PERSONALITY DIFFERENCES BETWEEN ONLINE
GAME PLAYERS AND NON-PLAYERS

A Thesis
Presented
to the Faculty of
California State University, Chico

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Psychology
Psychological Science Option

by
Hector E. Topete
Spring 2010
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DEDICATION

I truly appreciate everybody who was helped me throughout this entire thesis project. I primarily want to extend my gratitude to Dr. Lawrence Herringer, my thesis chair. Without his tremendous amounts of help, encouragement, and insight into the fields of personality psychology and statistics, I never would have been able to complete this project. I could not have asked for a more committed and patient chair, as I recall many “short” meetings that turned into sessions lasting hours. I would also like to thank my committee member, Dr. Brian Oppy for his support. He helped bring this research idea to fruition in my first semester as a graduate student. There are also many people who have helped me in a more indirect manner, through their unwavering emotional support outside of the classroom. So, I would like to extend thanks to my mother, Robin Topete, father, Hector Topete Sr., girlfriend Rosie Durling, roommate, Josh Sparks, and all of my other friends that have helped out along the way. Thank you very much, and I love all of you.
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ABSTRACT

PERSONALITY DIFFERENCES BETWEEN ONLINE GAME PLAYERS AND NON-PLAYERS

by

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Master of Arts in Psychology: Psychological Science Option

California State University, Chico

Spring 2010

Massively Multiplayer Online Role-Playing Games have become the fastest growing genre of video gaming throughout the world. Despite the tremendous popularity of online gaming (around 18 million participants), perceptions of online gamers are still surrounded by stereotypes and myths. The purpose of this study was to examine whether or not there are personality differences between these players and non-players. An internet and gaming participation self-report survey was created to gather demographic data, assess how often one plays this type of game, as well as to assess general Internet use. Several other measures were used to assess the Five-Factor Model of personality traits, fantasy proneness, and social desirability. Eight varying hypotheses predicted whether or not there would be differences between gamers and non-gamers. Results showed that there were few, if any, differences between the samples. However, the fairly homogenous sample of participants may have influenced the findings.
CHAPTER I

INTRODUCTION

Today’s society is experiencing a marked shift in the way video games are played. A few years ago, the video gaming experience consisted of a person sitting in front of a game console and television with a controller in their hands. In the early days of video gaming, titles such as *Super Mario Brothers* and *The Legend of Zelda* dominated the marketplace. These traditional games could be completed in as little as a few hours, up to perhaps one day of playtime. This trend then shifted into more advanced gaming consoles, offering a much richer gaming experience. In addition to possessing better graphic capabilities, these newer gaming systems gave the option of saving progress in one’s game of choice. This save option lengthened the time of game completion, and allowed for a more involved video experience. Games could now take days to complete, or in some cases, even weeks. In addition to how increasingly engrossing these video games became, the age of the individuals participating in the activity also increased. The original NES (Nintendo Entertainment System) was considered little more than a child’s toy. However, by the time of the release of the Sony Playstation, the average age of video gamers had risen from approximately ten years old in the late 1980’s to the late teens and early twenties. This trend has continued with the further advancement of gaming consoles, and it is now reported that the average age of console-based video game players is 35 years old (Entertainment Software Association, 2009).
The emergence of and ease of access to the internet has again shifted the overall gaming experience. Now, instead of a person being locked into playing games with a console and television, they possess the ability to use their personal computers to access online games. This aspect has brought about an entirely new genre of game, apart from the traditional platform games that many of us have grown up with. This genre that has unfolded is now known as Massively Multiplayer Online Role-Playing Games, or MMORPG, and has become the fastest growing, most popular trend in the history of video gaming (Internetgames.com, 2009). This genre of computer gaming involves large numbers of people interacting with each other in a pre-created, virtual world. These worlds are predominantly based in a fantasy setting with players having the ability to choose between various races, classes and genders. The goals of an MMORPG are distinctively different from that of a traditional console game. In a traditional console game, the primary goal is to complete the storyline of a given game, but in an MMORPG, the focus is on character development and advancement. In fact, one of the primary features that separates MMORPGs from console games is that there is no “ending” to the game. While each of the various MMORPGs does have a distinct storyline that will guide players in their advancement, there is no “The End” or “Game Over” screen that will appear. Instead, players have the ability to seek out upgraded gear and powers to further develop their given characters.

Character creation is an essential aspect of this genre of gaming. This seems to be an extremely desirable attribute to those attracted to MMORPGs (Riegle, 2006). The initial step of any online role-playing game is to choose various attributes that a
player will desire in the character they will be controlling. There are literally hundreds, if
not thousands, of different possibilities at the time of character creation. These can be
anything from race (Human, Dwarf, Elf, etc.) and class (Warrior, Magic User, Archer,
etc.) of the character, down to the more specific details such as skin color, body-type,
name and abilities. With all of these various options at hand, each character that is
created will have a different look and feel, entirely dependent on the will of the gamer.
These options allow players to express their creativity and originality, which is a huge
drawing point to this style of video game.

Players are often willing to portray a character that is entirely different from
who they are in real life. Hussain and Griffiths (2008) found that the majority (57%) of
gamers have gender-swapped their online persona, or character. This included over half
of men (54%) and two-thirds of women (68%). Some of the reasons given for these
gender-swapping actions were: “It enables me to play around with aspects of my
character that are not normally easy to experiment with in real life”, and “For fun and to
see if it felt any different” (Hussain, 2008, p. 48).

Another aspect that differentiates MMORPGs from traditional video games is
the cooperative, large group context of the genre. Instead of advancing solo through a
game, or with the cooperation of one to two other players, gamers have the unique
opportunity of advancing with hundreds or even thousands of other online participants.
In fact, to experience the end-game content (conclusion of a given storyline) of an
MMORPG (e.g., World of Warcraft), it is required that a player team-up with other
gamers to face in-game challenges that would are impossible on their own. This creates
another appealing aspect of participation: gamers are not limited to playing with others living in close proximity. It is commonplace that a gamer encounters players living on the other side of the country, and in many cases, on the other side of the world. Thus, meeting and interacting with geographically exotic participants may be an additional benefit.

There are currently millions of gamers flocking to this unique genre. The most popular of all MMORPGs currently being played is called World of Warcraft, or WOW. It has been in existence for approximately five years and already boasts over 11 million players worldwide (Blizzard, 2009). World of Warcraft possesses 62% of the market share of all MMORPGs, and there are roughly 18 million people engaged in this genre of gaming (Usposttoday.com, 2009). The lucrative potential of this recreational pursuit has not gone unnoticed. While there are some MMORPGs that allow players to participate free of charge (e.g., Runescape), the more well-known games (e.g., WOW) generally charge a monthly fee for access, usually costing ten to twenty dollars per month. Thus, many dedicated players and occasional participants willingly pay to play.

The numbers of people playing this genre of gaming bring to mind several psychological questions. For instance, are there any differences in personality traits between MMORPG gamers and non-gamers? Are MMORPG gamers more prone to fantasy than non-gamers?

Despite the current popularity of MMORPG participation and the degree to which this is increasing, research on this subject is in its infancy. Given that there are roughly 18 million people playing these games, psychological study is clearly warranted.
Much of the research done on online gaming focuses on negative consequences, such as its addictive potential (Parsons, 2006; Greenfield, 1999; Young 1998). Studies such as these, as well as the media’s view of MMORPGs as a “grave social problem” (Cha, 2007) may be responsible for creating a negative stigma surrounding this genre of gaming and its players. It is not uncommon to hear negative stereotypical terms regarding these players (overweight, lazy, unmotivated). In addition, a meta-analysis done by Anderson, Shibuya, Ihori, Swing, Bushman, Sakamoto, Rothstein, and Saleem (2010) suggest that violent video games are a risk factor for aggression, and for decreased empathy and prosocial behavior.

