

Personality Impressions of World of Warcraft Players Based on Their Avatars and Usernames: Consensus but No Accuracy

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ABSTRACT

Every week an estimated 20 million people collectively spend hundreds of millions of hours playing massively multiplayer online role-playing games (MMORPGs). Here the authors investigate whether avatars in one such game, the World of Warcraft (WoW), convey accurate information about their players' personalities. They assessed consensus and accuracy of avatar-based impressions for 299 WoW players. The authors examined impressions based on avatars alone, and images of avatars presented along with usernames. The personality impressions yielded moderate consensus (avatar-only mean ICC = .32; avatar plus username mean ICC = .66), but no accuracy (avatar only mean $r = .03$; avatar plus username mean $r = .01$). A lens-model analysis suggests that observers made use of avatar features when forming impressions, but the features had little validity. Discussion focuses on what factors might explain the pattern of consensus but no accuracy, and on why the results might differ from those based on other virtual domains and virtual worlds.

Keywords: Accuracy, Avatars, Consensus, Impression Formation, Massively Multiplayer Online Role-Playing games (MMORPGs), Person Perception, Personality Judgments, Self-Presentation, Virtual Worlds, World Of Warcraft

INTRODUCTION

Every week an estimated 20 million people collectively spend hundreds of millions of hours in virtual worlds playing massively multiplayer

online role-playing games (MMORPGs; Van Geel, 2013; Yee, 2005). MMORPG players create avatars as digital representations of themselves that are used to interact with others, undertake solo or group quests, and explore

DOI: 10.4018/IJGCMS.2015010104

the virtual world (Bainbridge, 2012; Martin, 2005). The *World of Warcraft* (WoW) is the most popular MMORPG with an estimated 10 million players worldwide that engage in the fantasy-based virtual world (Blizzard Press Center, 2014). Ongoing relationships among players in WoW are often maintained solely through avatar interactions and written or audio chats that are central to facilitating game-play (Nardi & Harris, 2006). Yet, little is known about how people perceive the personality of players based on their avatar's appearance. The current study examined personality impressions of WoW players by focusing on the following research questions: Do people form consensual personality impressions of players based on their avatars? Are the personality impressions formed based on avatars accurate? What avatar cues are associated with personality impressions, and which cues (if any) are valid indicators of a player's personality?

The increasing numbers of interactions undertaken in virtual worlds has generated a growing interest in the degree to which avatars and other forms of virtual representation accurately reflect the people they represent. The type of virtual domain (i.e., blogging, dating, or gaming) is thought to influence the degree of discrepancy between an avatar's characteristics and those of its creator (Vasalou & Joinson, 2009). One factor that may be influencing the discrepancy is the accountability associated with self-presentation in the virtual domain. For example, studies of virtual domains where presentation is tied to offline identity, suggest that personal web pages (Marcus, Machilek, & Schütz, 2006; Vazire & Gosling, 2004), Facebook profiles (Back, et al., 2010), and email addresses (Back, Schmukle, & Egloff, 2008) elicit relatively accurate personality impressions. However, studies of virtual worlds where presentation is not necessarily tied to offline identity (e.g., SecondLife, WoW), demonstrate mixed findings (Belisle & Bodur, 2010; Graham & Gosling, 2012). MMORPG players in particular have great flexibility in creating their avatars (Bainbridge, 2012; Martin, 2005), which provides the players with many

options—perhaps more than are available in the offline world—for expressing their personalities via their appearance.

Qualitative research suggests that several factors may influence MMORPG players' decisions regarding the appearance of their avatars; these factors include the customization features available in the game (e.g., what race and clothing an avatar may possess), and the individual motivations and characteristics of the player (Isaksson, 2012; Koivisto, 2009). The customization features available to players in WoW reflect the fantasy-based theme of the virtual world called "Azeroth"—a mythical land of many races, major world powers, and wartime conflicts (Bainbridge, 2012). WoW players create their avatar by selecting its gender (i.e., male or female), race (e.g., human, elf, orc), faction (e.g., "good" characters are part of the Alliance, "evil" characters are part of the Horde), and class (e.g., warrior, hunter, mage). Players may also continue to alter their avatars' appearance by acquiring additional objects (e.g., clothes, armor, virtual pets) by advancing their character and succeeding in battle. These character decisions at the start of the game influence the general appearance, size, mood, and stance of the player's avatar in the virtual world.

MMORPG player motivations (e.g., immersion; Yee, 2007) and characteristics (e.g., gender, race, class) may also influence the avatar creation process (Dunn & Guadagno, 2012; Isaksson, 2012). For example, players motivated by achievement and battling others may be strategic about selecting an avatar with a particular skill set associated with its race or class, such as an orc warrior compared to an elven healer. Studies that have examined personality expression in virtual worlds, including WoW (McCreery, Krach, Schrader, & Boone, 2012; Yee, Ducheneaut, Nelson, & Likarish, 2011; Yee, Harris, Jabon, & Bailenson, 2011) have also demonstrated relationships between player personality and in-game behavior (e.g., Extraverted WoW players engaging in more group activities), suggesting that player personality may also be expressed in avatar appear-

ance. To contextualize our research questions with regard to prior psychological research on person perception, we next review the research on personality impressions in virtual domains.

