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April G. Sutton, M.A.

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Approved:

Karl W. Stukenberg, Ph.D., ABPP

Kathleen J. Hart, PhD, ABPP

Karl W. Stukenberg, Ph.D., ABPP
Chair, School of Psychology

Kathleen J. Hart, Ph.D., ABPP
Dissertation Chair
Avatar identification and its effects on MMORPG game play
Dissertation Committee

Chair      Kathleen J. Hart, Ph.D., ABPP
           Professor of Psychology

Member     Christian End, Ph.D.
           Associate Professor of Psychology

Member     Morell Mullins, Ph.D.
           Professor of Psychology
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This study investigated massively multiplayer online role-playing games (MMORPGs) players’ avatar identification and its relationship to hours spent per week playing MMORPGs and MMORPG addiction scores. An international sample of 233 adult participants, all of whom currently played at least one MMORPG regularly, was recruited via online message boards and Amazon’s Mechanical Turk service. Three distinct avatar identification groups were formed based on the differences between ratings of the avatar’s Big Five Inventory-44 (BFI-44) personality factors and those of the participant: Positive Self Attributes, Similar Avatar-Self Attributes, and Positive Avatar Attributes. While no statistically significant differences were found between these groups on MMORPG addiction scale scores or the hours spent playing per week, statistically significant differences were found between the three avatar identification groups on the personality characteristic of Extraversion of the BFI-44. Further research into the potential role avatar identification and personality characteristics of the gamer may have in determining MMORPG game play is needed.
Online computer games known as massively multiplayer online role-playing games (MMORPGs) received a large amount of negative publicity in the public following highly publicized incidents, including a young man who committed suicide in Wisconsin following a rejection by another player in his game of choice (Kohn, 2009) and a couple in South Korea whose three-month-old daughter died of neglect while they spent hours raising a virtual child in an internet café (Salmon, 2010). However, the number of people who play MMORPGs has continued to grow over the past decade. Van Geel (2013) reported that active subscriptions for most of the top MMORPGs is currently around 19 million. While this is a slight decrease from previous years, where active subscriptions were estimated to be 20 to 21 million, this number is likely an underestimate of MMORPG players as it does not include all of the MMORPGs on the market and does not account for games that have free-to-play models, which is currently one of the most popular business models for MMORPGs and does not require the gamer to subscribe to the game in order to play. Although there has been debate about whether or not there is evidence to support a diagnostic category of computer game addiction using symptoms adapted from other addictions, Internet Gaming Disorder was listed in the Diagnostic and Statistical Manual-5 (DSM-5, APA, 2013) as a condition for further study.

MMORPGs involve the use of a player-created avatar (the character the person creates and then plays in the game) and are constantly being updated to include new gaming content, making the game and the goals the player can achieve within the game never-ending (Chan & Vorderer, 2006). Previous studies have found that the average MMORPG player typically spends 24 to 26 hours per week playing his or her game of choice (Griffiths et al., 2004; Williams et al., 2008), which is significantly higher than the average console game player, who plays 7.2 to 12
hours a week, on average (London, 2013; Peterson, 2012). The amount of time spent playing MMORPGs attracted the attention of researchers who were interested in understanding why gamers spend so much time in these virtual worlds and what effects such gaming may have on the player’s functioning outside of the gaming situation.

The research conducted so far has yielded mixed results regarding the potential positive and negative aspects of playing MMORPGs. Whereas no definitive statements about cause and effect—positive or negative—can be made because of the correlational nature of the research, it appears that gamers appreciate the social component of MMORPGs (Griffiths et al., 2004), which allows them to build significant connections with other players and discuss otherwise sensitive topics openly (Cole & Griffiths, 2007). These games have also been cited as a means of alleviating negative feelings like loneliness, stress, anger, and boredom (Hussain & Griffiths, 2009). On the flip side, some studies have found that MMORPG players spent less time socializing outside of the game, had more conflict with others, neglected offline responsibilities like work or school, and had reduced sleep as a result of playing when compared to off-line video game players, such as console gamers (Griffiths et al.; Liu & Peng, 2009). Studies have also identified a higher rate of depression, lower self-esteem, and a higher tendency to use gaming to distract from or avoid real-world problems amongst MMORPG gamers versus other online gamers (Stetina et al., 2010; Williams et al., 2008).

The character the gamer creates and uses to navigate the virtual world is known as his or her avatar. The use of an avatar in video games is not a new concept, but the player’s ability to create and personalize his or her own avatar is a more recent development and common in MMORPGs. How the gamer connects to and potentially internalizes the avatar he or she has created is an indication of his or her avatar identification, which researchers think may be a
significant component in how much time a gamer dedicates to playing his or her MMORPG (Smahel et al., 2008; Trepte et al., 2010).

Because the concept of avatar identification is a relatively new phenomenon, little research exists on the topic, including standardized protocols or instruments to measure the concept. Trepte and Reinecke (2010) surveyed 666 MMORPG players about their connections to their avatars and whether this impacted their enjoyment of the MMORPG they played. Trepte and Reinecke created an avatar identification scale based on a 10-item version of the Big Five Inventory (Rammstedt & John, 2007) in order to measure similarities and differences between the gamer and the avatar. They asked the participants to rate themselves on the 10 factors listed and then to rate their avatars on the same 10 factors. They compared the ratings to establish avatar identification, which they defined as the degree to which the player’s self-rating matched the player’s rating of his or her avatar. Using this measure of agreement, Trepte and Reinecke found that higher avatar identification was positively correlated with the player’s enjoyment of the game, as measured by the player’s self-report.

