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Avatar creation in virtual worlds: Behaviors and motivations



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ABSTRACT

Avatar creation has become common for people to participate and interact in virtual worlds. Using an online survey ($N = 244$), we investigated both the behavioral characteristics and major motivations for avatar creation in virtual worlds. Our results suggest that a majority of the participants had multiple avatars; these avatars' appearance did not merely resemble the human players; and their personality did not necessarily mirror the player's real personality. Furthermore, participants on average spent over 20 h per week and often interacting with others in the virtual worlds. Our exploratory factor analysis yielded four major motivations: virtual exploration, social navigation, contextual adaptation, and identity representation.

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1. Introduction

Virtual worlds are simulated environments with digital resemblance of animated actors and their physical surroundings where they can engage in interactive activities through computer-generated tools (Bainbridge, 2007). Although virtual worlds have been around since the 1970s, they have evolved from text-based MUDs in the early days to become more commonly executed through 3D modeling, sophisticated graphic design, and multimodal interactive features over the past decade. For example, the most popular types of virtual worlds nowadays are massively multiplayer online role-playing games (MMORPGs) such as *World of Warcraft* and creativity-oriented virtual environments (COVEs) such as *Second Life* (Bainbridge, 2007; Ducheneaut, Wen, Yee, & Wadley, 2009; See Fig. 1). These virtual worlds can easily engage millions of participants. In 2012, *World of Warcraft* claimed that they have over 10 million subscribers (Ziebart, 2012). *Second Life* had at least 1 million active users with \$700 million annual transaction in virtual goods (Lacy, 2012). The personal, social, and financial impact of virtual worlds has become increasingly significant all around the world.

A common practice for people to participate and interact in these virtual worlds is to create avatars. The term avatar is originally defined as the descent of a deity to the Earth in an incarnate form or some manifest shape in Hinduism (Ahn, Fox, & Bailenson, 2012). However, in today's society, it has been broadly adopted as any form of representation that marks a user's identity.

Therefore, a name, a voice, a photo, or an email address can all be considered as a user's avatar (Bailenson, Yee, Blascovich, & Guadagno, 2008). Nonetheless, the most popular use of the term avatar is to refer to the digital self-representation of participants in the virtual worlds (Bailenson et al., 2008; Yee & Bailenson, 2007) and that is how it is defined in this study.

With the advent of technologies, virtual world participants now have a wide range of choices to represent themselves. Graphically, it can be either a two-dimensional icon (Blackwood, 2006; Fink, 1999) or a three-dimensional human-like or fictional creature (Ahn et al., 2012). These avatars can be stock images pre-programmed by professional developers or unique representations created by users themselves with built-in artistic software (Cheng, Farnham, & Stone, 2002; Taylor, 2002). Options for avatar customization have increased significantly in recent years. For example, many virtual worlds now allow participants to modify their avatars' physical features from eye color, hairstyle, height, and body shape to clothing, accessories, and personality traits (see Figs. 2 and 3 for examples of avatar appearance in MMORPGs and COVEs). These features provide users freedom to experiment and build their self-representations with unique appearances, personalities, and personalized behavioral patterns to support their social interactions online (Ahn et al., 2012).

In the earlier work, scholars have found that despite the technological constraints, people prefer to having control of their avatar design (Schroeder, 2002); avatar customization can make digital gaming experiences more pleasant (Bailey, Wise, & Bolls, 2009; Trepte & Reinecke, 2010); and people actually spend considerable amount of time modifying their avatars to represent the characteristics essential to their identities when interacting with others online (Ducheneaut et al., 2009; Lim & Reeves, 2009; Neustaedter &

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Fig. 1. Examples of MMORPGs (top and bottom right) and COVEs (top and bottom left).



Fig. 2. An example of avatar appearance in MMORPGs.

Fedorovskaya, 2009; Ratan & Hasler, 2011; Taylor, 2002; Yee, 2006). Building on previous scholarship, we investigated both the behavioral characteristics and major motivations for avatar creation in virtual worlds in this study.

