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# Examining Social Anxiety and Depression Among Excessive Online Gamers

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# EXAMINING SOCIAL ANXIETY AND DEPRESSION AMONG EXCESSIVE ONLINE GAMERS

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by
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## Abstract

Examining Social Anxiety and Depression Among Excessive Online Gamers

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The main purpose of this study was to examine the correlations between social anxiety, depression, and other psychological factors among online gamers in order to better understand the differences between excessive gamers (whose habits interfere with relationship, occupational, social, or health issues) and enthusiastic gamers (who spend much of their free time playing games but do not report any significant functional impairment as a result). A literature review revealed diverse conceptualizations of excessive gaming as well as differing opinions of what classifies gaming to be excessive/addicting/problematic, suggesting a need to more specifically analyze gaming habits in terms of coexisting pathology among particular genres of online gamers. Using data obtained from a survey of over 600 online gamers, differences in psychopathology, quality of life, and severity of excessive gaming habits were compared across three gaming media (Massively Multiplayer Online Role Play Games, Internet browser games, and online console games). Statistical analyses revealed differences between excessive and enthusiastic gamers as well as differences across gaming genres. The results show that social anxiety and depression combined are significant predictors of excessive gaming among MMORPG and Internet browser gamers with depression being a significantly stronger predictor. Excessive Internet browser gamers reported the highest level of depression. Additionally, excessive gamers also reported significantly lower qualities of life. Results and implications for practice and future research are discussed.


*Keywords:* excessive gaming, addiction, video games, Internet, massively multiplayer online role-playing games, social anxiety, depression, console gaming

Examining Social Anxiety and Depression Among Excessive Online Gamers

The purpose of this dissertation is to examine the conceptualization of the psychopathology behind excessive gaming and explore those differences across online gaming media. Researchers have struggled to conceptualize the idea of excessive gaming, and scholars have argued that the explanation of excessive gaming ranges anywhere from an addiction, to a unique psychopathology, to failure to self-regulate (Skoric, Teo, & Neo, 2009). Although there is a variety of proposed hypotheses, the field lacks a unified understanding of the psychosocial factors behind excessive gaming, and this review aims to evaluate and organize this literature in a coherent way. Beyond this synthesis of excessive gaming literature, a second goal of this dissertation is to provide a unique contribution to the field by studying different online gaming media as a vehicle for a better understanding of how excessive gaming characteristics and pathologies vary across those media. The third and final aim will be to explore each genre in more detail, and this review will focus explicitly on massively multiplayer online role-playing games (MMORPGs), Internet browser games (e.g., Facebook games like FarmVille), and online console (e.g., Xbox 360, Playstation 3). Because these gaming media can vary considerably in structure, it is first important to understand the differences among them.

Among online PC games, MMORPGs and Internet browser games currently dominate the market (Bell, 2009; Williams et al., 2008). A study by Smahel, Blink, and Ledabyl (2008) found MMORPGs are usually PC-based video games that are played solely online and require the gamer to create a character and join an existing game server that consists of several thousand other players. Smahel et al. (2008) found that MMORPG players average 23 hours a week of gaming and are often regarded as the genre with the highest number of excessive gamers. The

authors found that 9% of MMORPG players report playing more than 40 hours a week, 60% of these players reported playing over 10 hours a day, and 40% self-identified as being addicted.

In an MMORPG, the server the gamer joins is constantly evolving and being shaped by other players, even when the gamer is not logged on. The most popular MMORPGs, such as *World of Warcraft, Everquest 2, and Warhammer Online* (Hill, 2010), are fantasy themed and consist of players battling both virtual non-player characters and characters controlled by other gamers. MMORPGs combine achievement obtained by gaining experience levels, wealth, and equipment with a social component in the form of player-versus-player combat and the formation of social groups that allow for players to work together to complete the most difficult content the game has to offer (Chappell, Eatough, Davies, & Griffiths, 2006). MMORPGs are unique because they do not have a definite ending, making it impossible for a gamer to win or completely finish the game. These games differentiate from Internet browser based games because they are generally run as a separate application or game, rather than run through a website.