Trepte and Reinecke (2010) did not examine the possible relationship between avatar identification and game play habits, but Smahel, Blinka, and Ledabyl (2008) asked a sample of 548 MMORPG players to answer questionnaires that contained items related to game playing habits, including possible addiction (as measured by researcher-created questions examining typical indicators of addiction, such as tolerance, withdrawal symptoms, and interpersonal conflicts), and the player’s relationship with his or her avatar. They found a significant correlation between players’ identification scores and addiction scores. However, their measurement of avatar identification was not well-designed; they asked only four questions, such as whether the person and his or her avatar are “the same” and whether the player “possesses the
same skills and abilities” as his or her avatar (Smahel et al., 2008, p. 717). Given that avatars often possess otherworldly powers, like the ability to fly or fight dragons with their bare hands, it is unlikely that the average person would say that their abilities are equal to or better those possessed by their avatars. Thus, Smahel and colleagues’ questions were not specific enough to assess what many researchers assume to be important about a player’s connection with his or her avatar.

Self-discrepancy theory (Higgins, 1987), which is derived from self-psychology (Kohut, 1977), states that there are different ways in which we view ourselves that can impact our cognitive and emotional functioning. The three domains of self as outlined by this theory are the actual self, which is made up of the attributes you believe you possess, the ideal self, which is a representation of attributes that you wish you possessed, and the ought self, which is a representation of attributes that you believe you should possess (Higgins, 1987). Incongruity among these different selves can cause distress, disappointment, and dissatisfaction, particularly when the actual self does not meet the standards of the ideal or the ought selves, which can leave the person feeling as if his or her goals are unmet or otherwise unfulfilled.

Messages of how the person should be come from a variety of sources. Higgins (1987) indicated that most often these values and goals come from significant others like friends and family, but they can also be the product of the media we are exposed to throughout our lives. Perhaps the most salient example of internalizing ideals from the media is the increased dissatisfaction with physical appearance and increased pathological eating behaviors in women who view images of the thin-ideal bodies that are shown on television, in magazines, and on the internet (Bair, Kelly, Serdar, & Mazzeo, 2012). While it has not been examined in the literature
at this point, it is possible that a similar link of forming or exploring values for the ideal self could be found in the avatars that gamers create and play with in MMORPGs.

People can also identify with individuals portrayed in media. Used in this context, Cohen described that identification is created when individuals feel as if he or she is experiencing the events of another as if those events were happening to them, is a more internalized process than mere imitation of another or desiring to have what the other person has and is important to contributing to the development of a person’s identity. Cohen’s theory of identification with media characters states that viewing these characters in novels, television, and movies allows the observer to vicariously experience the world in ways that he or she cannot or has not yet been able to experience, catch a glimpse of what another identity may be like (such as having a different job or being of a different socioeconomic status), or to learn about and help the individual develop goals, thoughts, and feelings similar to those of the character that he or she is identifying with.

Cohen (2001) identified four dimensions that he considered central to the measurement of identification with media characters. The first of these dimensions is empathy for the character or otherwise sharing the feelings of the character such as being happy with the character when the character is happy rather than simply feeling happy for the character. The second of these dimensions is sharing the perspective of the character (e.g., feeling as if the individual understands the internal motivations of the character). Internalizing and sharing the goals that the character has is the third dimension of identification. The final dimension is how absorbed with the character the individual becomes when being exposed to the character. While Cohen references this theory in regards to characters from novels, television, and movies, it is possible to use this theory of identification with established video game characters like Mario from Mario
Bros. or Master Chief from Halo. However, this theory may not be applicable to avatars because these characters are not separate from the individual engaging with them. In fact, the actions, goals, and attributes of the avatars are determined by the choices that the individual behind the computer makes, giving this individual more ability to customize, interact with, and manipulate than standard media like television and novels.

The aim of the current study was to measure gaming habits as it relates to the player’s avatar identification. To address limitations in the measurement of avatar identification found in previous studies, it was measured using an objective personality measure that takes into account the exceptional qualities that avatars can possess in the virtual world. Participants were categorized into three levels of avatar identification: discrepant avatar identification in favor of the avatar (Positive Avatar Attributes), discrepant avatar identification in favor of the self (Positive Self Attributes), and gamers who did not report discrepancies between themselves and their avatars (Similar Avatar-Self Attributes). These groups were compared on a measure of gaming addiction, number of hours spent gaming, and on a measure of personality.

Method

Participants

The final sample for this study was 233 adult active gamers (playing at least one MMORPG) who responded to messages on online MMORPG message boards, both game-specific and general forums \( n = 96 \) or through Amazon’s Mechanical Turk (MTurk) service \( n = 137 \). Recruitment was initially though MMORPG message boards without an incentive; this resulted in 79 responses. In order to increase sample size, an incentive was offered through the message board for two months; this resulted in an additional 17 participants. Additionally, the study was posted onMTurk for two months; 137 individuals responded through this method and
they received reimbursement for participation in keeping with MTurk policies. Recruitment postings for each sample are in Appendix A, Appendix B, and Appendix C.

Overall, 338 completed surveys were submitted. However, 105 surveys submitted were disqualified for the following reasons: being under the age of 18 \( (n = 15) \), not actively playing a MMORPG \( (n = 12) \), submitting diary cards wherein any of the days reported playing more than 24 hours for that day \( (n = 13) \), or not completing the open-ended responses \( (n = 65) \), resulting in 233 unique participants in this survey. Table 1 presents the demographic characteristics of the total sample, and by recruitment method. Overall, the average age of respondents was 32.85 years (range = 18 to 72 years). Most participants were Caucasian or European in origin (61.8%) with Asian or Asian-Americans constituting an additional 24.5% of the sample; other ethnic backgrounds accounted for the other 13.7%. Most participants (62.2%) were men, 37.3% were women, and one participant reported being transgendered.