2. Literature review

2.1. Possible selves

In virtual worlds, users are given ample opportunities to imagine their “possible selves,” reconstruct and try out their identities and personas via avatar creation. Markus and Nurius (1986) first introduced the notion of possible selves. They posited that the self is a malleable construct; people act differently in different situations; they are influenced by social roles and cues; and they have a need for self-presentation. They describe possible selves as a type

of self-knowledge that has to do with how individuals think about their potential and future (Markus & Nurius, 1986).

Possible selves “represent individuals’ ideas of what they might become, what they would like to become, and especially what they are afraid of becoming” (Markus & Ruvolo, 1989, p. 212). Possible selves are constructed based on past experience and imaginary future, therefore can amplify both desirable characteristics (e.g., creative, rich, slim) and dreaded features (e.g., lonely, depressed, alcoholic). They provide a conceptual link between cognition and motivation, incentives for future behavior, and a venue to evaluate people’s current self-perception (Markus & Nurius, 1986). In emerging interactive media such as virtual world, the malleable nature of the self becomes even more important as different aspects of the self can be primed. Therefore, it is important to study multiple aspects of the self-concept in avatar-based interactive media (Jin, 2010).



Fig. 3. An example of avatar appearance in COVES.

2.2. Strategic identities

Throughout human history people have adjusted their behavior and appearance to fit circumstances and to better connect and interact with others. In the 21st century, scholars studying this phenomenon addressed how circumstances, other people, current feelings, and the need to impress all contribute to the formation of various personas. Self-presentation is the way in which an individual may engage in strategic activities “to convey an impression to others which is in his interests to convey” (Goffman, 1959, p. 4). Goffman (1967) argued that we play many roles in our everyday lives; and both the situational factors and other interaction partners are constantly redefining our identities. Positioning is an extended conceptualization of self-presentation (Harré & Van Langenhove, 1991; Hermans, 1996; Talamo & Ligorio, 2001). According to Harré & Van Langenhove (1991), the choice about what possible self to show is driven by strategic roles that participants pursue while acting within that situation. In other words, the activity of positioning is people's perception of how that social situation is characterized and what features are more relevant and effective in that specific situation.

In virtual worlds, identities are more fluid and people have opportunities to have new experiences otherwise impossible (Morie, 2008). Research has shown different self-presentation strategies emerge in virtual environments. Vasalou and Joinson (2009) found that avatars on blogging sites were created to accurately reflect their owners' physical appearance, lifestyle, and preferences. By contrast, participants on dating and gaming sites accentuated certain aspects of their avatars to reflect the tone and perceived expectations of the context. For instance, avatars in dating were made to look more attractive while avatars in gaming were made to look more intellectual. This indicates that how users choose to present themselves via avatars depends on different communication goals and purposes (Huffaker & Calvert, 2005; Riegelsberger, Counts, Farnham, & Phillips, 2006; Toma, Hancock, & Eliason, 2008; Vasalou & Joinson, 2009).

2.3. Representational identity

Recently, Schultze (2013) applied the perspective of representational identity founded by the theatrical metaphor to theorize the concepts of possible selves and strategic identities in virtual environments. The original idea of representational identity refers to an assumption of intentionality and a conscious, agential self who directs the performance (Blumer, 1969). The performer has supposedly shaped in his or her mind the kind of person he or she

wants to portray. Based on these premises, “identity is conceptualized as a more or less stable object (i.e., a self) that is carefully performed for others in an act of impression management” (Schultze, 2013).

For example, Schultze (2012) used face-to-face interviews and weekly photo-diaries to explore how embodied identity is performed in virtual worlds. She found that most of the participants sought to represent stable self-attributes that they treated as unique to them (e.g., gender and interest). For instance, most of the participants made their avatars personable and their avatars' gender corresponding to their own. Some of the participants also created avatars that represented their real life interests (e.g., a Texan participant who is a Trekkie created a avatar as a “space cowboy”). Therefore, the perspective of representational identity could be a critical cue to help us understand how users choose to represent their identities in virtual worlds, and what makes them create avatars in a particular way that is related to their actual selves.