Internet browser-based games, often referred to as massively multiplayer online games (MMO), have seen a population explosion resulting in the social networking website Facebook reporting over 70 million active users playing games such as *Farmville, YoVille, and Mafia Wars* (Lillium, 2009). Browser based games are similar to MMORPGs because they are played online and the gamer is part of a larger gaming community. The main difference between browser games and MMORPGs is that browser games are designed for gamers to play in short durations throughout the day rather than staying logged in for long gaming sessions. Browser gamers will log in several times throughout the day to make executive decisions within the game and then wait a period of real time before logging back in to see the results of their work (Yin-Poole,

2009). Browser games are typically easy to learn and are aimed at attracting a broad audience (Yin-Poole, 2009).

The third gaming medium discussed is online console gaming. Console gaming has been one of the popular forms of video gaming since ATARI sold over 10 million ATARI 2600 units between 1979 and 1982 (Sutton, Eisenhardt, & Jucker, 1986). Console gaming requires the physical presence of a game console and television within the household. The most popular consoles of the current gaming generation are the Nintendo Wii, Xbox 360, and Playstation 3 (Electronic Software Association, 2009). Console gaming is the most family friendly gaming medium, particularly with the release of the popular family-oriented Nintendo Wii (Vorhaus, 2008). Although console gaming has historically been single-player oriented, with multiplayer only being possible by having another gamer physically connecting a second controller to the console, recent online console gaming systems such as Xbox Live and the Playstation Network have given gamers an opportunity to take their console gaming online (Cooper & Farber, 2009). Online console gaming also differs from the other two media that are discussed because it is more so a conduit that gamers use to access a wide variety of genres of games that can be played online as opposed to being its own genre.

**Video Game Industry Demographics**

The video game industry has experienced worldwide growth since the 1990s and the number of gamers playing online, on consoles, and within Internet browser-based games continues to grow (ESA, 2009). In the United States alone, the video game business is a $18.8 billion industry (Skoric, Teo, & Neo, 2009) with a customer base comprised of 53% of adults (Lenhart, Jones, & Macgill, 2008a) and over 90% of teenagers (Lenhart et al., 2008b). Some research suggests that 90% of all U.S. children, not just teenagers, are now video gamers

(Young, 2009). Within the adult gaming population, computer gaming is the most popular medium (73%), although console gaming remains popular (53%) (Lenhart et al., 2008a). Internet browser gaming is quickly becoming the world's most popular form of gaming, with games such as *Farmville* achieving over 80 million monthly users (Wei et al., 2010).

As the video game industry continues to experience drastic growth and expansion, gamer demographics have also expanded (Electronic Software Association, 2009). The Electronic Software Association (ESA) publishes an annual report on the current state of the business and demographic information of the video game industry. In 2009, the ESA reported that 68% of American households contained at least one gamer, the average gamer age was 35, and a quarter of American gamers were over the age of 50 (increased from 9% in 1999). Currently, 40% of gamers are female and women over the age of 18 are the fastest growing gamer demographic. For the first time since these data were collected, there are more adult female gamers than male gamers under the age of 17. It is clear that video games are growing in popularity among all ages and both sexes (ESA, 2009). However, the rapid growth of the video game industry has resulted in concerns among parents, teachers, and psychologists that too much gaming can be hazardous to the gamer's health.

**Excessive Versus Enthusiastic Gaming**

Differentiating excessive and pathological gaming from enthusiastic gaming is paramount to forming a universal definition of the way excessive gaming is conceptualized. Research examining excessive gaming has become a popular topic in recent years (Liu & Peng, 2009), with roots tracing back to studies of the video game arcades of the 1980s (Fisher, 1995) and eventually being reshaped by Internet addiction research. Research in the area of excessive video gaming, particularly online gaming, has been consistently compared to the concept of

Internet addiction (Young, 1998a). Before exploring the conceptualization of excessive gaming, it is necessary to understand how excessive gaming is different from enthusiastic gaming and what is potentially harmful about excessive gaming.