Differences between the three recruitment groups (message boards with no potential compensation, message boards with potential compensation in the form of a gift card, and MTurk) were analyzed and are outlined in Table 2. There were no statistically significant difference in sex, marital status, or employment status, but the recruitment samples differed in age, racial/ethnic identification, education, and region of the world where the participant lived. Specifically, the MTurk sample included significantly more participants of an Asian background whereas the message board samples were both predominantly Caucasian and European; as might be expected in light of this finding, the MTurk group also was more strongly Asian-focused in region of habitation versus the message board groups, which were more North American or European based. The message boards attracted older participants on average whereas a majority of the MTurk recruitment sample (51.1%) was under the age of 30.
Measures

**Gaming Experiences Questionnaire** (see Appendix D). This measure was designed specifically for this study as a way to gather information about each participant’s game and avatar involvement. The Gaming Experiences Questionnaire asked participants about their MMORPG experiences, including what games they play, how long they have played MMORPGs, their involvement in in-game guilds, and their motivations for playing. This questionnaire also included several questions about the gamer’s avatar, including how much time he or she spent customizing the avatar and how many avatars he or she currently plays. This data was qualitative in nature and was gathered to better understand the gaming habits of the participants in this sample.

**Big Five Inventory-44** (BFI-44; John, Naumann, & Soto, 2008, see Appendix E). The BFI-44 was used to assess participants’ self-description of their personality characteristics and those of that player’s avatar, employing a strategy used by Trepte and Reinecke (2010). The BFI-44 is a shortened (44 item) version of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992), and measures the Big Five personality traits: Openness to Experience, Conscientiousness, Agreeableness, Extraversion, and Neuroticism. Respondents rate 44 personality attributes using a five-point Likert scale ranging from 1 = “disagree strongly” to 5 = “agree strongly” (Rammstedt & John, 2007). The BFI-44 is a widely used instrument that has been shown to have adequate psychometric properties; its test-retest reliability was .84 with 71% stable variance and the convergent validity of the BFI-44 with the NEO-PI-R was .78 for the full scales (Rammstedt & John).

After responding to the BFI-44 by rating their own characteristics, participants were asked to rate the personality factors of the avatar that they played the most over the course of the
past month (see Appendix F). While Trepte and Reinecke (2010) used the BFI-10 (a shortened version of the BFI-44) to create their avatar identification scales, the BFI-44 was used in the current because of its stronger psychometric properties (Rammstedt & John, 2007).

In order to establish the three groups of avatar identification, the self-reported scores for each BFI-44 category (Openness, Extraversion, Agreeableness, Conscientiousness, and Neuroticism) were subtracted from the respective category scores for the avatar personality, using the same general approach used by Trepte and Reinecke (2010). Because these groups have not been examined in this manner with this particular instrument before, there is no standard for how to identify levels of identification. The potential score ranges were from -176 to +176; the observed range in this sample was -57 to +33. The participants were divided roughly into thirds to establish the different avatar identification groups. Scores ranging from +33 to +6 were assigned to the Positive Self Attributes avatar identification group, scores ranging from +5 to -5 were assigned to the Similar Avatar-Self Attributes group, and scores ranging from -6 to -57 were assigned to the Positive Avatar Attributes group.

**Player-Avatar Identification Scale** (PAIS; Li, Liau, & Khoo, 2013; see Appendix G). The PAIS measures a gamer’s identification with his or her avatar by rating 23 items on a five-point Likert scale with 1 = “strongly disagree” to 5 = “strongly agree” on four domains believed to be indicative of avatar identification: feeling during play, absorption during play, positive attitudes towards the avatar, and importance to identity (Li et al.). These domains are roughly equivalent with the domains outlined in Cohen’s (2001) theory of identification with media characters. The PAIS is a new scale that was normed on adolescents in Singapore. While it has not been used in other studies to date, the PAIS was chosen to be used in an international sample due to the lack of any other specific player-avatar identification scales. It has shown promising
convergent and discriminant validity (Li et al.), and good construct reliability between 0.68 and 0.84 across the four factors (Li et al.).

**MMORPG Addiction Rating Scale** (Hsu et al., 2009; see Appendix H). This is a six-item scale designed to measure feelings of withdrawal, loss of time when engaging in the addictive activity, conflict as a result of engaging in the activity, tolerance, incidents of relapse, and the inability to control one’s activities associated with the activity. It was adapted from an online game addiction measurement created by Chou & Ting (2003). Participants rate the items on a five-point Likert scale with 1 = “strongly disagree” to 5 = “strongly agree” (Hsu et al.), and it yields a total score, ranging from 6 to 30, which has been used as a measure of game addiction. It has been found to have high internal consistency (Cronbach’s alpha = 0.901), which suggests good construct reliability (Chou & Ting). Although the items are high in face validity, other forms of validity have not been formally evaluated.

**Gaming Habits Diary** (see Appendix I). This measure was designed for the current study and asked participants to recall their game play for the past week, including how many hours they recall playing on each day and what times of day they were in game.

**Demographics Questionnaire** (see Appendix J). Basic personal information about the participants, such as age, race, nationality, gender identification, highest level of education completed, current marital status, and current employment status was gathered through a demographics questionnaire designed specifically for the present study.

**Procedure**

Xavier University’s Institutional Review Board (see Appendix K) approved this study. A virtual “flyer” was posted on several online MMORPG forums, both general and game-specific forums, in an effort to recruit participants. People who were 18 years or older and currently
played at least one MMORPG were invited to participate. Those who chose to take part in the study were directed to an online questionnaire site. The participants read an online informed consent form and checked a box on the online form signifying that they read and agreed to the terms of the study.

Participants were initially offered no compensation for completing the survey. The original recruitment flyers were posted for approximately a year on 28 different message boards, although four of these did not remain up for an entire year because the game forums was shut down or restructured in a manner that resulted in the posting being removed. Due to insufficient respondents being gathered after 14 months of posting, gamers recruited from the forums were offered the chance to win one of ten $10.00USD gift cards; individuals on the MTurk service were compensated $0.25 for a successfully completed survey.