2.4. Motivations for avatar creation

A few studies have been informative to our current understanding of motivations for avatar creation. Ducheneaut et al. (2009) explored how and why users “customize” their avatars, as well as the user perceived ease and satisfaction of use with existing avatar creation tools. They administered a questionnaire to more than a hundred users of three virtual worlds (i.e., *Maple Story*, *World of Warcraft*, and *Second Life*) and found three contributing factors: (a) idealized self, (b) standing out, and (c) following a trend. The first factor is self-explanatory: users choose to create an avatar that may bear some resemblance to their real-life appearance, but with idealized features. The second factor applies to users whose choice in avatar reflects a desire to have an unconventional look. The third factor describes avatars that have been modified to resemble a celebrity or reflect a popular trend in either the real world or the virtual world.

Later, Kafai, Fields, and Cook (2010) examined various aspects in teen's avatar creation as self-representation in *Whyville.net*, a virtual world with more than 1.5 million registered players age 8–16. They listed six reasons for creating avatars the way teens did in *Whyville*: (1) pursuing the pure aesthetics of a look, (2) making it in part like their real self, (3) affiliating with something or someone, (4) because they cannot have it in real life, (5) aligning oneself for or against a popular trend, and (6) for a functional reason like disguise. In the first category, none of the reasons were associated with how users look or want to look in real life. The motivation here was artistic, taking matching or disparate parts and molding them into a look that appeared attractive to them. For the second reason, some users made their avatars similar to themselves either in physical appearance or in personality. In this way these users used their avatars to show aspects of their real selves. Furthermore, a related motivation for a particular avatar look was to affiliate with something or someone that the users liked. These displays of affinity sometimes started conversations and led to friendships based on observations of shared interest. The fourth category described that some users use the avatar to have a look or belonging that they could not have in real life. In this way, these users used their avatars to play out fantasies or desires unattainable in the rest of their lives. Yet another reason users gave for choosing a particular look was to associate with or against a popular trend; people creating such avatars were not necessarily doing so because they looked good or fit a personality but because they were popular, or stood against the trend to stand out themselves. While there are a number of reasons for designing avatars, all of the above users so far focused on looks. In contrast, some users focused on functionality rather than appearance such as disguise.

2.5. Gap and research questions

While the concepts of possible selves, strategic identities, and representational identity can provide a general idea of why people tend to explore various identities to cope with different situations, and prior studies revealed invaluable insights about motivations for avatar creation in specific virtual worlds and among users of certain age, additional empirical research is needed. Previous studies that involved avatar creation are limited to specific virtual world contexts or age groups. To fill this gap, we aimed to examine avatar creation in both types of virtual worlds (i.e., MMORPGs and COVEs). We were especially interested in participants' behavior patterns as well as their motivations when creating avatars. Therefore, the research questions of this study are:

RQ1: What are the behavioral patterns of avatar creation in virtual worlds?

RQ2: What are the major motivations for avatar creation in virtual worlds?

3. Method

3.1. Participants

A total of 396 virtual world users participated in an online survey with 244 of completing the questionnaires and making up the final sample. Among them, 66.5% were male and 33.5% were female; they aged 18 to 55 ($M = 26.84$, $SD = 6.98$). In terms of their ethnicity, 53.1% were Caucasian, 25.1% were Asian, 8.2% were mixed, 6.6% were of African descent, 3.7% were Latino/Hispanic, 2.1% were East Indian/South-Asian, and 1.2% were Native American. In terms of education level, 6.6% finished high school or equivalent, 2.5% went to vocational or technical school, 5.3% had an Associate degree, 63.8% had a Bachelor's degree, 16.5% had a Master's degree, 3.3% had a professional degree such as M.D., J.D., and 2.1% had a doctoral degree,