There are a number of important, yet often subtle, differences between excessive and enthusiastic gaming. Enthusiastic gamers who play for upwards of 20 hours a week or more only become excessive gamers when the gaming habit becomes an obsession and interferes with their social, marital, occupational, or academic lives (Lafrenière, Vallerand, Donahue, & Lavigne, 2009).

Several researchers have attempted to explain the factors that cause enthusiastic gaming to become excessive. In 2007, Wang and Chu completed a study that examined the influence that passion had on gamers' motivations. This study expanded on an idea presented by Vallerand et al. (2003) that conceptualized passion into two separate parts: harmonious and obsessive. Harmonious passion occurs when someone enjoys an activity to the point of being able to integrate that activity into part of one's own identity while maintaining self-control over the activity. Passion becomes obsessive when the person enjoys the activity so much that he or she fails to successfully self-regulate participation in the activity. Wang and Chu's (2007) results indicated that obsessive passion was positively correlated with excessive gaming and that harmonious passion positively correlates with healthy, enthusiastic gaming.

Enthusiastic gamers with harmonious passion may play just as often as excessive gamers with obsessive passion. The difference between the two is defined by the gamer's ability to maintain control. When the amount of time spent gaming interferes with real-world functioning and the gamer is unable to stop, gaming has become excessive and problematic. This view is supported by Seay and Kraut's (2007) conceptualization of excessive gaming as "consumption of

an entertainment product in such amounts or at such times that it causes demonstrable problems in the user's real life extreme enough to cause an individual to identify and report them" (p. 830). This concept is significant because these results provide evidence that it is possible for a person to take on the identity of an avid, enthusiastic gamer while maintaining control over the activity.

In addition to the theoretical conceptualization of excessive gaming, several biological indicators of excessive gaming have recently been discovered. In another study, Thalemann, Wolfling, and Grüsser (2007) used an EEG to measure the brain activity of self-identified excessive gamers who were presented with gaming stimuli. The EEG recorded brain activity in both excessive and casual gamers who were presented with cues that were either relevant or irrelevant to gaming. The researchers discovered that excessive gamers became significantly more aroused when presented with positive or negative game-related cues than gamers who identified as being more casual. These cues can result in elevated levels of dopamine production, which is known to activate the reward or pleasure system of the brain (Schlimme, 2008). Thalemann, Wolfing, and Grüsser (2007) stated that these data support the argument that excessive gaming can eventually lead to physical addiction symptoms and that excessive gamers begin to process gaming motivations intrinsically, whereas causal gamers do not.

Authors from a more recent study supported these findings be releasing results that also showed a distinct change in the reward pathway of the brain for gamers who identified as being addicts. Weinstein (2010) reported that extended periods of game playing (often reaching excessive levels) results in reduced sensitivity to natural rewards that force the gamer to seek out more intense stimulants. Over time, these changes can look very similar to substance dependence that occurs in when someone is dependent on a physical substance.

Another recent study revealed that biological changes occur within the prefrontal cortex of gamers who are playing to excess or are considered to be addicted (Han et al., 2010). The researchers found that this area of the brain, an area that has previously demonstrated to be related to the craving of drugs such as alcohol, tobacco, and cocaine, reacts in a similar way when excessive gamers begin having a desire to play their game of choice. These biological consequences of excessive gaming may make it more difficult for the excessive gamer to quit because, over time, the excessive gamer becomes intrinsically rewarded when playing games.

**Consequences of Excessive Gaming**

For some gamers, long and sustained periods of gaming may become detrimental to real-world relationships, work and school performance, physical health, psychological health, and daily functioning (Li, Jackson, & Trees, 2008). Each of these areas will be briefly reviewed.

When considering these consequences, diminishing quality of real world relationships is often an indicator of detrimental gaming habits (Chappell et al., 2006). A phenomenon that has arisen as a result of the steep rise in MMORPG popularity is known as the "*Everquest (EQ)* Widow" (Chappell et al., 2006). This term was originally applied to the significant other (usually wife) of an excessive gamer who spent so much time gaming in *Everquest* that the gamer's spouse felt as though the gamer was physically dead. This term has since expanded to describe any significant other affected by a partner's excessive gaming habits.