Regardless of the method of recruitment, participants accessed the study materials through Survey Gizmo. They first read an online consent form; if they checked a box indicating that they had read and agreed to the terms of the study, participants were then given the demographics questionnaire to complete along with the gaming experiences questionnaire. The following forms were counterbalanced to control for order effects. Participants were asked to complete the BFI-44 twice, once for themselves and a second time for the avatar they had played the most over the past month. Participants were asked to complete the MMORPG addiction rating scale. Participants were also asked to complete the gaming habits diary in order to provide information on their gaming habits over the past week. Upon completion of all of the measures, participants were given a debriefing statement that provided a short description of the study.
Results

The primary aim of the study was to examine possible differences in MMORPG Addiction Rating Scale scores across the three levels of Avatar Identification, as derived by a comparison of the BFI-44 scores (Self vs. Avatar). The means and standard deviations of the MMORPG Addiction Rating Scale scores by avatar identification groups are presented in Table 3, along with the results of a one-way analysis of variance (ANOVA). There was no statistically significant difference between groups, \( F(2, 230) = 0.35, p = .70 \).

A second one-way ANOVA examined possible differences in the number of hours spent playing MMORPGs per week across the three levels of avatar identification, as measured by the Gaming Habits Diary. The means and standard deviations on the number of hours reported by participants in the gaming diary, and the \( F \) value from the ANOVA are presented in Table 4. There was no statistically significant difference between groups, \( F(2, 230) = 0.47, p = .63 \).

Five one-way ANOVAs were computed to test possible differences in the Self BFI-44 scale scores (Openness, Conscientiousness, Agreeableness, Neuroticism, and Extraversion) across the three avatar identification groups. The means and standard deviations by group are presented in Table 5, along with the \( F \) values. Given the number of analyses computed, a Bonferroni correction was computed, which resulted in a recommended \( p \) level of .01 for statistical significance. Whereas the groups did not differ on Conscientiousness, \( F(2, 230) = 1.97, p = .14 \), Neuroticism, \( F(2, 230) = 1.00, p = .37 \), Agreeableness, \( F(2, 230) = 3.60, p = .03 \), or Openness, \( F(2, 230) = 4.01, p = .02 \), there was a statistically significant difference between groups on Extraversion, \( F(2, 230) = 11.77, p = .001 \).

Tukey post-hoc tests showed significant differences on the Extraversion scale between the Positive Self-Attributes group and the Similar Attributes group (\( p = .001 \)) and Positive
Avatar Attributes group \( (p = .001) \). The Positive Avatar Attributes group and the Similar Avatar-Self Attributes group did not differ on the Extroversion scores \( (p = .98) \).

Multiple linear regressions were calculated to predict MMORPG addiction scale scores based on the personality characteristics of the gamer as captured by the BFI-44 factor scores; the results are presented in Table 6. A significant regression equation was found, \( F (5, 227) = 3.85, p = .002 \), with a \( R^2 = .08 \). The predicted MMORPG addiction scale scores of the participants is equal to \( 9.99 + 1.50 \) Extraversion \( + 0.538 \) Agreeableness \( + 1.64 \) Neuroticism \( + 0.30 \) Openness. Conscientiousness was not in this regression formula due to its low predictive power. Only Extraversion \( (p = .02) \) and Neuroticism \( (p = .001) \) were found to be statistically significant predictors of MMORPG addiction scale scores, which means the predicted MMORPG addiction scale scores will increase with higher Extraversion and higher Extraversion factor scores.

Multiple linear regressions were calculated to predict number of hours played per week based on the personality characteristics of the gamer as captured by the BFI-44 factor scores. No significant regression equation was found, \( F (5, 227) = 2.14, p = .06 \), with a \( R^2 = .05 \). Only Openness was found to be a statistically significant predictor of hours played per week \( (p = .004) \).

Table 7 presents the correlations among the primary scores of the self-reported BFI-44, the avatar-assigned BFI-44, \( r = .65, p = .001 \), and the PAIS, \( r = .29, p = .001 \). The avatar-assigned BFI-44 scores were also significantly correlated with the PAIS, \( r = .41, p = .001 \). The total differences between the BFI-44 reports for the participant and for his or her avatar were significantly correlated with the PAIS, \( r = .16, p = .02 \). The PAIS was also significantly correlated with the total MMORPG addiction scale scores, \( r = .50, p = .001 \).
Discussion

As millions continue to play MMORPGs for 24 to 26 hours per week (Griffiths et al., 2004; Williams et al., 2008), examining the factors associated with this game play may provide researchers with more information as to why MMORPGs played at a higher rate than console games. Because the creation and use of one’s own avatar in MMORPGs is a unique facet of these games, this feature may influence or account for these gaming habits.

Based on previous findings that showed higher avatar identification led to more enjoyment playing and higher addiction scores, it was expected that there would be differences on the MMORPG Addiction Rating Scale scores and number of hours spent each week playing MMORPGs, but the findings from this sample did not support those hypotheses. The failure to find differences may be a function of the distribution of the Avatar-Self Identification scores. Specifically, given the range of scores on the BFI-44, the possible Identification scores are -176 to +176. In this sample, however, the range was much more restricted, as the scores were between -57 to +33, with 152 (65.24%) of the 233 participants’ scores falling between -10 and +10. It is possible the discrepancies between the three groups were not wide enough to provide statistically significant results. Future researchers may consider using different measures to determine avatar identification groups, especially as specific scales, such as the PAIS, are being developed for MMORPG research.

The restricted range of scores upon which to establish the three avatar identification groups may also have accounted for the failure to find differences across groups in the number of hours spent playing MMORPGs per week. It is also possible that the self-reported hours spent playing were not an accurate representation. Two previous MMORPG studies have given researchers access to server data, which is computer-logged information about how many hours a
gamer has played per week, along with the gamer’s self-report. In both, the researchers found that gamers underreported their game-play by one to three hours a week, a statistically significant difference between perceived game-play and actual time spent in game (Kahn, Ratan, & Williams, 2014; Williams, Consalvo, Caplan, & Yee, 2009). Participants may have under- or overestimated hours spent in game, which could have contributed to the failure to find statistically significant differences.