3.2. Procedure

Participants were recruited through a research announcement posted on popular forums about MMORPGs and COVEs such as *Wowhead*, *IMVU*, *Thumdar*, *Avameet*, *Zam* (*Allakhazam*), *Diablo Incgamers*, *Nexon*, and *Gamesforum*. Qualifications for research participation included being at least 18 years of age and having had created at least one avatar in virtual worlds. Using a hyperlink in the research announcement, qualified participants were directed to the online questionnaire and answered questions about virtual worlds, avatar descriptions, user motivations, and demographic information. Participants were offered an incentive of winning one of the five \$25 Amazon gift cards. Data collection was completed in October 2012.

3.3. Measurement

In order to answer the research question about behavioral patterns of avatar creation in virtual worlds, participants were asked to report the total number of avatars they used on a regular basis. After that, they were instructed to focus their main avatars which were the one avatar that they used most frequently and answered questions about the physical appearance and personality of their main avatars, the length of usage of their main avatars, the type of virtual world they used their main avatars for, how much time they were spending in that virtual world, their involvement in social activities in that virtual world, and how many other avatars they had in that virtual world.

In order to answer the research question about major motivations for avatar creation in virtual worlds, a pilot study was conducted using a separate online survey in June 2012. A total of 92 participants provided answers to open-ended questions about their motivations for creating avatars in virtual worlds with an incentive of winning a \$100 Amazon gift card. Each participant was treated as a sampling unit while each distinct argument of their motivations for avatar creation was treated as a recording and coding unit. There were 649 coding units that yielded 54 initial statements. After an iterative process of thematic analysis, an 18-item, 7-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree) was developed to capture the most common reasons why people created avatars.

4. Results

4.1. Behavioral patterns

The number of avatars participants used on a regular basis in virtual worlds ranged from 1 to 16 ($M = 3.26$, $SD = 2.92$). Of all the participants, 27.0% reported having only one avatar that they used on a regular basis; 31.3% reported having two; 11.5% reported having three, 8.6% reported having four, 9.4% reported having five, and the remaining 12.3% reported having more than five.

When asked about the main avatar's look, 64.3% reported that their main avatars resembled human being, 33.6% reported that their main avatars resembled another species, and 2.0% reported that their main avatars resembled non-organic creatures. Participants were asked to rate on a 10-point scale about the similarity in terms of physical appearance and personality between their main avatars and themselves in real life (1 = very different, 10 = very similar). The average score for physical appearance was 3.20 ($SD = 2.68$), which suggests that participants' main avatars look rather different from their look in reality. The average score for personality was 5.66 ($SD = 3.14$), which suggests that participants' main avatars may or may not reflect their own personality depending on the specific circumstances.

When asked how long it had been since they created their main avatars, the answers varied considerably, from less than a month to 168 months, with an average of 48.18 months ($SD = 30.10$). These main avatars were created in 28 different virtual worlds; 77% participants said their main avatars were created for MMORPGs while 23% were for COVEs. The length of participants' membership in the virtual world where they created their main avatars ranged from 1 month to 132 months, with an average of 51.58 months ($SD = 28.96$). When asked how many hours per week do you spend in the virtual world using your main avatar, the responses varied from 1 to 126 h, with an average 22.41 h per week ($SD = 17.96$). Only 6.6% of the participants said they spent time in that virtual world mostly alone without any social interaction, 20.5% said mostly with others, and 72.1% said sometimes alone and sometimes with others. Also, 85.6% of the participants said they created more than one avatar in that virtual world, which varied from 1 to 33 ($M = 8.29$, $SD = 8.23$).