Personality Impressions formed in Virtual Domains

To understand the sources of accurate personality impressions made in the context of virtual environments, many researchers have adopted a “lens model” approach (Back et al., 2008; Back et al., 2010; Brunswik, 1956; Graham & Gosling, 2012; Vazire & Gosling, 2004). The lens model approach distinguishes between three different aspects of impressions: the degree of inter-judge consensus among observers’ impressions of a target (known as *consensus*), the accuracy of those impressions (*accuracy*), and the features (*cues*) that are associated with observers’ impressions and the actual personality of the target (Kenny 1994). Most recent studies have focused on impressions of five broad dispositional traits, known as the Big Five (John & Srivastava, 1999). The Big Five trait domains distinguish individuals on the basis of their levels of Extraversion (degree to which they are outgoing vs. reserved), Agreeableness (kind vs. skeptical), Conscientiousness (self-disciplined vs. impulsive), Neuroticism (anxious vs. emotionally stable), and Openness (open-minded vs. traditional). Thus, in the current study we chose to examine how people in WoW evaluate one another on the Big Five domains based on avatar appearances. Overall, the existing literature suggests that even when based on minimal “thin slices” of information (Ambady & Skowronski, 2008; Borkenau & Liebler, 1992), impressions in virtual domains elicit consensual personality impressions, although the relative accuracy of personality impressions varies by the type of domain (e.g., personal web pages, Facebook profiles; *for a review, see* Graham, Sandy, & Gosling, 2011).

Only a couple studies have directly examined personality impressions in virtual worlds. One study of *SecondLife* (SL; a realistic looking virtual world designed to be a parallel or

“second” life for users), found observers made consensual impressions of users based on their avatars, and avatar cues were found to have some validity (Belisle & Bodur, 2010). In particular, impressions of Extraversion and Agreeableness showed the strongest consensus among observers, and were associated with cues such as femininity, friendly expressions, and attractiveness (Belisle & Bodur, 2010). Another study of WoW, found that observers made consensual impressions of players based on their usernames, however the username cues had little validity (Graham & Gosling, 2012). Impressions of Agreeableness showed the strongest consensus among observers, and were associated with cues such as aggressiveness and femininity (Graham & Gosling, 2012). These initial studies suggest that people will make consensual impressions of WoW players’ personality based on avatars. The discrepant accuracy findings from impressions based on SL avatars and WoW usernames suggest that impressions based on richer forms of self-presentation in WoW (i.e., avatars) may elicit more accurate impressions. Studying impressions based on avatars, as we do in the present study, provides more ecological validity than impressions based on usernames alone because interactions in WoW take place between avatars.

The Current Study

The current study examined consensus and accuracy of personality impressions of WoW players based on their avatars. In addition, to isolate the individual and joint impact on consensus and accuracy of avatars and usernames, we supplemented the previous work (Graham & Gosling, 2012) with two new conditions. One condition examined observer impressions based on WoW avatars alone and the other condition examined observer impressions based on WoW avatars in conjunction with usernames (as they would be viewed in game-playing situations). We also examined the avatar cues that may be influencing impressions of player personality.

In line with the lens model framework (Brunswik, 1956), we expected the impressions

of players based on their avatars to result in one of three broad patterns of findings. First, avatars may provide information that is too impoverished or too confusing for observers to generate a coherent personality impression. If this is the case, then avatar-based impressions of that player should result in no agreement among observers regarding what that player is really like. If observers cannot even agree on what the player is like, then their joint impressions cannot be accurate either. The second possibility is that the avatars convey a coherent impression to observers, but the impression the avatars convey deviates from the players' actual personalities. If this is the case, there should be inter-observer agreement among observers but their impressions would not be accurate. Third, if the players are using the avatars to accurately convey their actual personalities, then observers' avatar-based impressions should both generate agreement among observers and the observers' impressions should be accurate.

METHOD

Procedure

The current study implemented a lens-model design previously used in studies examining impressions formed on the basis of email addresses (Back et al., 2008), WoW usernames (Graham & Gosling, 2012), and *Second Life* avatars (Belisle & Bodur, 2010). Specifically, we collected data from three independent sources: Observer ratings of WoW player personality based on their avatar images, the WoW players' self-reports of personality, and codings of avatar features (e.g., feminine, mysterious). This approach allowed us to examine the interobserver consensus among the personality ratings, the accuracy of the observers' impressions, and the degree to which various avatar features were associated with the observers' impressions and with the WoW players' personalities.