Overall, participants in this study reported playing from zero hours up to 128 hours during the previous week, with the overall average at 23.5 hours played in the previous week, slightly less than the average of 24 to 26 hours reported in other MMORPG studies (e.g., Griffiths et al., 2004; Williams et al., 2008). A majority (68.2%) stated their reported weekly average was “typical” of their game play experience while 11.6% typically played slightly or significantly less than reported and 20.2% typically played slightly or significantly more than reported. These reports indicate the gamers in this study represent the typical play habits of gamers in other MMORPG studies, on average.

Although the identification groups did not differ on measures that might indicate problematic gaming, there was a statistically significant difference on one of the BFI-44 scores. However, given that the BFI-44 served as the basis for the Identification groups, some differences are not surprising. Specifically, there were differences between the Positive Self Attributes group and the Positive Avatar Attributes group for the participant’s reported Extraversion BFI-44 scores, which indicated that the Positive Self Attribute group was more outgoing, social, and energetic. Future researchers may wish to continue exploring personality factors in a manner that would be less confounding than the method set forth in this study in order to better understand the ways in which avatar identification might impact gaming habits.
The multiple linear regression calculated to predict MMORPG addiction scale scores based on the personality characteristics of the participant identified Extraversion and Neuroticism as statistically significant predictors of MMORPG addiction scale scores. The social aspect of MMORPGs is often lauded as a critical aspect of these online games and has been cited as a favorite feature of these games by both adolescents and adults (Griffiths et al., 2004). It is possible that individuals with more extraverted traits, such as being talkative and enjoying the company of others rather than being alone, turn to these games for social contact during leisure time in order to fulfill these more extraverted desires. In this study, 146 of 233 participants listed being social or playing with others as a motivation for playing with 63 (43.2%) of those participants identifying it as their primary motivation for playing.

On the other hand, persons who report higher neuroticism, or the tendency to experience negative emotional states such as anger or depression, may play MMORPGs in order to alleviate these potential or real negative mood states. Hussain and Griffiths (2009) surveyed gamers who said playing MMORPGs helped to alleviate negative feelings, such as stress, anger, boredom, and frustration. The ability to “escape” the real world, to work towards achievements, and engage with others in what has been hypothesized to be a more anonymous, therefore safer, environment are all likely factors contributing to increased game play. In this study, 119 of the 233 participants listed escaping from the real world as a motivation for playing with 36 of those participants identifying it as their primary motivation for playing.

There was not a significant regression to predict number of hours played per week based on the BFI-44 scores, although the Openness score was statistically significantly correlated with hours played per week. MMORPGs may draw persons with high levels of Openness, which is defined by a willingness to engage in new experiences, curiosity, and imagination, due to their
unique style of play and expansive environments. Gamers surveyed by Hussain and Griffiths (2009) identified being able to use their imaginations and learning about other cultures by playing with international individuals as two of the benefits of playing MMORPGs, both of which are consistent with the trait of Openness. It is possible persons with higher scores on this personality trait play more hours per week than persons with lower scores on the trait of Openness in order to expose themselves to new experiences, interact with a more diverse range of individuals, and engage their imaginative minds in unique and unusual environments.

Although the gamers in this sample reported playing MMORPGs at a level that is similar to that reported in other studies, it is likely the current sample differed from MMORPG players in important ways, that therefore is not representative of the population MMORPG players and therefore, may not be generalizable. For one, recruitment advertisements were posted on forums, most of which were either based in the United States or English-speaking European message boards, and on MTurk. Due to language barriers and inability to navigate foreign sites as a result, a large number of international message boards were not utilized for recruitment, limiting the participants. While a large number of Asian participants were recruited through MTurk, these participants were mostly from India, whereas a significant number of gamers in Asia are from China and South Korea (Millward, 2014; Cain, 2010).

Not every person who plays a MMORPG utilizes the message boards and forums of the game they play. It is quite possible that the gamers who choose to utilize these forums may have different personality factors than the average gamer, such as being more extraverted and social or being more open and curious. There is no research comparing gamers who tend to use message boards versus those who do not, which may be an area for further study.
Finally, of note with this study, the PAIS was found to be significantly correlated with the avatar identification groups established by using the BFI-44 scores. The scale was also significantly correlated with the MMORPG addiction scale scores (0.50). At the time this study began, the PAIS had only been normed on Singapore adolescents and was not used in any MMORPG research. Its significant correlations with an established means of calculating avatar identification (using Big Five Inventory personality factors) and MMORPG addition scale scores indicates promising usage of this scale in future MMORPG research. In addition, the PAIS appears to be able to be more generalized to an adult and more international sample than what it was normed upon. Future researchers may wish to continue utilizing this scale as it is less cumbersome and more focused on the interaction between player and avatar than the standard practice of obtaining Big Five Inventory personality factors for both players and avatars.

A major limitation of this study is the reliance on self-report data, which, as mentioned above, can misrepresent actual game play. Future research in this area may consider confirming the hours played by each gamer by working with video game companies in order to obtain server data. This study also relied on multiple avatar identification methods to reflect both past approaches and an attempt to utilize a new scale that was attempting to standardize and operationalize how to determine avatar identification. The use of several different scales presented a challenge for data gathering, as some respondents commented that the survey was “too long,” resulting in numerous partial surveys. As measures like the PAIS continue to be developed and validated for use in this area of research, surveys can be more streamlined or made more concise in order to counter some participant fatigue, hopefully resulting in more respondents and data available.
Research of MMORPG addiction and avatar identification is a nascent and fast-growing area. There are numerous facets to explore in this underdeveloped, poorly understood area of entertainment. The ongoing development of standardized instruments or protocols for examining and gathering data amongst this large but unexplored population, such as the PAIS, will continue to help researchers better understand the benefits and challenges of playing MMORPGs.
References


doi:10.1089/cpb.2007.9988


Table 1

Demographic Characteristics of the Overall Sample and by Recruitment Method.