However, more current research has shown that this is not necessarily the case. Hussain and Griffiths (2009) concluded that MMORPG gamers, contrary to public opinion, are just as conscientious, if not more so, than non-gamers. Allowing an individual to create an avatar (online representation of oneself) in this fantasy environment allows them to be more like their “ideal self”, or somebody who is more outgoing, adventurous, and physically fit (Bessiere, Seay, and Kiesler, 2007). Williams, Yee, and Caplan (2008), using one’s self-reported Body Mass Index, or BMI, as their foundation, found that these gamers are actually in better physical condition than non-gamers. These studies may be the first steps towards dispelling the myths and negative stigmatization surrounding MMORPG gamers. Participating in this type of sociable gaming, instead of the more traditional console based gaming, may be a contributing factor of self-esteem in online gamers.
Funder (2009) emphasizes that personality research is a viable means of assessing intrinsically important psychological characteristics. He urges personality psychologists to focus on what individuals actually do in their everyday lives, primarily studying hobbies and leisure activities. The most widely accepted theory of personality is the Five-Factor model proposed by Costa and McCrae. This theory has come to be known as the Big Five, encompassing openness, conscientiousness, extraversion, agreeableness, and neuroticism. I used the Five-factor model of personality to examine differences associated with varying degrees of participation in Massively Multiplayer Online Role-Playing Games.

To gain an accurate assessment of how participants spend their time online, as well as how much time they spend playing MMORPGs, an internet use questionnaire was developed. This questionnaire covers a wide array of issues, such as general internet use, MMORPG use, demographic data, etc. A frequent bias in any self-report measure is the potential to answer questions in ways that are deemed more appropriate, or socially acceptable. To compensate for this potential problem, I will include a measure of social desirability (Paulhus, 1988). Extreme scores on this measure will show that a participant may not be truthful in the questions that are posed to them.

Fantasy proneness is a construct addressing how extensively and deeply involved a person becomes in fantasy involvement (Merckelbach, 1999). There are many features that are considered to be typical of fantasy proneness. These include spending a large portion of one’s time fantasizing, having fantasies with hallucinatory intensities, reporting vivid childhood memories, and having paranormal or intense religious
experiences (Merckelbach, 2001). To examine this construct in relation to MMORPG participation, I will use the Creative Experiences Questionnaire (Merckelbach, 2001), a measure of fantasy proneness.

This study will address several questions. First, do those who more frequently engage in playing MMORPGs possess different personality types than those who are not active MMORPG gamers? Second, do these gamers possess a greater propensity for fantasy proneness than the non-gamers?
CHAPTER II

LITERATURE REVIEW

Online Gaming

The intangible world of the internet has changed the way in which we now perceive our everyday lives. The use of post offices are steadily declining as a multitude of people have switched to the use of e-mail for their communication needs. Everyday household bills can now even be paid online, rather than mailing a check or providing credit card information over the phone. The internet is even changing the ways in which we communicate on a day-to-day basis. Sites such as Facebook and Myspace grant us access to freely communicate with friends and family without the use of telephones. Our society truly is shifting to an “e-world”. Mulligan (1999) found that, even a decade ago, between four and six million households had active subscriptions to online services, paving the way for personal and commercial applications of gaming. Currently, there are over 1.8 billion Internet users across the globe (Internet World Stats, 2009).

Many people think that online gaming fills a niche for primarily mid-teen to early twenties males. This is, however, not the case. Online gaming targets a vast age range, from preteens through senior citizens. For instance, Hawn (2007) reported that Club Penguin (an online game for preteens) had four million unique visitors in January of 2007 alone. On the other side of the age spectrum, Cohen (2006) reported that many
senior citizens were visiting gaming sites, especially those described as “brain games”.

Another myth about online gaming is that it is overwhelmingly dominated by males. Only 58 percent of online gamers are male, while 42 percent are female (Entertainment Software Association, 2007). Interestingly, when referring to MMORPGs, Yee (2006) found that 44 percent of male players are 22 years of age younger, compared with 20 percent of female players. This implies that the MMORPG genre is more attractive to females of a higher age group. Taylor (2003, p. 22) states that, “these types of games are offering venues for the interesting exploration of activities typically bounded off from each other – sociability and power, mastery and cooperation – and women are finding dynamic ways to inhabit these mass virtual worlds.”

The emergence of the internet has brought about many forms of online gaming, from gambling websites (poker, blackjack, etc.) to what I described earlier as Massively Multiplayer Online Role-Playing Games (i.e., MMORPGs). What is it that drives so many towards this behavior? With regard to gambling sites, this answer may be obvious: the same idea that drives millions of people into casinos, the chance to win money. However, it becomes more difficult to identify the motivations behind online gaming in which no monetary award is given. Both online gambling and online gaming may be reinforcing because they satisfy a person’s need for mastery and competence (White, 1959). A person’s transformation during online gaming can be linked to the feelings of mastery felt by athletes, where they can accomplish feats unattainable on a real playing field (Turkle, 1995). Also, engagement may be a strong motivator for online gaming. Generally, a game that extends for weeks or months (and in the case of a few
MMORPGs, years) is usually very complex or difficult. MMORPGs are unique in this way, as they are comprised of many, smaller challenges that must be overcome.

Completing each of these tasks will provide a player with immediate reinforcement, which will, in turn, prolong their gaming experience. When players are consistently confronted with increasingly more difficult challenges, they tend to build close-knit “communities” to discuss or receive aid for these challenges (Freddolino, 2007). Online games provide a balance of challenges and cooperation with other players. Therefore, it is likely that people subscribe to this genre of gaming to receive a challenge, while at the same time attaining a feel of recreation. Freddolino (2007) states that online gaming forces gamers into talking to one another, which is an instinctive human need for social interaction (Freddolino, 2007). Within the MMORPG world, there are essentially three types of game play: raiding, player vs. player, and leveling. Raiders require constant cooperation with other online gamers to fulfill quests and/or dungeons. A quest usually consists of a challenge in which a player must overcome to gain a reward, while a
dungeon refers to an in-game situation in which only a character’s group is allowed entry. This is usually how players acquire better gear/items for their online characters, which is how they are then able to experience what is known as “end-game” content. It is literally impossible for a player to experience this content or gain these gear/items by themselves.
Player vs. player (PVP) is the act of gamers immersing themselves in virtual combat against one another. This can be done as group or solo combat. Levelers are the players who usually have many different avatars (essentially, characters; a computer user's online representation of himself/herself or alter ego) in one game, with the sole purpose
of advancing their characters to the maximum level of the given game. They do not generally focus on aspects such as raiding or PVP.

**Personality and Everyday Activities**

According to Costa & McCrae (1992), a personality trait is the sustained and consistent characteristic reaction of an individual under different situations. “These personality traits are stable and extremely important individual life compositions” (Costa & McCrae, 1992). A basic premise of personality psychology is that “the fundamental goal of all personality theories is to describe and account for regularities in individuals’ actions, broadly conceived, occurring throughout the natural stream of everyday conduct” (Buss & Craik, 1986).

The most widely accepted theory of personality is Costa and McCrae’s Five-Factor model, also known as the Big Five. The Five Factor Model posits five distinct dimensions, applicable to everyone, broadly accounting for all the major differences in personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism. People who exhibit higher levels of extraversion tend to be more sociable, talkative, energetic, and dominant. Conversely, people low on extraversion are considered to be introverted, meaning that they would be more likely to be shy, quiet and submissive. High agreeableness includes being more friendly, trusting, and cooperative, while low agreeableness includes being argumentative, unkind, and difficult to get along with. People that are more cautious, organized, dependable and responsible are higher on the trait of conscientiousness than those who are very impulsive, undependable, careless, and disorderly. People exhibiting high levels of neuroticism have tendencies to be more
nervous, high-strung and tense. Meanwhile, low neuroticism people are more emotionally stable and have characteristics such as being calm and content. Those higher on openness appear to be artistic, creative, and witty, while those who fall lower on this dimension exhibit characteristics such as plainness, simplicity, and shallowness. It is important to mention the fact that the Big Five is primarily based on adult samples. However, De Fruyt, Laroi, and Van der Linden (2000) concluded that it is also an adequate framework for assessing children and adolescents.