- **WoW Players:** Participants were drawn from a sample of 1,357 WoW players

recruited via a popular WoW community forum (<http://www.wowinsider.com>; reported in Graham & Gosling, 2012). Participants completed personality self-reports, reported their username, and the server on which they play, in exchange for a chance to win 25 pieces of gold (the WoW currency) in a raffle. The avatar images were obtained by searching for each of the 1,357 username and server combinations in the *Armory* website, an official WoW database that displays various player stats. We were able to locate 299 (22%; 39 females, mean age = 27.76, $SD = 8.27$) of the 1,357 WoW players in the initial pool. These players reported using WoW for an average of 21.59 months ($SD = 9.73$), at an average of 25.4 hours per week ($SD = 14.62$). Avatars were captured via screenshot images, which served as the stimuli to be rated (see Figure 1 for example avatar images).

- **Measures:** Participants completed the 44-item Big Five Inventory (BFI: John & Srivastava, 1999), which measures the Big Five personality dimensions: Extraversion, Conscientiousness, Agreeableness, Emotional Stability, and Openness (Cronbach's alpha = .87, .75, .84, .85, and .72 respectively). The BFI would be too long for observers to use to rate the 299 avatar images. Instead, following the design of previous studies (Back et al., 2010; Belisle & Bodur, 2010; Graham & Gosling, 2012), a very brief measure of the Big Five was used, the Ten Item Personality Inventory (TIPI), which is a widely used, validated instrument that has demonstrated high convergence with the BFI (Gosling, Rentfrow, & Swann, 2003).
- **Observer Ratings:** All observers were drawn from a convenience sample of undergraduates at The University of Texas at Austin (UT). None of the observers played WoW themselves, but they underwent a 2-hour training session to ensure they were all familiar with the basics of the game design and general theme. Two sets of

observer ratings were obtained for two sets of stimuli: 1) avatar images alone (hereafter referred to as AVATAR-ONLY), and 2) avatar images plus usernames (hereafter referred to as AVATAR+USERNAME). Both groups of stimuli were rated by a set of 5 different observers (i.e., 5 observers rated the AVATAR-ONLY stimuli, and 5 different observers rated the AVATAR+USERNAME stimuli). To avoid fatigue, observers rated the avatar images in sets of 50 and were encouraged to take breaks as necessary. Observers took approximately 3 hours to rate each set of images.

- Avatar Features:** Characteristics for coding the avatar images were derived from three sources: 1) the categories used by Graham and Gosling (2012) to code WoW usernames were reviewed, and the 11 items (of 15) that could be applied to avatar images (e.g., aggressive, sexual) were retained; 2) the categories used by Naumann et al., (2009) to code physical appearance from photographs were reviewed, and the 5 items (of 10) that could be applied to avatar images (e.g., healthy vs. sickly, distinctive vs. ordinary) were retained; 3) a group of 5 observers from both stimuli conditions were asked about the cues they attended to while completing the impression ratings, resulting in an additional set of 18 features (e.g., good vs. evil, presence of weapons). We did not have an adequate sample for each race to generate reliable findings regarding the role of avatar race as a cue, so we do not focus on these findings here. However, these preliminary analyses may be of interest to some readers so we present them in the Appendix (see Appendix, Table 1 and Table 2 for full results). Eight UT undergraduates (1 male, 7 females), none of whom served as observers, coded each image on the 34 feature categories (mean $\alpha = .81$; max = .99, min = .44). To combat fatigue, coders coded the avatar images in sets of 50 and were encouraged to take breaks as needed.

Coders took about 2 hours to code each set of images.

RESULTS

Interobserver Consensus

To examine the extent to which observers agreed in their personality impressions we estimated interobserver consensus using intraclass correlations (ICCs). The reliability of both single ratings (ICC[2,1]) and the reliability of the aggregated impressions (ICC[2, k]) were estimated (Shrout & Fleiss, 1979). As shown in Table 1, consensus was significant for nearly all personality dimensions in both conditions (AVATAR-ONLY, AVATAR+USERNAME). In the AVATAR-ONLY condition, Agreeableness showed the strongest consensus, followed by Openness, and Extraversion. Emotional Stability showed the least consensus, and no consensus was found for Conscientiousness (Table 1, Column 1). In the AVATAR+USERNAME condition, Agreeableness showed the strongest consensus, followed by Emotional Stability, and Extraversion. Conscientiousness also showed some consensus, and the least consensus was found for Openness (Table 1, Column 3). Overall, consensus was stronger among the raters in the AVATAR+USERNAME condition (mean ICC = .66), compared to the AVATAR-ONLY condition (mean ICC = .32).