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<tr>
<th></th>
<th>Overall (n = 233)</th>
<th>MTurk (n = 137)</th>
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<th>Gift Card (n = 17)</th>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>62.2%</td>
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<tr>
<td>Female</td>
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<td>0.0%</td>
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<td>48.9%</td>
<td>79.7%</td>
<td>82.4%</td>
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<td>Asian/Asian-American</td>
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<td></td>
<td></td>
<td></td>
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<td>40.5%</td>
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<td></td>
<td></td>
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<tr>
<td>Single/Never Married</td>
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<td>43.8%</td>
<td>51.9%</td>
<td>23.5%</td>
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<td>Married</td>
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<td>Divorced</td>
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<td>4.4%</td>
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<tr>
<td>Widow</td>
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<td>Live as Married</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Part-time Student</td>
<td>2.1%</td>
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<td>2.5%</td>
<td>0.0%</td>
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<tr>
<td>Full-time Student</td>
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<tr>
<td>Unemployed</td>
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<td>1.3%</td>
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</tr>
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<td>Other</td>
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<td>11.4%</td>
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### Ages:

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<td>0.7%</td>
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<tr>
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<td>8.9%</td>
<td>32.9%</td>
<td>25.3%</td>
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<td>12.7%</td>
<td>1.3%</td>
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<td></td>
<td>41.2%</td>
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<td>5.9%</td>
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</table>
Table 2

*Differences in Recruitment Groups.*

<table>
<thead>
<tr>
<th></th>
<th>MTurk</th>
<th>No Gift Card</th>
<th>Gift Card</th>
</tr>
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<tr>
<td></td>
<td>$M \ (SD)$</td>
<td>$M \ (SD)$</td>
<td>$M \ (SD)$</td>
</tr>
<tr>
<td>Age</td>
<td>30.72 (7.73)$^{a,b}$</td>
<td>34.39 (12.49)$^b$</td>
<td>42.82 (11.22)$^a$</td>
</tr>
<tr>
<td>Education</td>
<td>4.54 (1.09)$^a$</td>
<td>3.90 (1.03)$^b$</td>
<td>4.82 (0.95)$^a$</td>
</tr>
<tr>
<td>Race</td>
<td>$X^2 = 49.77^{a,b}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>World Region</td>
<td>$X^2 = 71.82^{a,b}$</td>
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<td></td>
</tr>
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</table>

Note: $^a$ significantly different from No Gift Card group $\leq .05$; $^b$ significantly different from Gift Card group $\leq .05$
Table 3

*MMORPG Addiction Ratings across Avatar Identification Groups*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Avatar Attributes</td>
<td>14.21</td>
<td>4.76</td>
<td>0.35</td>
<td>.70</td>
</tr>
<tr>
<td>Similar Avatar-Self Attributes</td>
<td>14.80</td>
<td>4.62</td>
<td></td>
<td></td>
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<tr>
<td>Positive Self Attributes</td>
<td>14.35</td>
<td>4.96</td>
<td></td>
<td></td>
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</table>
Table 4

*Hours Played Per Week across Avatar Identification Groups*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
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<tr>
<td>Positive Avatar Attributes</td>
<td>22.13</td>
<td>13.91</td>
<td>0.47</td>
<td>.63</td>
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<tr>
<td>Similar Avatar-Self Attributes</td>
<td>24.16</td>
<td>18.86</td>
<td></td>
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<tr>
<td>Positive Self Attributes</td>
<td>24.48</td>
<td>15.77</td>
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</table>
Table 5

*Self BFI-44 Scores across Avatar Identification Groups*

<table>
<thead>
<tr>
<th></th>
<th>Positive Avatar</th>
<th>Similar</th>
<th>Positive Self</th>
<th>F</th>
<th>p</th>
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</thead>
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<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>3.25 (0.79)</td>
<td>3.27&lt;sup&gt;a&lt;/sup&gt; (0.80)</td>
<td>2.66&lt;sup&gt;a&lt;/sup&gt; (0.92)</td>
<td>11.77</td>
<td>.001</td>
</tr>
<tr>
<td>Openness</td>
<td>3.95&lt;sup&gt;b&lt;/sup&gt; (0.54)</td>
<td>3.85 (0.64)</td>
<td>3.63&lt;sup&gt;b&lt;/sup&gt; (0.84)</td>
<td>4.01</td>
<td>.02</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>3.90&lt;sup&gt;b&lt;/sup&gt; (0.72)</td>
<td>3.75 (0.72)</td>
<td>3.57&lt;sup&gt;b&lt;/sup&gt; (0.79)</td>
<td>3.60</td>
<td>.03</td>
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<tr>
<td>Conscientiousness</td>
<td>3.71 (0.74)</td>
<td>3.74 (0.72)</td>
<td>3.50 (0.88)</td>
<td>1.97</td>
<td>.14</td>
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<tr>
<td>Neuroticism</td>
<td>2.73 (0.88)</td>
<td>2.56 (0.92)</td>
<td>2.75 (1.08)</td>
<td>1.00</td>
<td>.37</td>
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</table>

Note:  
<sup>a</sup> significantly different at .001;  
<sup>b</sup> significantly different at .02
Table 6

Linear Regression of BFI-44 Scores and MMORPG Addiction Ratings

<table>
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<th>Dependent Variable</th>
<th>Predicting Variable</th>
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<th>SE b</th>
<th>β</th>
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<td>Neuroticism</td>
<td>1.64</td>
<td>0.47</td>
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<td></td>
<td>Extraversion</td>
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<td>.02</td>
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<td>Self BFI-44 Total</td>
<td>-0.04</td>
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<td>Agreeableness</td>
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<td></td>
<td>Openness</td>
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</table>
Table 7