Funder (2009) proposed the idea that more psychological research needs to measure interesting and important, yet ordinary, behaviors. He stressed that personality research is key to this, as its variables are constructed to capture intrinsically important psychological characteristics. “Personality research typically employs correlational designs in which the levels of the personality variables are measured as they vary naturally in the participant population at hand and not experimentally manipulated to arbitrary levels” (Funder, 2009, p. 341). He urged personality psychologists to study what people actually do in their lives, not just study behaviors or traits that are easily measured or theoretically popular. Funder repeated advice from Baumeister, Vohs, and Funder (2007, p. 399) to focus our research on natural, unscientific activities such as “helping, hurting, playing, working, taking …” and many others. Studies of hobbies or leisure pursuits would fall into this scheme of important everyday behaviors. Two recent, notable examples of this are a study of personalizing of bedrooms and offices (Gosling, Ko, Manarelli, and Morris, 2002), and a study of personality and individual music preferences (Renfrow & Gosling, 2003).
Gosling, Ko, and Mannarelli (2002) investigated links between the personality traits and two different personalized physical environments, offices and bedrooms. Five-Factor model correlations suggest that an individual’s personal environment will yield more clues for certain traits than others (Gosling et al., 2002). In both experiments involved in this study, the highest accuracy was found for openness to new experiences (e.g., varied books, distinctive vs. ordinary), also showing strong correlations with conscientiousness (e.g., clean vs. dirty, organized vs. disorganized) and extraversion (e.g., noise vs. quiet inside, decorated). Neuroticism (e.g., fresh vs. stale, noise vs. quiet outside) and agreeableness (e.g., inviting vs. repelling, comfortable vs. uncomfortable) showed the least amount of agreement. All of the correlations involved in the bedroom setting were stronger than those in the office setting, probably owing to the greater control and opportunity for personalizing.

In another everyday behavior study, Renfrow and Gosling (2003) explored the relationship of music preferences to the Five Factor Model personality traits, as well as self-views and cognitive abilities. Music preferences were separated into four distinct groups, via factor analysis: reflective and complex, intense and rebellious, upbeat and conventional, and energetic and rhythmic. There were many interesting finding in this study. Openness to new experiences was positively correlated with the reflective and complex dimension, suggesting that individuals who enjoy listening to complex and reflective music tend to have active imaginations, are inventive and value aesthetics. Openness was also positively related to the intense and rebellious dimension. This came as a surprise to the researchers, as they had expected to find associations with neuroticism
and disagreeableness. Rather, these findings supported an idea that those who listen to intense and rebellious music tend to be curious about different things and enjoy taking risks. Extraversion, agreeableness, and conscientiousness were positively associated with the upbeat and conventional dimension, while openness showed a negative correlation. This suggests that those who enjoy listening to this genre of music are cheerful, outgoing, reliable, and tend to be more conventional. Extraversion and agreeableness were positively associated with the energetic and rhythmic dimension, suggesting that these enthusiasts tend to be more talkative, full of energy, and forgiving.

Zweigenhaft (2008) extended this study using more detailed categories of the music preferences and personality (including six facets for each of the Five Factor traits, such as assertiveness and gregariousness for Extraversion), and obtained similar results. Arnett (1996) found that metalheads (fans of heavy metal music) score higher on scales of sensation-seeking than control groups, were more likely to be from divorced and/or dysfunctional families, and tended to be alienated from mainstream society. Thus, ordinary music preferences and their demographics have been meaningfully linked to personality and even lifestyle (i.e., metalheads).

Internet use, specifically online gaming, is just one of those ordinary, yet important areas of behavior in current society that Funder (2009) and Baumeister, Vohs, DeWall, & Zhang (2007) would argue deserve research attention. The findings noted above relating the Big Five personality traits to music preferences and personal environments suggest that “personality signatures” should be evident as well in the recreational pursuit of online game participation. If one’s personality comes through in
the appearance of their home or work space, and if it can predict what kinds of music one listens to or even one’s social identity (e.g., metalhead; “emo”), then shouldn’t it meaningfully relate to one’s preferences for online gaming and the kind of “gamer” one is?

**Psychological Aspects of Online Gaming**

For many, a primary motivator of online gaming is social outreach. “Online gaming is a social activity in which players meet new friends or play with friends they have already had outside the online world” (BBC News, 2003). Cole and Griffiths (2007) examined social interactions of MMORPG gamers and found that, in these virtual worlds, players could act in ways that they felt were more in accordance with “themselves”. These virtual games may provide a means for players to express themselves in ways they do not feel comfortable with in the real world. There are many potential factors that could prevent them from these desired expressions, such as age, gender, sexuality, and appearance. Bennett (2007) notes that “Virtual worlds provide additional and potentially therapeutic venues for people with physical and/or other disabilities for whom real-world contacts are accompanied by anxiety or stigma or are even physically impossible.” For various reasons, these gamers appear to be more introverted or shy. So, it seems likely that online gaming would appeal to less outgoing or extraverted individuals, allowing them to participate without fear of direct social evaluation. Online gaming, potentially, gives them the perfect opportunity to address this issue in themselves.
Another attractive aspect of online gaming to participants is anonymity. When gamers log on to one of these virtual worlds, they have little or no fear that their actions will face any real-life consequences, so they tend to act out much more than they would normally. They have the ability to carry out any actions online that they may want to perform in the actual world but do not, as it would be seen as socially incorrect. A study conducted by Suler (2004) dealt with this “online disinhibition effect”. One of Suler’s conclusions in this study was that the minimization of status and authority was a key concept in looking at the online disinhibition effect. “Authority figures express their status and power in their dress, body language, and in the trappings of their environmental settings. The absence of those cues in the text environments of cyberspace reduces the impact of their authority” (Suler, 2004). Due to this minimization of authority, gamers are much more likely to speak out or misbehave, something they may have wanted to do in actual life but did not want to deal with the consequences that come with these actions. These sorts of online expressions may be related to low levels of agreeableness. It is likely that those attracted to MMORPGs are aware of this virtual anonymity and the fact that they have the opportunity online to carry out actions that may be desirable to them, yet not to the rest of society. Competitive, argumentative tendencies (i.e., low agreeableness) normally held in check by the physical presence of other people may be given full reign online.

As stated in Chapter I, character creation is an essential aspect of MMORPGs. This exploration of character archetypes allows a player to creatively explore a side of themselves that they may feel uncomfortable about in their actual life. Park and Henley
(2007) found that, at the time of character creation, people choose characters that are a reflection of their own personality. Specifically, those higher in extraversion chose characters that were described as more charismatic. Also, agreeableness was positively correlated with preferences for characters with helping professions and negatively correlated with more deviant occupations. However, some gamers opt for a character that is completely opposite of themselves. Perhaps gamers higher in openness to experience may be more comfortable exploring different character identities online.

Bessiere, Seay, and Kiesler (2007) suggested that the anonymity and fantasy environment of MMORPGs allow individuals to be more like the person they wish they were, or their ideal self. Participants of this study rated their online personas as being more conscientious, extraverted, and less neurotic than themselves. This result was more pronounced in those who were depressed or showed lower levels of self-esteem, and less pronounced in those with higher levels of well-being.

Despite the fact that internet and online gaming addiction are not specifically covered in the DSM-IV-R (American Psychiatric Association, 1994), many current research studies focus on the addictive potential of such games and how they can drive people to lose control of their lives. A study conducted by Parsons (2006) found that approximately 15% of MMORPG enthusiasts meet the criteria for internet addiction. These criteria include incidences of depression, obsessive-compulsive disorder, and impulse control disorder. In an earlier study, Greenfield (1999) stated that 6% of internet users would be considered addicts, so the problem seems may be increasing. Young (1998) described internet addiction as “an impulse-control disorder which does not
involve an intoxicant”. Young refers to these addictions as process addictions. Process addictions involve a behavioral process, such as gambling and shopping, rather than a substance. Young notes that some experts would consider internet addiction to be the most addictive of the process addictions.