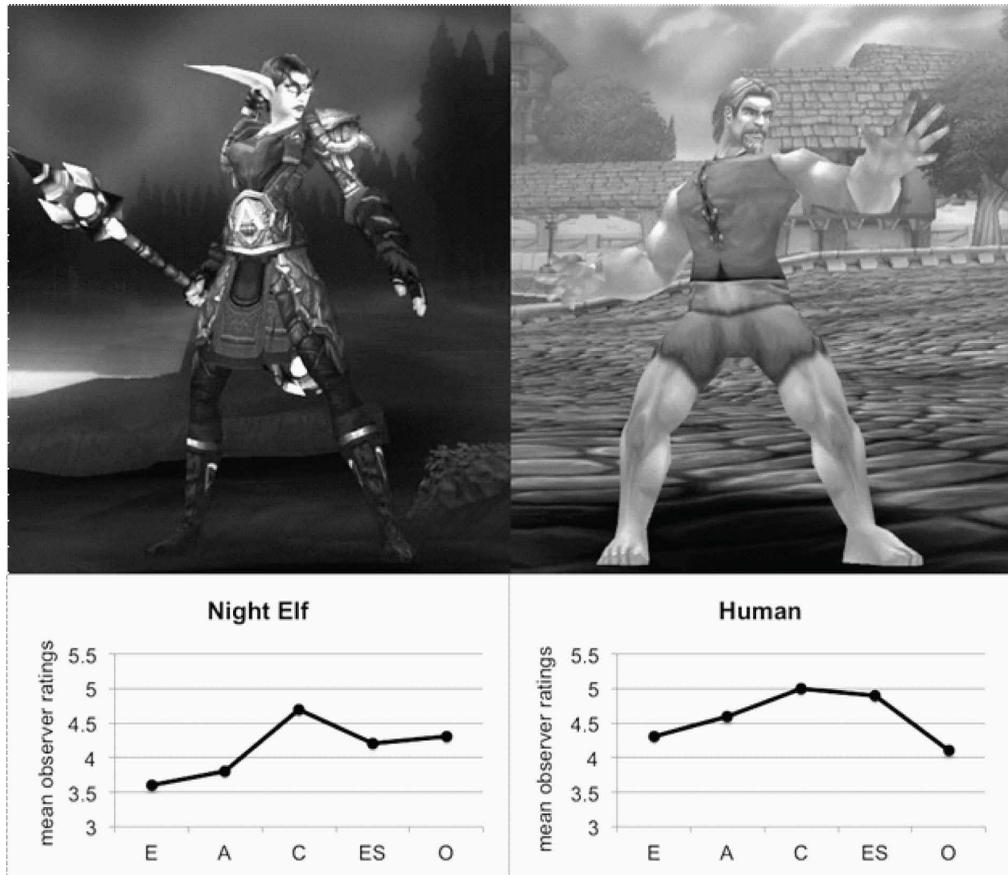
Interobserver Accuracy

To assess the extent to which observers made accurate personality impressions, we computed correlations between the aggregated observer ratings and the targets' self-reports. As shown in Table 1, we found no evidence for accuracy of observer impressions.

Avatar Cues

To identify any systematic basis for these inaccurate impressions, we used a lens model analysis (Brunswik, 1956). The perceivable features (i.e., "cues") of the avatar images were

Figure 1. Example screenshots and ratings of WoW players. Avatar screenshots were taken from the WoW Armory database. Mean ratings of individual avatar images by 5 observers using the Ten Item Personality Inventory (TIPI, Gosling, Rentfrow, & Swann, 2003)



used to examine the extent to which observers' impressions were associated with the avatar cues, the validity of the cues, and the sensitivity of the observers to cue validity.

- Cue Utilization:** To examine the extent to which observers' impressions were associated with the cues, a series of regressions were performed. The average observer rating for each personality dimension was regressed onto the cue scores. The regressions were computed for both the AVATAR-ONLY and AVATAR+USERNAME conditions. The adjusted-*R* values demonstrate the extent to which observers' impressions were as-

sociated with features of the avatars. As shown in Table 2, the cue utilization scores were higher among the observers in the AVATAR+USERNAME condition. These observers showed stronger tendencies to use the perceivable cues in the avatar images, particularly when making judgments of Agreeableness, Emotional stability, and Extraversion.

To determine which individual cues were associated with judgments of each personality dimension, a series of correlations were computed to estimate the cue-utilization score for each avatar feature. The cue utilization scores

Table 1. Observer consensus and accuracy of personality impressions of players based on their WoW avatars, usernames, and a combination of avatar and username

Traits Assessed	Consensus (ICC)			Accuracy (r)		
	Avatar Only	Username Only ^a	Avatar + Username	Avatar Only	Username Only ^a	Avatar + Username
Extraversion	.09 (.32**)	.07(.28)**	.23 (.60**)	.03	-.01	-.02
Agreeableness	.15 (.48**)	.29(.67)**	.35 (.73**)	.09	-.01	.09
Conscientiousness	-.02 (-.10)	.17(.50)**	.16 (.49**)	.03	-.02	-.05
Emotional Stability	.07 (.28**)	.07(.28)**	.25 (.62**)	.01	.00	-.01
Openness	.09 (.33**)	-.05(.20)**	.11 (.38**)	.01	-.01	.04

Note. Consensus is indexed by intraclass correlations (ICCs) among 5 observer (non-WoW players). Single and average ICCs are presented, with average ICCs shown in parentheses. Accuracy is the correlation between observers' ratings and players' self-reports (N = 299).