*Pearson Product Moment Correlations between Measures*

<table>
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<th>Avatar BFI-44</th>
<th>Differences</th>
<th>Addiction</th>
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<td>Avatar BFI-44</td>
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<td></td>
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<tr>
<td>BFI-44 Differences</td>
<td>-0.37*</td>
<td>0.46*</td>
<td></td>
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<tr>
<td>Addiction Total</td>
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<td>0.06</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>PAIS Total</td>
<td>0.29*</td>
<td>0.41*</td>
<td>0.16*</td>
<td>0.50*</td>
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</table>

*Note. *p ≤ 0.05*
Appendix A

No Incentive Message Board Recruitment Posting

Fellow gamers,

If you are currently playing at least one MMO, you are invited to take part in a survey that could potentially help researchers better understand our community. As a fellow gamer, I recognize that there are a lot of negative misconceptions about us, and I’m conducting this study in hopes of helping the psychology community better understand who we are and why we play. This research is focusing on the role that the avatars we play may have on our gaming habits. If this sounds interesting to you and you have approximately 15 to 20 minutes to fill out some surveys, please click on the link below to learn more about the study and to participate.

Thank you for your consideration,
April Sutton, M.A.
Appendix B

Incentive Message Board Recruitment Posting

Fellow gamers,

If you are currently playing at least one MMO, you are invited to take part in a survey that could potentially help researchers better understand our community. As a fellow gamer, I recognize that there are a lot of negative misconceptions about us, and I’m conducting this study in hopes of helping the psychology community better understand who we are and why we play. This research is focusing on the role that the avatars we play may have on our gaming habits.

If this sounds interesting to you and you have approximately 15 to 20 minutes to fill out some surveys, please click on the link below to learn more about the study and to participate. Upon completion of the survey, you will have the option to enter your email address in order to enter a random drawing for a $10.00 (US Dollar) gift card. Ten participants will be chosen. You will have approximately a one in 15 chance of winning a gift card.

Thank you for your consideration,
April Sutton, M.A.
Fellow gamers,

If you are currently playing at least one MMO, you are invited to take part in a survey that could potentially help researchers better understand our community. As a fellow gamer, I recognize that there are a lot of negative misconceptions about us, and I’m conducting this study in hopes of helping the psychology community better understand who we are and why we play. This research is focusing on the role that the avatars we play may have on our gaming habits.

If this sounds interesting to you and you have approximately 15 to 20 minutes to fill out some surveys, please click on the link below to learn more about the study and to participate. Your survey will be reviewed for completion, which will result in $0.25 bonus fee if all required questions have been answered.

Thank you for your consideration,
April Sutton, M.A.
Appendix D

Gaming Experiences Questionnaire

Please answer the following questions regarding your overall MMORPG involvement.

1. I currently play at least one MMORPG.
   a. True
   b. False

2. Are you currently active in any guilds, leagues, organizations, etc., in your MMORPG?
   a. Yes
   b. No

3. If yes, how is your guild best classified?
   a. Raiding
   b. Role-playing
   c. Leveling
   d. Social
   e. Player-versus-player
   f. All purpose
   g. Alt
   h. Other (please specify)

4. In the past year, I have played _____ MMORPGs.

5. The MMORPGs I currently play are ________________.

6. My favorite MMORPG is ________________.

7. How much money have you spent on your gaming in the past year?
   a. $0 to $25
   b. $25 to $50
   c. $50 to $100
   d. $100 to $200
   e. $200 to $350
   f. Over $350

8. How many months have you played MMORPGs?

9. Do you play with “real-world” friends when you play?
   a. Yes
   b. No
   c. Sometimes

10. What is your favorite component of the game?

11. What is your least favorite component of the game?

12. Have you ever sacrificed any of the following to play? (Check all that apply)
   a. Other hobbies
   b. Going to work
   c. Going to school
   d. Sleep
   e. Socializing outside of game
   f. Other (please specify)
   g. None of the above apply to me
13. What are your motivations for playing MMORPGs? (Check all that apply)
   a. Being social/playing with others
   b. Role playing
   c. Learning/understanding the mechanics of the game
   d. Escaping from the real world
   e. Enjoy progression/advancing in the game
   f. Gold farming
   g. Crafting
   h. Exploring the environment
   i. Competing with others
   j. Trolling/griefing other players

14. Which of the above would you consider your primary motivation for playing?
   a. Being social/playing with others
   b. Role playing
   c. Learning/understanding the mechanics of the game
   d. Escaping from the real world
   e. Enjoy progression/advancing in the game
   f. Gold farming
   g. Crafting
   h. Exploring the environment
   i. Competing with others
   j. Trolling/griefing other players

Please answer the following questions about your avatars.
1. Currently, I have ________ avatars that I actively play.
2. The avatar I have played the most in the past month is:
   a. Male
   b. Female
   c. No gender
3. Have you ever done any of the following in regards to your avatar? (Check all that apply)
   a. Written fiction about your avatar
   b. Created an in game biography about your avatar
   c. Made or commissioned artwork about your avatar
   d. Dressed as your avatar outside of game
   e. Engaged in other creative activities related to your avatar outside of game (specify below)
4. How much time do you spend customizing your avatar?
   a. None at all
   b. Very little
   c. Some
   d. Good deal of time
   e. Great deal of time
Appendix E

Avatar Identification Scale—Person

Appendix F

Avatar Identification Scale—Avatar

Appendix G

Player-Avatar Identification Scale

Appendix H

MMORPG Addiction Rating Scale

Appendix I

Gaming Habits Diary

Please answer the following questions in regards to your gaming habits over the past 7 days.