Throughout the media, there are many cases of people becoming addicted to this online phenomenon, reporting that these games are the primary causes of breaks in relationships as well as young adults dropping out of college due to excessive hours of playing. In my personal experience, I have a female friend who was engaged to an MMORPG player, who averaged 40 hours per week of online participation. Apparently, his case was fairly extreme, as she felt he spent more time logged in to the game than with her. Their relationship was ended when he was presented with the choice of her or the MMORPG. This problem can be seen much more dramatically in a few of the Asian countries. In South Korea, more than 15 million people are registered online gamers, which equates to 30% of their entire population. According to Farrand (2006), “online role playing has a strong appeal to Koreans who live in a tightly woven and hierarchical Confucian society”. Farrand (2006) goes on to say that private telephone emergency services have been created in South Korea after seven deaths in 2005. In China, rehabilitation clinics have been funded by the government to stop the “grave social problem” of teenage internet addiction (Cha, 2007). Thus it appears that neuroticism could be expected to predict high levels of online gaming use, with addictive gaming constituting a level of psychological disorder.
The personality domain of conscientiousness is also relevant to addictive MMORPG participation. When online gamers are spending the majority of their time immersed in these virtual worlds, they are most likely not spending time on things pertinent to their actual lives, such as school, work, and interpersonal relationships. With so many hours being played by these gamers, there have to be aspects of their actual lives that are being sacrificed.

However, the findings of more recent studies contradict earlier findings. A study conducted by Hussain and Griffiths (2009) found that MMORPG gamers were able to safely integrate online gaming into their everyday lives without hindering their performance at work and/or school. This implies that online gaming would be unrelated to conscientiousness. In fact, one might argue that MMORPG gamers would exhibit higher levels of conscientiousness, as they would need to balance their necessities (e.g., work and school) with their leisure activities (e.g., online gaming). Another study done by Williams, Yee, and Caplan (2008), using survey data with unobtrusive measures to answer their research questions, propose that a new theory of motivations behind MMORPG playing must be developed. They found that MMORPG gamers were physically healthier than, but mentally less healthy, than the general population. Surprisingly, the most active group of MMORPG players was older females. Achievement, immersion, and sociability seemed to be the strongest contributing factors of MMORPG gaming.

Peters & Malesky (2008) examined problematic usage among highly-engaged MMORPG players, specifically players of *World of Warcraft*. They found that time
spent playing *World of Warcraft* was positively correlated with the likelihood of experiencing problems in their lives. However, they described this relationship as only moderate and explained that results cannot imply that all highly-engaged players will experience numerous or severe real-life problems. In the same study, Peters & Malesky also suggested that one reason gamers spend more time playing is to avoid face-to-face contact, in which they may not possess adequate social skills. However, they also described this relationship as weak, positing that these individuals desire some amount of social contact.

Cole & Griffiths (2007) studied social interactions and demographic data for MMORPG players. They found that the average age of MMORPG players was 23.6 years, with female gamers being significantly older than male gamers. The average number of hours played per week was 22.85, with males playing significantly more than females. Roughly three quarters of males and females reported that they had made a good friend within the game, with males reporting a significantly higher number of friends made while online. Significantly more females reported being attracted to another online player, with almost one-third of the entire participant pool reporting that they had been attracted to another player on at least one occasion. Significant relationships were also found between the type of player and their motivation for playing. Those interested in playing roles were motivated by enjoying a different lifestyle in a virtual environment. Those interested in having adventures and merely playing games were more motivated by curiosity, astonishment, reasoning, creativity, and problem-solving than other types of gamers.
Personality and General Online (Internet) Use

Many studies have shown that extensive internet use is associated with feelings of loneliness and depression, as well as impulsivity and social comfort while online (Taylor, 2003). Social discomfort is a factor associated with shyness, and therefore, introversion (Davis, 2002). When looking at relationships formed by shy, or introverted, individuals, Ward (2004) found that shy people have an easier time with online communication than with face-to-face communication. A study conducted by Ebeling-Witte et al. (2007) examined personality, shyness, and online usage. They found that shyness was significantly correlated with an online conversational preference (rather than face-to-face), neuroticism, and low extraversion. A backward regression analysis showed that problematic online usage was significantly predicted by shyness and familiarity with computers and the internet. These results suggest that the Internet gives those who are shy a venue to communicate with the outside world, even though they may also be viewed as having problematic Internet usage by some psychological scales (Ebeling-Witte, 2007).

Other studies have used Eysenck’s three personality dimensions to assess individual differences: extraversion, neuroticism, and psychoticism (Eysenck & Eysenck, 1991). Extraversion and neuroticism in Eysenck’s model are similar to those traits in the Five Factor Model. Psychoticism involves attributes such as being solitary, insensitive to others, aggressive, and disregarding social norms (Eysenck & Eysenck, 1991). People who are high in psychoticism have tendencies to behave in antisocial manners. This may have negative consequences to their social lives, due to alienation of
their social acquaintances (Powell & Stuart, 1983). Hamburger and Ben-Artzi (2000) found that, for women, internet use and extroversion were negatively associated, while neuroticism was positively related with the use of social services on the Internet. Amiel and Sargent (2004) likewise found that, for either gender, neuroticism was positively related to social uses of the Internet, while extroversion was again found to be negatively associated. They also concluded that “people high on psychoticism have an interest in sophisticated and deviant use of Internet, but not in social-communal use” (Amiel & Sargent, 2004, p. 719).

A person’s behavior reflects their personality tendencies as well as situational constraints. It is likely that the anonymity offered by the Internet may give some individuals an outlet to express otherwise constrained aspects of themselves. When one’s behavior goes against societal norms, they are much more likely to express their true selves online, rather than face-to-face. Amichai-Hamburger et al. (2002) examined the relationship between expressing one’s “true self” on the Internet and Eysenck’s personality dimensions. They concluded that the “real me” on the Internet was negatively correlated with extroversion and positively correlated with neuroticism. Tosun & Lajunen (2010) took this work a step further, creating a distinction between Internet use as a social extension (maintaining real-life relationships while online) and Internet use as a social substitute (preferring online to face-to-face interactions). They found that extraversion was only associated with Internet use as a social extension, and not with Internet use as a social substitute.
A study conducted by Chen et al. (2008) looked at the personality traits and life satisfaction of online game players. Using a regression analysis, the researchers found three significant predictors of life satisfaction: openness, neuroticism, and conscientiousness. Openness to new experiences and conscientiousness positively influenced life satisfaction, with openness being the strongest of the predictors. Meanwhile, neuroticism negatively influenced gamers’ life satisfaction. The lower they scored on the dimension of neuroticism, the higher their life satisfaction.

Van der Aa, Overbeek, Engles, Scholte, Meerkerk, and Van den Eijnden (2009) examined the links between adolescents’ daily Internet use and negative well-being, characterized by low self-esteem, loneliness, and depressed moods. They found that daily Internet use by itself is only weakly, and indirectly associated with negative well-being in adolescents. They concluded that it is most likely other factors that are responsible for problematic Internet usage, such as compulsive Internet use, not being able to stop using the Internet, and their Internet use interfering with other responsibilities or social contacts. These same findings applied to both boys and girls in their study.

Valkenburg and Peter (2009), however, propose a different outlook on the consequences of Internet use for social connectedness and well-being. There has been a shift from negative to positive effects of Internet use, due to its ease of accessibility. In the earlier days of Internet use, individuals primarily communicated with strangers. This, however, is not the case in the current era. Current technology, such as Instant Messaging, promotes communication with real-life friends, rather than online strangers.
This type of communication also promotes online self-disclosure which is directly related to social connectedness and well-being.

**Fantasy Proneness**

Much internet gaming (e.g., *World of Warcraft*) involves fantasy and imagination. The ability of a person to imagine or role play in a virtual fantasy world is likely related to enjoyment or engagement of the online gaming experience, and it may promote increased participation. If it is easy to “mentally get into the game” with one’s imagination, this is probably more reinforcing than if one has to work hard at the role playing involved. The concept of fantasy proneness has been studied a fair amount in psychology, though not necessarily in relation to leisure pursuits such as online gaming.

Wilson and Barber (1983) were the first to introduce the concept of fantasy proneness. They describe fantasy-prone individuals as spending time fantasizing, reporting paranormal experiences (e.g., telepathy, precognition, etc.), and having vivid childhood memories, fantasies so “real” that they come close to hallucinations, and intense religious experiences. Lynn & Rhue (1988) concluded that fantasizers exhibit higher levels of psychopathology than controls, suggesting that fantasizers have a difficult time coping with reality and, thus, escape into a fantasy world of their own design. Research has identified many traits associated with fantasy proneness: absorption (Merckelbach, et al., 2000), dissociativity (Merckelbach, et al., 1999), and schizotypy (Kilhstrom, et al., 1994). Hyman & Billings (1998) found that fantasizers have a positive response bias that seems to enhance their vulnerability to memory distortions. Myers (1983) found that girls were more likely to fantasize than boys.
Research to date has not shown that fantasy proneness in an individual is necessarily adaptive (as a coping mechanism) versus maladaptive (having difficulty in coping with real-life).