^aFor comparison purposes, findings for impressions of players based on WoW usernames alone (from Graham & Gosling, 2012) are presented in data columns 2 and 5.

** p < .01. * p < .05.

were computed by correlating the average observer ratings with the cues, separately for the AVATAR-ONLY and AVATAR+USERNAME conditions. Observers' ratings of personality were associated with all the cues measured, but their magnitude varied depending on the personality trait (Table 3). For example, avatars that appeared to be healthy and to have

a positive (vs. negative) mood were rated as more extraverted, agreeable, conscientious, and emotionally stable. Avatars that appeared to be evil (vs. good) were rated as more introverted, disagreeable, unconscientious, and neurotic. Avatars that appeared to be mysterious and sneaky were rated as more introverted, disagreeable, and neurotic.

Table 2. Cue utilization, cue validity, and cue sensitivity of personality impressions of players based on their WoW avatars, usernames, and a combination of avatar and username

Traits Assessed	Cue Utilization			Cue Validity		Cue Sensitivity		
	Avatar Only	Username Only ^a	Avatar + Username	Player Self-Reports	Username Only ^a	Avatar Only	Username Only ^a	Avatar + Username
Extraversion	.41**	.26**	.49**	.02	.00	-.08	.60	-.05
Agreeableness	.55**	.37**	.70**	-.03	.00	.07	.07	.06
Conscientiousness	.16**	.28**	.45**	.00	.07	-.11	.39	-.11
Emotional Stability	.37**	.25**	.57**	-.03	.07	-.13	-.11	.01
Openness	.33**	.19**	.40**	.00	.06	-.30	.15	-.06

Note. Cue utilization is indexed by the adjusted-R values when mean observer scores are regressed on cue scores.

Cue validity is indexed by the adjusted-R values when players' self-reports are regressed on cue scores.

Cue sensitivity is indexed by vector correlations between absolute values of cue-utilization and cue-validity correlations. Mean correlations and vector correlations were computed using Fisher's *r*-to-*z* transformation.

^aFor comparison purposes, findings for impressions of players based on WoW usernames alone (from Graham & Gosling, 2012) are presented in data columns 2, 5, and 7.

** p < .01. * p < .05.

- **Cue Validity:** We next examined cue validity by regressing the users' self-reports onto the cue scores for each personality dimension. The regressions were computed for both the AVATAR-ONLY and AVATAR+USERNAME conditions. The adjusted- R values demonstrate the extent to which avatar features serve as valid indicators of player personality. As shown in Table 2, the findings indicate that none of the cues served as valid indicators of user personality. Cue validities ranged from $R = -.03$ for Agreeableness and Emotional Stability to $R = .02$ for Extraversion. We also assessed the validity of the various individual cues by correlating self-reports with the cue values (Table 3). However, we found evidence for the validity of only a few cues.
- **Cue Sensitivity:** To assess observer sensitivity to the (limited) validity of the cues, we computed column-vector correlations between the cue-utilization and cue-validity correlations for each personality dimension (Table 2). We computed a conservative estimate of column-vector correlations, by correlating the (Fisher's Z -transformed) absolute values for the cue-utilization and cue-validity correlations. The cue sensitivity findings indicate lower levels of observer sensitivity than those found when forming impressions on the basis of WoW usernames (Graham & Gosling, 2012; shown in Table 2 for comparison) and *Second Life* avatars (Belisle & Bodur, 2010).

DISCUSSION

This study examined the consensus and accuracy of personality impressions of WoW players based on their avatars, and avatars with usernames in tandem. We found observers form moderately consensual impressions about player personality from avatar appearance. However, we found no evidence for accuracy of observers' impressions. We found the observers'

personality impressions were associated with avatar features. However, the features were not diagnostic of the player's self-reported personalities. The lack of association between observer impressions and players' personalities was partially explained by the lack of valid cues available, and the observers' insensitivity to cue validity. Our findings are consistent with previous work examining impressions of WoW players based on usernames alone (Graham & Gosling, 2012), but stand in contrast to research on impressions from avatars in the SL virtual world (Belisle & Bodur, 2010). Here we discuss possible reasons for this discrepancy and suggest future directions for understanding the psychological processes that are played out in this virtual domain. In particular, the findings raise two questions. First, what is driving the consensual but inaccurate impressions among observers? Second, why is accuracy found in impressions from avatars in *Second Life* but not in WoW?