1. In the past week, I played _____ hours on day 1.
2. On day 1, I played during the following times (check all that apply):
   a. Late night (12am to 6am)
   b. Morning (6am to 12pm)
   c. Afternoon (12pm to 6pm)
   d. Evening (6pm to 12am)
3. In the past week, I played _____ hours on day 2.
4. On day 2, I played during the following times (check all that apply):
   a. Late night (12am to 6am)
   b. Morning (6am to 12pm)
   c. Afternoon (12pm to 6pm)
   d. Evening (6pm to 12am)
5. In the past week, I played _____ hours on day 3.
6. On day 3, I played during the following times (check all that apply):
   a. Late night (12am to 6am)
   b. Morning (6am to 12pm)
   c. Afternoon (12pm to 6pm)
   d. Evening (6pm to 12am)
7. In the past week, I played _____ hours on day 4.
8. On day 4, I played during the following times (check all that apply):
   a. Late night (12am to 6am)
   b. Morning (6am to 12pm)
   c. Afternoon (12pm to 6pm)
   d. Evening (6pm to 12am)
9. In the past week, I played _____ hours on day 5.
10. On day 5, I played during the following times (check all that apply):
    a. Late night (12am to 6am)
    b. Morning (6am to 12pm)
    c. Afternoon (12pm to 6pm)
    d. Evening (6pm to 12am)
11. In the past week, I played _____ hours on day 6.
12. On day 6, I played during the following times (check all that apply):
    a. Late night (12am to 6am)
    b. Morning (6am to 12pm)
    c. Afternoon (12pm to 6pm)
    d. Evening (6pm to 12am)
13. In the past week, I played _____ hours on day 7.
14. On day 7, I played during the following times (check all that apply):
    a. Late night (12am to 6am)
    b. Morning (6am to 12pm)
    c. Afternoon (12pm to 6pm)
d. Evening (6pm to 12am)
15. Were your answers on the above questions typical of your average weekly game play?
   a. Yes, those are my typical game play habits.
   b. No, I typically play significantly more.
   c. No, I typically play slightly more.
   d. No, I typically play significantly less.
   e. No, I typically play slightly less.
Appendix J

Demographics Questionnaire

1. I am _____ years old.

2. I identify my gender as:
   a. Male
   b. Female
   c. Transgendered

3. I identify my race/ethnicity as:
   a. Caucasian/European-American
   b. African-American/Black
   c. Hispanic/Latino/Latina
   d. Asian/Asian-American
   e. Native American
   f. Multi-racial/Bi-racial
   g. Other (please specify)

4. The highest level of education I have completed is:
   a. Grade school
   b. Middle school
   c. High school/GED
   d. Associate’s degree
   e. Bachelor’s degree
   f. Master’s degree
   g. Doctoral degree

5. My current marital status is:
   a. Single/never married
   b. Married
   c. Separated
   d. Divorced
   e. Widowed
   f. In committed partnership/living as married
   g. Other (please specify)

6. My current employment status is (choose the most accurate option):
   a. Part-time student
   b. Full-time student
   c. Part-time employment
   d. Full-time employment
   e. Homemaker
   f. Military
   g. Unemployed
h. Retired
i. Disabled/unable to work
j. Other (please specify)

7. I currently reside in: (Inclusive country list was provided)
March 18, 2014

April G. Sutton
Elet Hall
Xavier University

Re: Protocol #13-069, *Avatar Identification and Its Effects on MMORPG Game Play*

Dear Ms. Sutton:

The IRB has reviewed the materials regarding your study, referenced above, and has determined that it meets the criteria for the Exempt from Review category under Federal Regulation 45CFR46. Your protocol is approved as exempt research, and therefore requires no further oversight by the IRB.

If you wish to modify your study, including the addition of data collection sites, it will be necessary to obtain IRB approval prior to implementing the modification. If any adverse events occur, please notify the IRB immediately.

Please contact our office if you have any questions. We wish you success with your project!

Sincerely,

Morell E. Mullins, Jr., Ph.D.
Chair, Institutional Review Board
Xavier University

MEM/sb

C: Kathy Hart, Advisor
Summary

Title: Avatar identification and its effects on MMORPG game play

Problem. While researchers have found the average massively multiplayer online role-playing games (MMORPG) gamer plays between 24 and 26 per week on average (Griffiths et al., 2004; Williams et al., 2008), little research has been done in this area to better understand why people dedicate significantly more time to these online games over traditional console games. One unique aspect of MMORPGs that has garnered some attention is the ability to create and play an individualized character, known as an avatar. Studies have begun to examine what, if any, role a gamer’s connection, or identification, with his or her avatar may have on game play habits.

Method. This study collected data from online MMORPG forums and through Amazon’s Mechanical Turk service over the course of approximately 16 months using the online survey tool, Survey Gizmo. Overall, 233 active adult gamers responded. The mean age of this group was 32.85 with a range from 18 to 72 years. Ethnic breakdown was 61.8% Caucasian/European, 24.5% Asian/Asian-American, and 13.7% other ethnicities.

Participants were divided into three levels of avatar identification based on the discrepancies between their self-reported personality characteristics as well as the personality characteristics of his or her avatar.

Findings. There were no statistically significant differences between the three avatar identification groups on the MMORPG Addiction Rating Scale or hours spent gaming per week. For self-reported personality characteristics, there was a statistically significant difference between the groups on the trait of Extraversion. A significant regression equation was also found when using the personality characteristics of the gamer to predict MMORPG addiction scale scores with Extraversion and Neuroticism as statistically significant predictors of addiction scores. Openness was found to be a statistically significant predictor of hours player per week.
The Player-Avatar Identification Scale (PAIS), a newly developed instrument for measuring this construct, was significantly correlated with the avatar identification scores calculated using personality discrepancies as well as with the total MMORPG addiction scale scores.

*Implications.* The results of this study suggest personality factors, while they may be helpful in partially predicting addiction scores or hours played per week, may not be the best practice in assessing avatar identification. With the development of the PAIS, measuring avatar identification could be less time-consuming and cumbersome for the participants to respond to and more face valid.