Sanchez-Bernardos & Avia (Sanchez-Bernardos & Avia, 2003), using the Creative Experiences Questionnaire (CEQ; Merckelbach, Horselenberg, & Muris, 2001), examined how fantasy proneness related to the five domains of personality in a group of adolescents. The CEQ was specifically designed to measure fantasy proneness as conceptualized by Wilson and Barber (1983) (see above), although without a specifically pathological emphasis. Similar to Myers (1983), Sanchez-Bernardos & Avia (2003) found that girls fantasized more than boys. Though the researchers had hypothesized that fantasy proneness would be primarily associated with openness, it was instead most strongly correlated with neuroticism. Fantasy prone individuals presented themselves as emotionally unstable, agreeable, not very conscientious, and more open to experiences than those who are less prone to fantasy. Sanchez-Bernardos & Avia (2003) concluded that fantasy proneness should be viewed as a maladaptive, rather than a beneficial aspect of one’s personality.

Rivers (2007) examined aspects of absorption and fantasy proneness in fantasy role-players. Significant correlations between empathy and absorption and empathy and fantasy proneness supported the researcher’s hypothesis that fantasy role-players would exhibit higher levels of fantasy proneness, imagination, and empathy.
Hypotheses

The general research question of this study is “what are the personality differences between MMORPG gamers and non-gamers?” *Hypothesis 1 (H1): MMORPG gamers will show higher levels of openness to experience compared to non-gamers.* Freddolino (2007) noted that gamers willingly enter a virtual world in which they will be given ample amounts of game play while being confronted with copious amounts of online strangers. *H2: MMORPG gamers will exhibit higher levels of conscientiousness than non-gamers.* Due to the finding of Hussain and Griffiths (2009), and given the participant sample to be used, it is expected that MMORPG gamers will exhibit higher levels of conscientiousness than their non-gamer counterparts. *H3: MMORPG gamers will exhibit higher levels of extraversion than non-gamers.* Prior research is somewhat split on whether not these gamers should be more or less extraverted than non-gamers. I tend to follow the mindset that an MMORPG player subscribes to this genre of gaming because they want to exhibit through their avatar what they feel is more self-representative (e.g., Park & Henley, 2007), rather than simply because they are more shy, or introverted. Thus, gamers should be more extraverted than non-gamers. *H4: MMORPG gamers will exhibit higher levels of fantasy proneness than non-gamers.* MMORPGs provide a fantasy environment similar to other (e.g., not online) role-playing games. Due to the findings of Rivers (2007), it is expected that MMORPG gamers will show elevated levels of fantasy proneness, as their fantasy role-playing counterparts. *H5: MMORPG gamers will exhibit higher levels of neuroticism than non-gamers.* A gamer of this genre is immersing themselves in a world of fantasy.
Given the maladaptive nature of fantasy proneness, and its correlation with neuroticism, it is predicted that MMORPG gamers will exhibit higher levels of neuroticism, as well as fantasy proneness than non-gamers. *H6: There will be no significant differences between MMORPG gamers and non-gamers in agreeableness.* Prior research is equivocal regarding online activities and agreeableness. Therefore, I do not expect to find significant differences between the two groups. However, I expect there to be significant differences among gamers with differing MMORPG game play styles. *H7: “Raiders” will show higher levels of agreeableness than those with varying game play approaches.* The cooperative nature of raiding dictates that a player must interact with multiple other online users to reach goals unattainable by themselves. If a gamer was deemed uncooperative by other raiders, they would not be invited to participate in these groups. *H8: “Raiders” will exhibit higher levels of extraversion than those with varying game play approaches.* Raiding requires constant interaction with other players, not only via text-based conversations, but often by in-game voice chatting. These “raiders” will exhibit higher levels of extraversion than others, due to the requirement of cooperative play during raiding.
CHAPTER III

METHODOLOGY

Participants

The participant sample of 253 respondents was 32.4% male and 67.6% female. The majority of the participants identified their ethnicity as Caucasian (74.3%), while the rest of the participant population were as follows: 16.2% Hispanic, 4.7% Asian, 3.2% African-American, and 1.6% as “other”. Their ages ranged from 18 to 61 years ($M = 24.48; SD = 7.80$). Eighty percent of the participants identified their marital status as single, 10% as married, 4% as divorced, and 6% as “other”. When asked about their level of education, 1.6% of the participants identified themselves as having a postgraduate (Master’s or PhD) degree, 22.3% possessing a college degree (Bachelor’s degree), 70.5% have attended some college (not possessing a Bachelor’s degree), 5.2% have a high school diploma or GED, and .4% did not complete high school. The range of hours per week attending school by the participant sample was 0 to 47 ($M = 14.88, SD = 7.64$). When asked how many hours they work, the participants gave a range of 0 to 60 hours per week ($M = 12.72, SD = 13.56$). Hours per week using the internet ranged from 0 to 147, with a mean of 21.39 hours ($SD = 15.90$).

Materials

An internet use and gaming use self-report survey was developed for this study and is shown in Appendix A. In addition to gathering general demographic data
(gender, ethnicity, etc.), the survey assesses how much time a person typically spends online (e.g., hours in a typical day; hours in a typical week; days in a typical week) and what activities they generally participate in while online. Some examples of this are “In a typical week, how many hours do you spend online?” and “How often do you shop online?” This survey also assessed how often a participant engages in playing MMORPGs and what aspects of MMORPGs they most prefer. Some examples of this are “In a typical week, how many hours do you spend playing MMORPGs?” and “How many real-life friends play MMORPGs with you?”

To measure the Five-factor model of personality traits, the NEO-FFI (Costa & McCrae, 1992) was used. The NEO-FFI is a 60-item personality test using a 5-point agreement scale, measuring each of the five factors: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Examples of items measuring the various factors are: Openness - “I often enjoy playing with theories or abstract ideas”; Conscientiousness - “I waste a lot of time before settling down to work”; Extraversion - “I really enjoy talking to people”; Agreeableness - “I would rather cooperate with others than compete with them”; Neuroticism - “I often feel tense and jittery”. The NEO-FFI has been used and validated in numerous studies and has been agreed upon by numerous personality researchers to be an accurate measure of the 5-factor model. Internal consistency for the five domains of the NEO-FFI were calculated using coefficient alphas, which ranged from .68 to .86. The NEO-FFI scales correlate well with the full 48-item domain scales of the NEO-PI-R, ranging from .88 to .94.
To measure fantasy proneness, the Creative Experiences Questionnaire, or CEQ (Merckelbach, 2001) was used. The CEQ consists of 25 yes/no items. Items measure various aspects of fantasy proneness, from developmental antecedents to involvement in fantasy and daydreaming to the consequences of fantasizing. Some examples of items in the CEQ are “When I think of something cold, I actually get cold” and “As a child, I had my own make believe friend or animal”. Reliability for the CEQ was assessed and found to be good: test-retest reliability of .95 and internal consistency reliability (Cronbach’s alpha) of .72.

As with any self-report measures, there is an ever present potential for responding in a manner that is socially desirable, rather than entirely truthful. To compensate for this potentiality, the Balanced Inventory of Desirable Responding, or BIDR (Paulhus, 1988), was used. The BIDR is a 40-item measure, in which items are stated as propositions. Participants then rate their agreement of each item, based on a 7-point scale. Items measure two distinct aspects: Self-Deception (SDE) and Impression Management (IM). These scores may then be summed to attain an overall measure of socially desirable responding (SDR). A sample of an item measuring SDE is “I always know why I like things”. A sample of an item measuring IM is “When I hear people talking privately, I avoid listening”. Reliability of the BIDR has been assessed in numerous studies. When measuring internal consistency, these studies yielded coefficient alphas ranging from .68 to .80 for SDE and .75 to .86 for IM. When summed together for SDR, the alpha is .83 (Paulhus, 1988). Paulhus (1988) also reported test-retest reliability correlations of .69 for SDE and .65 for IM. When assessing the
concurrent validity of the BIDR, Paulhus (1988) found that SDE correlates positively with many traditional measures of defense and coping, such as Ihilevich and Gleser’s Defense Mechanism Inventory (1986) and the Ways of Coping Scale (Folkman, 1986). Paulhus (1988) notes that the IM scale correlates highly with many measures that are traditionally known as lie scales, such as Eysenck’s Lie scale and the MMPI Lie scale.