4.2. Major motivations

Initial assessment of the correlation matrices indicated a considerable degree of inter-statement correlation. From the correlation matrix, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy index and the Bartlett test of Sphericity indicated the data set's appropriateness for factor analysis (Hair, Anderson, Tatham, & Black, 1998). Results of a Principal Components analysis yielded six factors out these 18 items with the eigenvalue above 1, but the Scree Plot indicated only four distinct factors. Then the

Table 1

Factor loadings for exploratory factor analysis with varimax rotation of major motivations for avatar creation in virtual worlds.

Scale item	1	2	3	4
I create my main avatar to be unique and not a mainstream follower in the virtual world	.64	.15	–.09	.19
I create my main avatar to be creative in the virtual world	.58	.14	.11	.30
I create my main avatar to reflect my aesthetic view in the virtual world	.55	.05	.07	.15
I create my main avatar to reflect my mood at the time in the virtual world	.52	.21	.20	.01
I create my main avatar to differentiate it in the virtual world from my actual self	.40	.08	.27	–.20
I create my main avatar to fit surroundings in the virtual world such as themes, or situations I am immersed in	.40	.26	.27	.01
I create my main avatar to build a reputation in the virtual world	.10	.80	.15	.21
I create my main avatar to reach a specific functional goal such as business, camouflage, or upgrade in the virtual world	.21	.61	.14	–.21
I create my main avatar to make a lot of friends in the virtual world	.27	.60	.28	.03
I create my main avatar to engage other players and socialize in the virtual world	.12	.45	.13	.24
I create my main avatar depending on whom I interact with in the virtual world	.24	.23	.72	–.04
I create my main avatar because a particular look of others in the virtual world catches my eyes	.05	.10	.71	.14
I create my main avatar to fit surroundings in the real world such as weather and current affairs in the virtual world	.06	.33	.60	.11
I create my main avatar to resemble my actual self in the virtual world	.16	.08	.15	.59
I create my main avatar to reflect an ideal version of my actual self in the virtual world	.36	.06	.24	.56
I create my main avatar to portray a certain personal trait in the virtual world	.30	.25	.15	.43
I create my main avatar to fit the role I am playing in the virtual world	.35	.18	.05	.33
I create my main avatar to have fun in the virtual world	.03	.02	.06	–.13

Note: Factor loadings >.40 are in boldface.

methods of Maximum Likelihood for extraction and Varimax for rotation were used. Results of this exploratory factor analysis suggested that the four factors together accounted for 41.09% of the variance, with the first factor accounting for 12.30%, the second factor accounting for 11.15%, the third factor accounting for 10.23% of the variance, and the fourth factor accounting for 7.41% of the variance. All items and factor loadings are reported in Table 1.

The first factor focused on virtual exploration (Cronbach's $\alpha = .71$). Items loaded on this factor tended to emphasize participants wanting to be unique, different, and creative when they are immersed in the virtual worlds, which allow them to explore things they normally cannot do in reality. The second factor focused on social navigation (Cronbach's $\alpha = .75$). Items loaded on this factor tended to emphasize player interaction, developing friendship, and building reputation. The third factor focused on contextual adaptation (Cronbach's $\alpha = .75$). Items loaded on this factor tended to emphasize adapting to specific contexts such as social actors encountered, current events, and physical surroundings. The fourth and also last factor focused on identity representation (Cronbach's $\alpha = .65$). Items loaded on this factor tended to focus on participants' consideration related how they wanted to represent their identities in virtual worlds, be it a resemblance of the actual self in reality, portraying a particular personal trait, or enacting the ideal self in their mind.

5. Discussion

5.1. Summary

This study aimed to investigate the behavioral patterns and major motivations for avatar creation in the virtual worlds. We found that avatar creation is a common practice and a popular activity – A majority of our participants (73.0%) had multiple avatars; the number of avatars varied from 1 to 16 with an average of 3. These digital representations were not necessarily a simple, direct resemblance of the human players behind the computer screen. In fact, over a third (35.6%) of the participants reported making their avatars look like another species or non-organic creatures. In addition, it was a split when it came to the tendency of the avatar's personality mirroring the human player's personality.