Existing models of social perception can inform the findings regarding consensus and accuracy. Kenny's (1994) Weighted Averages Model suggests consensus increases when observers make use of shared stereotypes. Our findings of moderate consensus but no accuracy suggest that observers may be making use of consensual but invalid stereotypes regarding players and their self-presentation in WoW (Lee, Jussim, & McCauley, 1995). In particular, we found Extraversion and Agreeableness to consistently elicit among the strongest consensual impressions, compared to the other personality dimensions. These findings suggest that in WoW shared stereotypes may be strongest for traits that are particularly relevant to social interaction. The specific cues associated with impressions of Extraversion and Agreeableness point to the kinds of stereotypes observers may be using when judging avatars on these traits. For example, avatars that appeared to be good (vs. evil), healthy (vs. sickly), and positive (vs. negative) in mood were judged as more extraverted and agreeable. The existence of these consensual impressions suggests they might influence interactions in WoW. For instance,

Table 3. Lens model analysis of observable cues in players' avatars and a combination of avatar and username

Cue Validity					Cues ("lens")	Cue Utilization									
E	A	C	ES	O		E		A		C		ES		O	
					Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	
-.03	.03	.01	.02	-.05	Lots of accessories vs. few	-.05	-.09	-.21**	-.27**	.09	-.25**	-.08	-.25**	.26**	-.02
.02	.08	.01	.05	-.01	Character blends in vs. stands out	.22**	.30**	.21**	.21**	-.04	-.09	.13*	.16**	.22**	.17**
-.02	.02	-.07	-.04	-.01	Small vs. large in size	-.15**	-.16**	-.39**	-.43**	-.07	-.36**	-.24**	-.34**	-.05	-.26**
-.05	-.05	.01	-.05	-.01	Perceived Gender	-.17**	.01	.23**	.38**	-.11	.30**	-.08	.25**	-.14*	.18**
.01	.03	.04	.00	.04	Hair stands out	.28**	.28**	.18**	.19**	-.02	.16**	.09	.21**	.02	.29**
.00	-.10	.06	-.03	.01	Skin stands out	.06	.04	-.07	-.12	-.10	-.02	-.13*	-.10	.06	.16**
.00	.10	-.03	-.03	.09	Negative vs. positive mood	.32**	.43**	.64**	.75**	.13*	.39**	.45**	.68**	.05	.27**
-.06	-.17**	.05	.02	-.04	Light vs. dark background	-.25**	-.29**	-.40**	-.43**	-.05	-.07	-.32**	-.35**	-.08	-.05
-.03	.04	.05	.09	.01	Weapon Prominence	.12*	.06	-.20**	-.27**	-.02	-.20**	-.09	-.17**	.18**	.14*
.01	.05	.09	.09	.06	Presence of weapons	.12*	.04	-.18**	-.26**	.00	-.22**	-.07	-.16**	.14*	.17**
-.04	.04	-.02	.06	.02	Facing camera vs. away	.10	.03	-.20**	-.16**	-.05	-.21**	-.11	-.15*	-.02	-.04
.08	-.07	-.03	-.03	.00	Stance	-.01	.09	.08	.19**	-.03	.22**	-.08	.05	-.10	.07
	.00	.01	.10	-.04	Aggressive	.07	.00	-.56**	-.62**	-.21**	-.48**	-.39**	-.55**	.13*	-.09
.04	-.01	.04	.04	.05	Confident vs. meek	.23**	.30**	-.32**	-.25**	-.06	-.14*	-.25**	-.16**	.07	.24**
.02	-.01	.08	.00	-.03	Creative	.17**	.22**	-.13*	-.07	-.11	-.14*	-.14*	-.12*	.31**	.36**
-.02	.05	.02	.03	.02	Cute	.13*	.25**	.48**	.63**	-.03	.40**	.18**	.48**	.02	.21**
.05	.00	.05	.03	.02	Distinctive vs. ordinary	.03	.06	-.38**	-.41**	-.17**	-.37**	-.34**	-.45**	.28**	.20**
.10	-.08	-.01	.08	-.09	Emotional	-.03	.02	.09	.17**	-.12*	.19**	-.12*	.05	-.13*	-.05
.01	-.08	.02	.01	-.07	Evil vs. good	-.30**	-.42**	-.68**	-.77**	-.17**	-.50**	-.49**	-.73**	-.03	-.24**
-.05	-.05	.01	-.05	.01	Feminine	-.10	.07	.30**	.47**	-.07	.38**	-.04	.34**	-.14*	.20**
.06	.05	.12*	.00	.02	Funny	.29**	.26**	.18**	.04	-.06	-.22**	.23**	.00	.34**	.23**
.07	.05	.06	-.02	-.02	Geeky	.16**	.11	.01	-.10	-.10	-.26**	.11	-.14*	.37**	.14*
.02	.11	-.04	.02	.12*	Healthy vs. sickly	.29**	.44**	.45**	.56**	.10	.34**	.26**	.57**	.00	.23**
.04	.05	-.02	.04	.00	Masculine	.19**	.06	-.31**	-.44**	.07	-.31**	.00	-.29**	.15**	-.16**
.04	-.03	.02	.02	-.04	Menacing vs. unthreatening	-.08	-.19**	-.66*	-.75**	-.15*	-.53**	-.42**	-.67**	.03	-.18**
-.10	-.18**	-.05	-.06	-.10	Mysterious	-.48**	-.43**	-.42**	-.40**	.00	-.03	-.40**	-.36**	-.13*	-.10