Procedure

Data were collected by self-report questionnaires (listed in the previous section), using the commercial internet site QuestionPro.com. In this study, participants were acquired via the use of three recruiting channels. A departmental e-mail was sent to all students at California State University, Chico who had declared that they were either a Psychology major or minor. This e-mail gave a brief overview of the study and the web address of the online survey. Second, a bulletin was posted in the Psychology department, referring any willing participants to the website. Third, a flyer was posted in the employee lounge of a commercial retail electronics store (Best Buy, Chico) that gave the same information as the previously mentioned bulletin.

Upon logging onto the website of the survey, all participants first read and electronically signed an informed consent page. Failure to complete this electronic signature blocked their access to the survey. After agreeing to the terms of the informed consent page, participants were granted access to the survey. The internet use and gaming use inventory were completed first. After this, participants were presented with the NEO-FFI, then the CEQ, then the BIDR. At the end of all of the self-report questionnaires, a debriefing page was presented, detailing the purpose of the present
study. Also, information to contact the researcher by e-mail was given, in case there were any questions or concerns regarding the study.
CHAPTER IV

RESULTS

Missing Data

Upon examination of the data set, there were a few questions in the surveys that participants had left unanswered. To avoid entirely omitting the responses from certain participants, due to one or two missing cells of data, this problem was corrected. Regarding the NEO-FFI, there were a total of ten questions left unanswered, out of a possible 15,180. Since the items on the NEO-FFI consisted of answering on a 5-point agreement scale, the unanswered items were filled in with a value of three, as to not affect the results of any analyses. Regarding the BIDR, there were a total of thirteen questions left unanswered, out of a possible 10,120. Similarly to the NEO-FFI, the items on the BIDR were also answered on an agreement scale. However, instead of a 5-point agreement scale, these items were comprised of a 7-point agreement scale. Therefore, these unanswered items were filled in with a four, rather than a three.

Creating New Variables

A new measure of non-MMORPG internet activities was created by reverse coding and calculating the mean scores of the variables measuring how often chat rooms are used (1 to 6 scale), how often instant messengers are used (1 to 6 scale), how often social networking sites are used (1 to 6 scale), how often a person blogs (1 to 6 scale),
how often non-MMORPG video games are played (1 to 6 scale), how often a person
web-browses (1 to 6 scale), how often a person listens to online music (1 to 6 scale), how
often a person file-shares (1 to 6 scale), how often a person shops online (1 to 6 scale),
how often a person reads news online (1 to 6 scale), and how often internet TV is used (1
to 6 scale) into a single composite measure. This new measure had a potential range of 1
to 6, and responses for it actually ranged from 1.45 to 5.0 ($M = 3.18$, $SD = .64$, $n = 251$).

A new variable was created determining whether or not a person was an
MMORPG player. This was created by categorizing the responses given to the question,
“How many days in a typical week do you play Massively Multiplayer Online Role-
Playing Games?” If a participant’s response was “Never” on this 6-point Liekert scale,
they were categorized as a non-MMORPG player. If a participant’s response was any of
the other five options (“Less than once a month” to “Every Day”), they were categorized
as an MMORPG player. These newly created variables, as well as other descriptive
statistics from the Internet use and gaming use self-report survey, NEO-FFI, CEQ, and
BIDR can be seen in Table 1.

Group Comparisons Between MMORPG
Gamers and Non-Gamers

To determine whether gamers and non-gamers differed in overall internet use
(i.e., general and nongaming internet use), MANOVA compared these two groups across
four dependent variables measuring internet and non-MMORPG use: days per week
using the internet, hours per day using the internet, hours per week using the internet, and
non-MMORPG internet activities. The multivariate effect was not significant, despite
Table 1

Descriptive Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days per week using the Internet</td>
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<td>2.0</td>
<td>15.0</td>
<td>6.48</td>
<td>.94</td>
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<tr>
<td>Hours per day using the Internet</td>
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<td>.30</td>
<td>24.0</td>
<td>3.17</td>
<td>2.62</td>
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<td>Hours per week using the Internet</td>
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<td>.00</td>
<td>147.0</td>
<td>21.39</td>
<td>15.90</td>
</tr>
<tr>
<td>Non-MMORPG Internet activities</td>
<td>251</td>
<td>1.45</td>
<td>5.00</td>
<td>3.18</td>
<td>.64</td>
</tr>
<tr>
<td>Days per week playing MMORPGs</td>
<td>253</td>
<td>.00</td>
<td>7.00</td>
<td>1.04</td>
<td>2.01</td>
</tr>
<tr>
<td>Hours per day playing MMORPGs</td>
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<td>.00</td>
<td>13.00</td>
<td>.90</td>
<td>1.75</td>
</tr>
<tr>
<td>Hours per week playing MMORPGs</td>
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<td>.00</td>
<td>50.00</td>
<td>3.81</td>
<td>8.00</td>
</tr>
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<td>Real-life MMORPG friends</td>
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<td>.00</td>
<td>20.00</td>
<td>1.30</td>
<td>2.91</td>
</tr>
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<td>Neuroticism</td>
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<td>15.00</td>
<td>60.00</td>
<td>34.14</td>
<td>8.18</td>
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<td>Extraversion</td>
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<td>25.00</td>
<td>59.00</td>
<td>41.42</td>
<td>6.05</td>
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<tr>
<td>Openness to new experiences</td>
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<td>57.00</td>
<td>41.90</td>
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<td>Agreeableness</td>
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<td>59.00</td>
<td>43.57</td>
<td>6.14</td>
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<td>Conscientiousness</td>
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<td>25.00</td>
<td>60.00</td>
<td>44.04</td>
<td>6.65</td>
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<tr>
<td>CEQ score</td>
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<td>30.00</td>
<td>50.00</td>
<td>41.27</td>
<td>4.34</td>
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<tr>
<td>Self-deception</td>
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<td>54.00</td>
<td>124.00</td>
<td>84.13</td>
<td>11.97</td>
</tr>
<tr>
<td>Impression management</td>
<td>253</td>
<td>52.00</td>
<td>103.00</td>
<td>77.54</td>
<td>9.96</td>
</tr>
</tbody>
</table>
approaching significance: Wilks Lambda = .969, $F (4, 246) = 1.98, p = .099$. Because the multivariate effect was not significant, significant univariate effects must be interpreted with caution. There was one significant univariate effect found for non-MMORPG internet activities, $F (1, 249) = 6.87, p = .009$, indicating slightly more non-MMORPG activities for gamers ($M = 3.36$) than for non-gamers ($M = 3.12$). There were no other differences between gamers and non-gamers on internet use variables.

To determine whether gamers and non-gamers differed on personality variables, a MANOVA was used to compare these two groups across eight dependent variables. These variables were openness, conscientiousness, extraversion, agreeableness, neuroticism, fantasy proneness, self-deception and impression management. This analysis indicated no significant multivariate effect between MMORPG gamers and non-gamers. However, a univariate effect for extraversion approached significance, $F (1, 251) = 3.47, p = .064$. This must be interpreted cautiously, since the overall multivariate effect was not significant.

**Predicting Extent of MMORPG Participation Among Gamers**

A stepwise multiple regression analysis was used to predict how many hours per day an MMORPG player engages in online gaming from eight predictor variables: openness, conscientiousness, extraversion, agreeableness, neuroticism, fantasy proneness, self-deception, and impression management. The final model had one predictor and a significant multiple correlation of $R = .351, F (1, 63) = 8.86, p = .004$. This predictor was openness ($\beta = -.351, p = .004$), which accounted for 12.3% of the variance in MMORPG hours per day.
Another stepwise multiple regression analysis was used to predict how many real-life friends that MMORPG players reported playing with them from the same eight predictor variables as stated earlier: openness, conscientiousness, extraversion, agreeableness, neuroticism, fantasy proneness, self-deception, and impression management. The final model had one predictor and a significant multiple correlation of $R = .253$, $F (1, 63) = 4.32, p = .042$. This predictor was self-deception ($\beta = .255, p = .042$), which accounted for 6.4% of the variance in the dependent variable.