When we zoomed into ask about the participants' main avatars, that is the one avatar that they used most frequently, we learned that on average they had this main avatar for 2 years and were

spending over 20 h a week (like a part-time job) using this main avatar in virtual world. Most of them (93.4%) used this main avatar to interact with others in the virtual world at least sometimes if not most of the time.

We also discovered four major motivations for the participants to create their avatars in the virtual worlds: (1) virtual exploration, taking advantage of the digital, immersive environments to do things otherwise impossible or difficult; (2) social navigation, maneuvering the social dynamic in these complex worlds to make friends and build reputation; (3) contextual adaptation, adjusting and responding to the socio-cultural contexts; and (4) identity representation, portraying either the actual or the ideal self.

In addition, these findings are in line with the aforementioned concepts of possible selves, strategic identities, and representational identity. The idea of possible selves suggests that the self is a malleable construct that can be influenced by different psychological and social situations (Markus & Nurius, 1986). Possible selves are therefore different from one another and always stay fluid depending on the presumption or expectation of other future selves (Markus & Ruvolo, 1989). This concept can best explain why virtual world participants employ vastly different strategies to create avatars according to their goals and external influence. Whether accomplishing a functional objective or expressing personal aesthetic views, an avatar is a powerful medium for individuals to visually represent their possible selves in the virtual worlds.

Similarly, the concept of strategic identities can be explained in the present findings. As mentioned earlier, individuals choose possible selves in a way that is driven, in part, by the perception of how that social situation is characterized, and what features are more relevant and effective in that specific situation. In other words, the behavior of avatar creation is intentional and the “possible self” is designed to achieve a specific goal.

The current findings also echo the concept of representational identity in avatar creation. Schultze (2012) addressed that participants of virtual worlds seek to represent stable self-attributes such as gender and interest. The motivations we found such as portraying actual selves and reflecting participants' aesthetic views can serve the best explanation for this phenomenon.

Moreover, the results of this research are encouraging for our continued understanding of motivations for using avatars in a virtual environment. The four dimensions of the motivations identified in the current study are consistent with previous research exploring avatar customization and personalization (Ducheneaut et al., 2009; Kafai et al., 2010), while at the same time providing more empirically quantitative understanding of avatar creation

motivations. These findings can not only contribute to the literature of virtual self-representation, but also provide guidance to virtual world designers in developing better avatar customization interface according to user's demands.

5.2. Limitations and future research

This study has several limitations that may generate directions for future studies. First, given logistical constraints, the initial statements about avatar creation motivation were only extracted from answers to open-ended survey questions and primarily coded by one person. Research in the future may benefit from focus groups to reveal more insights and have the content analyzed by multiple coders. In addition, the sample is biased with more participants in MMOPRGs than COVEs and may not be equally generalizable to both types of virtual worlds. Future research may take advantage of stratified sampling to obtain a more balanced representation of MMOPRGs and COVEs as well as more specific types within each type.

This study is an initial attempt towards understanding avatar creation behaviors and motivations in the virtual worlds. Further empirical examination is needed to refine, validate, and expand the findings of the exploratory factor analysis in this study. The 18-item Likert scale can be modified to better capture the essence of the various motivations of avatar creation. Once a more polished scale is developed, a confirmatory factor analysis can be conducted to validate the instrument.

Researchers may also explore the relationships between types of avatar creation motivation and user characteristics as well as behavioral patterns in virtual worlds such as the type of avatars they actually create. For example, Neustaedter and Fedorovskaya (2009) investigated the variety of ways in which people create and evolve avatar appearances in *Second Life* through contextual interviews. Their findings revealed that users balanced pressure from the social norms of *Second Life* with the need to create an appearance that matches a desired virtual identity. These identity needs differ based on four types of users: (a) realistics, (b) ideals, (c) fantasies, and (d) role-players. Based on this demonstration, a user who created an ideal self-avatar or a fantastic avatar could be attributed to the reason of trying to differentiate virtual selves (avatars) from their actual selves.

