Personality and Social Psychology*, 83(6), 1378-1391.
- Swann, W. B., Jr. (1983). Self-verification: Bringing social reality into harmony with the self. In J. Suls & A. G. Greenwald (Ed.), *Social psychological perspectives on the self* (pp. 33-66). Hillsdale, NJ: Erlbaum.
- Swann, W. B., Jr., & Read, S. J. (1981). Self-verification processes: How we sustain our self-conceptions. *Journal of Experimental Social Psychology*, 17(4), 351-372.
- Taylor, T. L. (2002). Living digitally: Embodiment in virtual worlds. In R. Schroeder (Ed.), *The social life of avatars: Presence and interaction in shared virtual environments* (pp. 40-62). London: Springer.
- Triandis, H. C. (1989). The self and behavior in different cultural contexts. *Psychological Review*, *96*, 506-520.
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.
- Vasalou, A., & Joinson, A. (2009). Me, myself and I. Computers in Human Behavior, 25(2), 510-520.
- Watson, D. (1989). Strangers' ratings of the five robust personality factors: Evidence of a surprising convergence with self-report. *Journal of Personality & Social Psychology*, 57(1), 120-128.
- Yee, N., & Bailenson, J. (2007). The proteus effect: The effect of transformed self-representation on behavior. *Human Communication Research*, 33(3), 271–290.