A multivariate analysis of variance (MANOVA) was conducted using aspects of MMORPG game play (raiding, PVP, leveling) to examine the same eight dependent variables as in the first MANOVA. This analysis indicated no significant multivariate effect between the three aspects of MMORPG gaming. However, there was a significant univariate effect for extraversion, $F (2, 57) = 6.21, p = .004$. Post-hoc Tukey comparisons indicated that players identifying raiding as their favorite aspect of MMORPGs ($M = 42.92$) scored significantly higher on extraversion than players who identified their favorite aspects of MMORPGs as either PVP ($M = 38.88$) or leveling ($M = 37.72$).

Bivariate correlations were computed between the following 16 variables: days in a typical week using the internet, hours per day of internet use, hours per week of internet use, non-MMORPG internet activities, days per week playing MMORPGs, hours per day playing MMORPGs, hours per week playing MMORPGs, real-life friends who also play MMORPGs, openness, conscientiousness, extraversion, agreeableness, neuroticism, fantasy proneness, self-deception, and impression management. Using a
two-tailed test and a .05 alpha level, there were many correlations that obtained statistical significance, shown in Tables 2 and 3. Hours per week playing MMORPGs was positively correlated with real-life friends who also play MMORPGs, \( r(63) = .266, p = .032 \). Neuroticism was significantly negatively associated with self-deception, \( r(63) = - .495, p < .001 \), indicating that those who are more neurotic have a tendency to show lower levels of self deception. Openness was negatively correlated with hours per day playing MMORPGs, \( r(63) = -.351, p = .004 \), indicated that people who are more open to new experiences will play fewer hours per day of MMORPGs. Openness, however, was also positively correlated with fantasy proneness, \( r(63) = .311, p = .012 \). Self-deception was positively correlated real-life friends who also play MMORPGs, \( r(63) = .253, p = .042 \). Those who indicated playing MMORPGs with real-life friends also held higher levels of self-deception. There were many other bivariate correlations that attained statistical significance. However, they were not as notable for the purposes of this study. These results can be seen in Tables 2 and 3.

Table 2

Correlations of Internet and MMORPG Variables

<table>
<thead>
<tr>
<th>Internet Use</th>
<th>Days</th>
<th>Hours</th>
<th>Week</th>
<th>Friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days per week</td>
<td>.03</td>
<td>.01</td>
<td>.05</td>
<td>.08</td>
</tr>
<tr>
<td>Hours per day</td>
<td>.14*</td>
<td>.13*</td>
<td>.19**</td>
<td>.16**</td>
</tr>
<tr>
<td>Hours per week</td>
<td>.14*</td>
<td>.20**</td>
<td>.19**</td>
<td>.32**</td>
</tr>
<tr>
<td>Non-MMORPG</td>
<td>.15*</td>
<td>.19**</td>
<td>.19**</td>
<td>.29**</td>
</tr>
</tbody>
</table>

*Note.* Days = Days per week playing MMORPG; Hours = Hours per day playing MMORPG; Week = Hours per week playing MMORPG; Friends = Real-life friends playing MMORPG. *\( p < .05 \); **\( p < .01 \).
Table 3

*Correlations of Personality Variables and Internet Use*

<table>
<thead>
<tr>
<th>Personality Variable</th>
<th>Days</th>
<th>Hours</th>
<th>Week</th>
<th>Non</th>
<th>MD</th>
<th>MH</th>
<th>MW</th>
<th>RM</th>
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<tr>
<td>Neuroticism</td>
<td>.08</td>
<td>.07</td>
<td>.09</td>
<td>.07</td>
<td>-.02</td>
<td>-.03</td>
<td>-.05</td>
<td>-.07</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.05</td>
<td>-.01</td>
<td>-.07</td>
<td>.02</td>
<td>-.09</td>
<td>-.08</td>
<td>-.08</td>
<td>-.07</td>
</tr>
<tr>
<td>Openness</td>
<td>-.07</td>
<td>.07</td>
<td>.12</td>
<td>.21**</td>
<td>-.10</td>
<td>-.08</td>
<td>-.12</td>
<td>.06</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.07</td>
<td>-.29**</td>
<td>-.31**</td>
<td>-.14*</td>
<td>-.05</td>
<td>-.09</td>
<td>-.11</td>
<td>-.14*</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.04</td>
<td>-.08</td>
<td>-.02</td>
<td>-.02</td>
<td>-.04</td>
<td>.02</td>
<td>.03</td>
<td>.06</td>
</tr>
<tr>
<td>CEQ Score</td>
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<td>-.08</td>
<td>-.04</td>
<td>.05</td>
<td>.02</td>
<td>.04</td>
<td>.01</td>
</tr>
<tr>
<td>Self-Deception</td>
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<td>-.07</td>
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<td>-.05</td>
<td>-.01</td>
<td>.01</td>
<td>.04</td>
<td>.09</td>
</tr>
<tr>
<td>Impression Man.</td>
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<td>-.09</td>
<td>-.07</td>
<td>-.13*</td>
<td>.02</td>
<td>.03</td>
<td>.01</td>
<td>-.06</td>
</tr>
</tbody>
</table>

*Note.* Days = Days per week using the Internet; Hours = Hours per day using the Internet; Week = Hours per week using the Internet; Non = Non-MMORPG Internet activities; MD = Days per week playing MMORPG; MH = Hours per day playing MMORPG; MW = Hour per week playing MMORPG; RM = Real-life MMORPG friends. *p < .05; **p < .01.
H1: MMORPG Gamers Will Show Higher Levels of Openness to Experiences Than Non-Gamers

This hypothesis was not supported, as there was no significant difference in openness between MMORPG gamers and non-gamers. The MANOVA comparing gamers to non-gamers across eight dependent variables (five NEO scales, CEQ fantasy-proneness, two BIDR social desirability scales) showed no significant multivariate effect in general, and no significant univariate effect for openness.

Interestingly, among MMORPG gamers, a bivariate correlation analysis showed that openness was negatively associated with hours per day playing MMORPGs. This was actually contrary to this hypothesis. Also, the regression analysis (using only MMORPG gamers) predicting hours per day of MMORPG use from eight predictor variables (five NEO scales, CEQ fantasy-proneness, two BIDR social desirability scales) found that openness was the only significant predictor. I was under the presumption that MMORPG gamers flock to this genre of gaming to experience a new world, where creativity is generally rewarded. However, these results could rather show that MMORPG gamers hold some sort of predisposition to the fantasy genre. Perhaps, in a society filled with exposure to fantasy, such as *The Lord of the Rings* and other fantasy books and movies, online gaming is not venturing into a new experience, but rather,
continuing with a theme to which they are already accustomed.

**H2:** MMORPG Gamers Will Exhibit Higher Levels of Conscientiousness Than Non-Gamers

This hypothesis was not supported, as there was no significant difference in conscientiousness between MMORPG gamers and non-gamers. The MANOVA comparing gamers to non-gamers across eight dependent variables showed no significant multivariate effect in general, and no significant univariate effect for conscientiousness.

This lack of significant results could be due, in part, to the convenience sample used in the study. The majority of participants were students at California State University, Chico. It can be assumed that, to succeed in an educational environment, one must possess the skills needed to balance their social life with their studying and other life necessities, which would overlap into online gaming. In other words, college students as a group may be more conscientious than the general population. Table 1 shows that the mean conscientiousness score for the sample was 44.0 with a standard deviation of 6.65. This is about 1.7 standard deviations above the adult norms (Costa and McCrae, 1992) for NEO-FFI conscientiousness for men ($M = 32.91, SD = 6.15$) and women ($M = 33.55, SD = 6.53$).

**H3:** MMORPG Gamers Will Exhibit Higher Levels of Extraversion Than Non-Gamers

This hypothesis was not supported, as there was no significant difference in extraversion between MMORPG gamers and non-gamers. The MANOVA comparing
gamers to non-gamers across eight dependent variables showed no significant multivariate effect in general, and no significant univariate effect for conscientiousness.