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References

- Ahn, S. J., Fox, J., & Bailenson, J. N. (2012). Avatars. In W. S. Bainbridge (Ed.), *Leadership in Science and Technology: A Reference Handbook* (pp. 695–702). Beverly Hills, CA: Sage Publications.
- Bailenson, J. N., Yee, N., Blascovich, J., & Guadagno, R. E. (2008). Transformed social interaction in mediated interpersonal communication. In E. Konijn, S. Utz, M. Tanis, & S. Barnes (Eds.), *Mediated Interpersonal Communication* (pp. 77–99). New York, NY: Routledge.
- Bailey, R., Wise, K., & Bolls, P. (2009). How avatar customizability affects children's arousal and subjective presence during junk food-sponsored online video games. *CyberPsychology and Behavior*, 12(3), 277–283. doi:10.1089/cpb.2008.0292.
- Bainbridge, W. S. (2007). The scientific research potential of virtual worlds. *Science*, 317(5837), 472–476. http://dx.doi.org/10.1126/science.1146930.
- Blackwood, K. (2006). *Casino Gambling for Dummies*. Hoboken, NJ: Wiley Publishing Inc.
- Blumer, H. (1969). *Symbolic Interactionism: Perspective and Method*. Englewood Cliffs, NJ: Prentice-Hall.
- Cheng, L., Farnham, S., & Stone, L. (2002). Lessons learned: Building and deploying shared virtual environments. In R. Schroeder (Ed.), *The Social Life of Avatars: Presence and Interaction in Shared Virtual Environments* (pp. 90–111). London: Springer-Verlag.
- Ducheneaut, N., Wen, M. H., Yee, N., & Wadley, G. (2009). Body and mind: A study of avatar personalization in three virtual worlds. *Proceedings of the 27th International Conference on Human Factors in Computing Systems*, 1151–1160. http://dx.doi.org/10.1145/1518701.1518877.
- Fink, J. (1999). *Cyberseducation: Reality in the Age of Psychotechnology*. Amherst, NY: Prometheus Books.
- Goffman, E. (1959). *The Presentation of Self in Everyday Life*. Garden City, NY: Doubleday.
- Goffman, E. (1967). *Interaction Ritual: Essays in Face-to-Face Behavior*. Chicago, IL: Aldine Publishing.
- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate Data Analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Harré, R., & Van Langenhove, L. (1991). Varieties of positioning. *Journal for the Theory of Social Behaviour*, 21(4), 393–407. http://dx.doi.org/10.1111/j.1468-5914.1991.tb00203.x.
- Hermans, H. J. M. (1996). Voicing the self: From information processing to dialogical interchange. *Psychological Bulletin*, 119(1), 31–50. http://dx.doi.org/10.1037/0033-2909.119.1.31.
- Huffaker, D. A., & Calvert, S. L. (2005). Gender, identity, and language use in teenage blogs. *Journal of Computer-Mediated Communication*, 10(2) (article 1). Retrieved from <http://jcmc.indiana.edu/vol10/issue2/huffaker.html>.
- Jin, S. A. (2010). I can be happy even when I lose the game: The influence of chronic regulatory focus and primed self-construal on exergamers' mood. *Cyberpsychology, Behavior, and Social Networking*, 13(4), 467–471. doi:10.1089/cyber.2009.0268.
- Kafai, Y. B., Fields, D. A., & Cook, M. S. (2010). Your second selves: Player-designed avatars. *Games and Culture: A Journal of Interactive Media*, 5(1), 23–42. http://dx.doi.org/10.1177/1555412009351260.
- Lacy, S. (2012, July 6). Philip rosdale: The media is wrong, secondlife didn't fail. Retrieved from <<http://pandodaily.com/2012/07/06/philip-rosdale-the-media-is-wrong-secondlife-didnt-fail/>>.