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Table 3. Continued

Cue Validity					Cues ("lens")	Cue Utilization									
E	A	C	ES	O		E		A		C		ES		O	
						Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username	Avatar Only	Avatar + Username
.02	.01	-.02	.00	-.09	Self-deprecating	-.18**	-.27**	.01	-.14*	.04	-.11	.09	-.21**	.11	-.18**
.06	-.02	-.06	.00	.05	Self-Enhancing	.09	.24**	-.22**	-.08	-.10	-.06	-.27**	-.04	.07	-.06
-.06	-.08	-.04	-.04	.00	Sexual	-.02	.15**	.21**	.36**	-.04	.33**	-.08	.30**	-.14*	.23**
-.09	-.14*	.00	-.01	-.12*	Sneaky	-.25**	-.26**	-.29**	-.27**	-.11	-.02	-.29**	-.32**	-.06	.07
.04	.03	-.03	.01	.02	Strong vs. weak	.05	-.03	-.45**	-.52**	-.02	-.42**	-.21**	-.41**	.07	-.15*
-.04	-.06	.05	-.03	.04	Stylish vs. unstylish	-.10	.03	-.07	.11	.08	.31**	-.21**	.10	-.06	.07
-.01	.03	-.04	-.01	.07	Trustworthy	.30**	.45**	.63**	.72**	-.19**	.53**	.42**	.68**	.12*	.27**
.02	-.03	.07	-.02	-.02	Unique vs. conventional	-.05	-.04	-.46**	-.52**	-.18**	-.45**	-.35**	-.52**	.20**	.13*

Note. E = Extraversion; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; O = Openness.

Coefficients represent Pearson correlations. Cue validity is the correlation between players' self-reports of the Big Five dimensions and the presence of a cue. Cue utilization is the correlation between observer ratings of personality and presence of a cue.

** p < .01. * p < .05.

many WoW players are part of a “guild” – a team of players who regularly meet online to take on various quests or undertake battle raids together (Williams et al., 2006). Players with avatars that appear extraverted and agreeable may interact more with other players or form stronger social bonds, compared to those that appear introverted and disagreeable. That is, it is possible that players approach other players with avatars that appear good, healthy, and generally positive more frequently because they may be perceived as being more amenable to socializing. Our findings suggest that a player who is socially motivated to play WoW (Yee, 2007), should consider how approachable their avatar may seem based on appearance, and consider taking a more pro-active approach to socializing with others and initiating relationships if they want to compensate for an avatar that appears evil, sickly, or generally negative.

The finding of no observer accuracy raises the possibility that avatar presentation in WoW may simply not contain any diagnostic

player information. In the context of Funder's Realistic Accuracy Model (Funder, 1999) this finding would suggest that WoW players are not exhibiting any cues (via their avatars and usernames) that reflect their offline personality. If this is the case, then the cues are not available for observers to detect, and observers end up making use of cues that are not representative of player personality. The observed cue-validity correlations suggest that virtually none of the avatar features available to observers offered “good information” that could lead to accurate person perception (Funder, 1999). Impressions might show some accuracy if more objective cues related to the WoW game theme were considered (e.g., the race or class of the avatar), and if WoW players who had experience playing the game were used as observers. Previous research on impressions formed from WoW usernames found no differences in the accuracy of impressions formed by WoW-players and non-players (Graham & Gosling, 2012). However, the inclusion of a richer host

of game-related avatar cues might provide diagnostic cues that players could use to form more accurate personality impressions. In the current study, there were limited numbers of avatars representing the different races. However, the preliminary findings (see Appendix, Table A1 and Table A2) suggest avatar race may be diagnostic of player personality. For example, Taurean avatars (bull-like creatures) tended to belong to more agreeable players and Night Elves tended to belong to less agreeable players. Future work should explore whether WoW-player observers show more sensitivity to game-related valid cues than do non-players.

We suspect that there are three possible reasons for the observed discrepancy between accuracy of impressions in SL and WoW. One possible reason for this discrepancy is the type of virtual environment for which the avatar is being designed (Vasalou & Joinson, 2009). SL is a virtual world designed to parallel the physical world, and it offers users a number of features for those wanting to create human avatars. In contrast, WoW is a gaming virtual world designed to reflect a fantasy world, and it offers users only a limited number of features for those wanting to create human avatars. In fact, some studies suggest that WoW players report not having enough customization options for creating the desired appearance of their avatar (Isaksson, 2012; Martin, 2005). However, research has found that MMORPG players sometimes create avatars that do not resemble them in appearance or personality (Lin & Wang, 2014). That is, in line with the theme of role-playing games, WoW players may be using their avatars to express something other than their actual personalities. For example, one study of WoW players found they rate their avatars' attributes more favorably than their own, suggesting that avatars may represent idealized selves (Bessiere et al., 2007). However, it is also possible that players are creating completely separate character personalities, or that they have multiple avatars that they alternate playing with (Bainbridge, 2012; Kafai et al., 2010), suggesting that any one avatar may not reflect

all aspects of their actual identity (Ducheneaut, et al., 2009). For example, a player's Night Elf Warrior avatar may reflect his low Agreeableness, whereas his Gnome Mage avatar may reflect his high Openness. Future work should explore whether players design their avatars to present other selves or separate characters depending on the context of the virtual domain. For example, *Second Life* may attract people who want to present an extension of their own personality, while WoW may attract people who want to present an augmented, or separate character personality. If this is the case, avatar cues in WoW that observers might rely on when forming impressions would not convey any accurate personality information.