There are currently two houses of thought that surround the concept of extraversion and online gaming. One point of view (Ebeling-Witte et al. 2007) is that an individual will use the Internet as a sort of escape from real-life, or that they would rather have fewer face-to-face relationships. The other point of view (Cole & Griffiths, 2007), the one from which I based this hypothesis, is that an individual uses online anonymity as an outlet to convey to others who they truly are, in a realm in which they are free from direct social evaluation. It seems likely that both of these views could be correct. While one is true for a given person, the other could also be true for an entirely different individual. This would make sense, as there were no significant univariate effects in either direction. This could also imply that there is some other, currently unidentified predictor variable involved.

H4: MMORPG Gamers Will Exhibit Higher Levels of Fantasy Proneness Than Non-Gamers

This hypothesis was not supported, as there was no significant difference in fantasy proneness between MMORPG gamers and non-gamers. The MANOVA comparing gamers to non-gamers across eight dependent variables showed no significant multivariate effect in general, and no significant univariate effect for fantasy proneness.

It was assumed that, due to the fantasy environment of MMORPGs, gamers would be more prone to fantasy than non-gamers. These results, however, could mean that gamers do not necessarily become more engrossed in this genre of gaming, or other
fantasy-based environment, than any other person. Perhaps, MMORPG gamers have actually become desensitized to the fantasy aspect of the genre, as it has become more commonplace to them.

**H5: MMORPG Gamers Will Exhibit Higher Levels of Neuroticism Than Non-Gamers**

This hypothesis was not supported, as there was no significant difference in neuroticism between MMORPG gamers and non-gamers. The MANOVA comparing gamers to non-gamers across eight dependent variables showed no significant multivariate effect in general, and no significant univariate effect for neuroticism.

Given that neuroticism is correlated with fantasy proneness, and that there was no difference found in fantasy proneness between MMORPG gamers and non-gamers, it makes sense that there is also no difference between them in neuroticism.

**H6: There Will Be No Differences Between MMORPG Gamers and Non-Gamers in Agreeableness**

This hypothesis was supported. No univariate effect was found between gamers and non-gamers. Also, there were no significant correlations found regarding agreeableness and any of the MMORPG gaming variables. This makes sense, as I found nothing in the literature that would dictate any differences in agreeableness between MMORPG gamers and non-gamers.
H7: “Raiders” Will Show Higher Levels of Agreeableness Than Those With Varying Game Play Approaches

This hypothesis was not supported, as there was no significant difference in agreeableness between the three aspects of MMORPG game play (raiding, PVP, leveling). The MANOVA comparing these aspects of game play across eight dependent variables (five NEO scales, CEQ fantasy-proneness, two BIDR social desirability scales) showed no significant multivariate effect in general, and no significant univariate effect for agreeableness.

This finding, that raiders are no more agreeable than other types of MMORPG gamers, could be due to the fact that an in-game raid brings many various people and personalities together. While some may actively attempt to get along with each other, others may not. They may disagree with the actions of others or be frustrated by those with a lower level of skill than their own. Perhaps they see raiding as more of a means to an end, with the end being the end-game content of a given game or the possibility of the best in-game rewards. Also, it is likely that significant results were not found in this analysis because of the groups’ small sample sizes (Raiding = 26, PVP = 16, Leveling = 16).

H8: “Raiders” Will Exhibit Higher Levels of Extraversion Than Those With Varying Game Play Approaches

This hypothesis was supported. While the MANOVA comparing aspects of MMORPG game play across eight dependent variables showed no significant multivariate effect in general, a significant univariate effect for extraversion was found.
The levels of extraversion reported by raiders was significantly higher than those of other gaming styles. When a gamer is actively raiding, they are continuously interacting with other real-life individuals. The in-game goals of raiding require this level of group participation. Gamers who do not possess these same levels of extraversion would, understandably, not have the desire to raid. Rather, they would be more likely to look to facets of the game in which they can play on their own, without the requirements of such group participation.

Additional Findings

An unexpected, but interesting finding emerged from the results of this study. There was a significant bivariate correlation between reported number of real-life friends who also play MMORPGs and self-deception. Also, self-deception was identified as the only significant predictor of real-life friends who also play MMORPGs. This potentially means that these online gamers are creating a justification for themselves as to why they participate in this online activity, that their actual friends do it too. However, given the relationship to self-deception, this may not be a factual occurrence. It may be the case that this is little more than a reason, albeit false, that is given to explain a potentially extreme behavior.

Limitations

It was more difficult than I had expected to tap into a larger population of people who actively play MMORPGs. My intended methodology was to administer these surveys to customers of consumer electronics stores. However, I was not allowed by these various stores to collect data at their establishments, as it was felt that my
questionnaires would inconvenience the customers. This meant that I was left with the
standard convenience sample that is often examined in this kind of research. Out of the
total pool of participants \( n = 253 \), only 65 identified themselves as MMORPG players.
Many of the analyses that were done focused on this rather small sub-sample, limiting the
statistical power of the results. Also, the results found by this study are not very
generalizable to differing populations. The sample used in this study was fairly
homogenous, with the majority of participants identifying themselves as Caucasian
\((74.3\%)\), fairly young \((M = 24.48)\), and still pursuing educational goals \((70.5\%\) having
had some college, but not yet attaining a Bachelor’s degree).

**Further Research**

To gain further understanding of differences between MMORPG gamers and
non-gamers, a different way of gathering participants is recommended. Rather than
relying on convenience samples, future investigation warrants attempting to reach more
highly condensed groups of MMORPG gamers, such as consumer electronics stores in
which this genre of gaming is sold. Also, a great amount of insight could be gained if a
researcher was allowed in-game access by the companies producing these games.
Utilizing this method would allow data collection in the very heart of the genre, while
gamers are actively participating in a given game.

Also, the unexpected findings regarding self-deception and real-life friends
who also play MMORPGs warrant further research. There may be health risks regarding
those who are providing false justifications for activities in which they participate.
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APPENDIX A
Internet Use and Gaming Use Self-Report Survey

Sex: _____________    Marital Status: ______________
Age: _____________    Ethnicity: __________________

How many days in a typical week do you use the internet? _____________

When using the internet, how many hours do you usually use it? _________

How many total hours do you usually use the internet each week? ________

How often do you use chat rooms? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you use Instant Messenger? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you use social networking sites? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you blog? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you play console-based (PS3, Xbox 360, etc.) or computer-based video
games (non-MMORPG)? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you web-browse? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month

How often do you listen to online music? (Circle the option that best describes you)
Every day     More than     Once a     Once a     Less than     Never
              once a week    week     month     once a month
How often do you file share? (Circle the option that best describes you)

Every day  More than  Once a  Once a  Less than  Never
   once a week  week  month  once a month

How often do you shop online? (Circle the option that best describes you)

Every day  More than  Once a  Once a  Less than  Never
   once a week  week  month  once a month

How often do you read news online? (Circle the option that best describes you)

Every day  More than  Once a  Once a  Less than  Never
   once a week  week  month  once a month

How often do you use internet TV? (Circle the option that best describes you)

Every day  More than  Once a  Once a  Less than  Never
   once a week  week  month  once a month

Where do you use the internet most? (Circle the option that best describes you)

Home  School  Café  Library  Mobile phone
Friends or Family’s house  Other (specify)________________

How many online contacts do you currently have that you have not met face-to-face? 

________

Do you use a webcam? (Circle one)  Yes  No

What do you use the webcam for? (circle any that apply)

To see friends  To meet new people  To keep in touch with family
Other (specify) ____________________________

How many days in a typical week do you play Massively Multiplayer Online Role-Playing Games, or MMORPGs (World of Warcraft, EverQuest, etc.)? 

________

When playing MMORPGs, how many hours do you usually play them? 

________

How many total hours do you usually play MMORPGs each week? 

________

How many real-life friends play MMORPGs with you? 

________

While playing MMORPGs, what aspect of the game do you spend the most time on? (Circle the option that is most applicable)

Raiding  PVP  Levelling  Other (specify)___________

How many hours per week do you work? 

________
How many hours per week do you attend school? __________

What is your highest level of education attained? (Circle the option that best describes you)
High School  Some College  College  Post-graduate
Graduate   Degree  (PhD, Master’s, etc.)

On average, how many hours do you sleep each night? __________