- Lim, S., & Reeves, B. (2009). Being in the game: Effects of avatar choice and point of view on psychophysiological responses during play. *Media Psychology*, 12(4), 348–370. http://dx.doi.org/10.1080/15213260903287242.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41(9), 954–969. http://dx.doi.org/10.1037/0003-066X.41.9.954.
- Markus, H., & Ruvolo, A. (1989). Possible selves: Personalized representations of goals. In L. A. Pervin (Ed.), *Goal Concepts in Personality Research* (pp. 211–241). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Morie, J. F. (2008). The performance of the self and its effect on presence in virtual worlds. In *Proceedings of the 11th Annual International Workshop on Presence* (pp. 265–269).
- Neustaedter, C., & Fedorovskaya, E. (2009). Presenting identity in a virtual world through avatar appearances. *Proceedings of Graphics Interface*, 2009, 183–190.
- Ratan, R. A., & Hasler, B. (2011, November). *Designing the virtual self: How psychological connections to avatars may influence education-related outcomes of use*. Paper presented at the 1st European Immersive Education Summit, Madrid, Spain.
- Riegelsberger, J., Counts, S. J., Farnham, S. D., & Phillips, B. C. (2006). Sounds good to me: Effects of photo and voice profiles on gaming partner choice. *Proceedings of Computer-Supported Cooperative Work*, 159–162. http://dx.doi.org/10.1145/1180875.1180899.
- Schroeder, R. (Ed.). (2002). *The Social Life of Avatars: Presence and Interaction in Shared Virtual Environments*. London: Springer-Verlag.
- Schultze, U. (2012). Performing embodied identity in virtual worlds. *European Journal of Information Systems*. http://dx.doi.org/10.1057/ejis.2012.52.
- Schultze, U. (2013). Understanding cyborgism: Using photo-diary interviews to study performative identity in Second Life. In L. Phillips & U. Plesner (Eds.), *Researching Virtual Worlds: Methodologies for Studying Emergent Practices*. New York, NY: Routledge.
- Talamo, A., & Ligorio, B. (2001). Strategic identities in cyberspace. *CyberPsychology and Behavior*, 4(1), 109–122. http://dx.doi.org/10.1089/10949310151088479.
- 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-Verlag.
- Toma, C. L., Hancock, J. T., & Eliason, B. N. (2008). Separating fact from fiction: An examination of deceptive self-presentation in online dating profiles. *Personality and Social Psychology Bulletin*, 34(8), 1023–1036. http://dx.doi.org/10.1177/0146167208318067.
- Treppe, S., & Reinecke, L. (2010). Avatar creation and video game enjoyment: Effects of life-satisfaction, game competitiveness, and identification with the avatar. *Journal of Media Psychology: Theories, Methods, and Applications*, 22(4), 171–184. http://dx.doi.org/10.1027/1864-1105/a000022.
- Vasalou, A., & Joinson, A. N. (2009). Me, myself and I: The role of interactional context on self-presentation through avatars. *Computers in Human Behavior*, 25(2), 510–520. http://dx.doi.org/10.1016/j.chb.2008.11.007.
- Yee, N. (2006). The demographics, motivations and derived experiences of users of massively-multiuser online graphical environments. *PRESENCE: Teleoperators and Virtual Environments*, 15, 309–329. http://dx.doi.org/10.1162/pres.15.3.309.
- Yee, N., & Bailenson, J. N. (2007). The proteus effect: The effect of transformed self-representation on behavior. *Human Communication Research*, 33(3), 271–290. http://dx.doi.org/10.1111/j.1468-2958.2007.00299.x.
- Ziebart, A. (2012, November 7). World of Warcraft subscriber numbers remain over 10 million. Retrieved from <<http://www.joystiq.com/2012/11/07/world-of-warcraft-subscriber-numbers-remain-over-10-million/>>.