A second possible reason for the low accuracy is that people may present different things via their avatars depending on their own motivations for engaging with the virtual world and individual characteristics (e.g., race, gender). Existing research on the motivations driving WoW players to play the MMORPG suggest this may be the case (Yee, 2007). A key motivation contributing to the use of WoW is the ability to immerse oneself in a virtual environment (Billieux et al., 2013; Graham & Gosling, 2013) where a character's appearance and behavior can be designed and controlled. Thus, individual player motivations (e.g., immersion, social, achievement) may contribute to the type of presentation players engage in when designing their avatar. For example, one study found that MMORPG players who were motivated to interact with others tend to put more of their actual self into the avatar, whereas players who are motivated to play the game and interact with the virtual world tend to care less about the appearance of their avatar (Isaksson, 2012). Some research has even suggested that the limited range of pre-set avatar races in WoW severs the ties between players' actual and avatar-based identities (Weiss & Tettegah, 2012). Other research suggests that players are seeking to create avatars consistent with ideal male and female bodies for their own respective genders (Dunn & Guadagno, 2012),

which would also interfere with accurate self-presentation. Thus, further research is needed to explore the effects of such limitations and motivations on the avatar-creation process.

The third possible reason for the low accuracy found here is that the self-reports might provide a poor criterion for accuracy. That is, it is possible that the observers accurately perceiving the players personalities but that the self-reports do not provide a good measure of what the player is really like. Self-reports are generally considered to be a reasonable criterion for accuracy and many other studies of personality impressions that have identified observer accuracy have done so using self-reports as the accuracy criterion (e.g., Back et al., 2008; Marcus et al., 2006; Mehl et al., 2006). Nonetheless, it is possible that other accuracy criterion (e.g., informant reports) would have resulted in accurate personality impressions.

CONCLUSION

Consistent with previous research on impressions of WoW players (Graham & Gosling, 2012), the current study demonstrated WoW avatars and usernames lack validity as representations of actual player personality. The findings suggest that although consensus is attained in virtual environments from minimal information, the accuracy of the impressions vary by domain. In particular, domains that hold some offline accountability seem to exhibit more valid user information (e.g., personal web pages, FB profiles, email addresses), whereas domains with less accountability seem to allow users the opportunity to deviate from their offline self (e.g., virtual worlds). Ultimately, WoW is an MMORPG where the various game objectives and player motivations may be driving avatar creation and self-presentation choices. To further understand domains in which social perception can be trusted, future research should examine consensus and accuracy of impressions formed from self-presentation in other virtual domains in which the degree of offline accountability varies, such as other virtual

worlds, blogs, online forums, and media-sharing sites. As daily social interactions continue to move into virtual domains, understanding how individuals are perceived on the basis of online appearance will become increasingly relevant for efficiently navigating online social worlds.

ACKNOWLEDGMENT

We thank Megha Arora, Miranda Badgett, Sarah Bright, Francie Chang, Justin Chumbley, Emily Glazener, Daniella Herrera, Jessica Kago, James Kubricht, Anthony Loya, Carl Mirus, Zarina Moreno, Jessica Norriss, Duc Phan, Kevin Rayes, Geeta Shukla, Wei Tian, and Dustin Vegas for their help with data collection.

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APPENDIX

Supplemental tables showing correlations between avatar race and player personality and observers' impressions.

Table 4. Correlations between WoW Player self reports and race of avatar

	Taurean (N=32)	Night Elves (N=60)	Humans (N=59)	Dwarves (N=31)
<i>Extraversion</i>	.04	-.11	.02	-.01
<i>Agreeableness</i>	.13*	-.12*	.05	.05
<i>Conscientiousness</i>	.00	.06	-.05	.07
<i>Emotional Stability</i>	.07	-.06	-.03	.06
<i>Openness</i>	.00	.01	.01	.01

Note. Correlation between players' personality self-reports and their avatars' race.

* $p < .05$.

Table 5. Correlations between observer ratings and race of avatar

	Taurean (N=32)	Night Elves (N=60)	Humans (N=59)	Dwarves (N=31)
<i>Extraversion</i>	.14*	-.17**	-.07	.15**
<i>Agreeableness</i>	.01	-.14*	.28**	.18**
<i>Conscientiousness</i>	-.08	.11*	.16**	.07
<i>Emotional Stability</i>	.08	-.13*	.17**	.25**
<i>Openness</i>	.17**	-.08	-.24**	.18**

Note. Correlation between mean observer ratings (5 non-WoW players) and the avatars' race.

** $p < .01$. * $p < .05$.