As a result of the severity of excessive gaming-related consequences, including national losses in productivity due to missed work, the South Korean government has imposed a ban on children under the age of 18 playing online video games between the hours of midnight and 8 a.m. (Wong-ki, 2010). China has instituted similar crackdowns on the hours of Internet cafés as

well as creating similar laws limiting how long children can play online video games (Young, 2009).

It may be easiest to identify excessive gaming when the outcomes are clearly or blatantly detrimental. Southeast Asia has had several cases of gamers playing video games for so many consecutive hours and days that the gaming eventually led to their deaths as a result of exhaustion (Naughton, 2005; Williams, 2007, Wong-ki, 2010). In 2005, a 28 year-old man died after playing *Starcraft* continuously for almost 50 hours. He collapsed at an Internet café and the cause of death was found to be heart failure resulting from exhaustion (Naughton, 2005). In a similar story, a 26-year-old man in China died after a 15-day gaming binge during a holiday (Williams, 2007).

Excessive gamers may be experiencing a variety of psychopathology. Gamers may be suffering from social anxiety, depression, or other psychopathology that influences both gaming habits and the gaming media of choice. A psychologist at the Austin chapter of the International Game Developers Association video game addiction panel, Dr. Vagdevi Meunier, likened the narcissistic self-stimulation of her three year-old daughter kissing herself in the mirror for an hour to an adult spending hours gaming online in order to receive praise and compliments from others (Staehlin, 2003). Dr. Meunier noted that this behavior can become problematic when people start avoiding others in real life because it is easier to get those needs met online and that this is when gaming can become an addiction (Staehlin, 2003). Thus, Dr. Meunier postulated that excessive gaming is more similar to a food addiction than physical drug dependency because the gaming addiction appears to have more to do with an underlying control issue or social struggles that are often associated with eating disorders (Staehlin, 2003).

Depression and suicide are additional psychopathological issues that need to be addressed. Although it is important not to rule out the possibility that excessive gaming may actually be a symptom of pre-existing psychological concerns, some research has demonstrated a correlation between excessive gaming and depression. A 2011 study by Messias et al. that included over 15,000 participants found that teenagers who reported playing five or more hours of video games a day had significantly higher risks of suffering from depression and having suicidal ideation. In addition, there have been several highly publicized incidents of death and suicide that have specifically linked depression and excessive gaming. In 2004, a teen in Tianjin, China committed suicide and left four pages of details concerning his attachment to his *Warcraft III* characters (Golub & Lingley, 2008).

One of the most well-known events concerning deaths linked to gaming occurred in 2002 when a 21 year-old man committed suicide while logged into *Everquest.* When his mother was interviewed she said that her son had quit his job so that he could spend more time playing the game and that he had essentially given up everything else in his life. His mother disclosed that her son was evicted because he had no money to pay rent as a result of spending all of his time in *Everquest* and that he had been diagnosed with depression and schizoid personality disorder. She attempted to sue Verant Interactive, the parent company of *Everquest*, and maintains that the game is responsible for his death (Miller, 2002).

**Examining Excessive Gaming as an Addiction**

As the consequences of excessive gaming become more prevalent, the psychological field continues to struggle to conceptualize the pathology behind these behaviors. There is currently no universally accepted understanding of how psychopathology and excessive gaming habits intersect. There are models that present the concept as a physical addiction similar to drug or

gambling addiction (Young, 1998b), some that use a cognitively based approach (Davis, 2001), and others that use a failure to self-regulate as an explanatory model (Seay & Kraut, 2007). Emerging research has challenged the idea of excessive gaming as an addiction, choosing instead to focus on the specific psychological predictors and outcomes of problematic gaming unique to the individual.

Problematic Internet gaming is often conceptualized as a component of Pathological Internet Use, a term used by Young (1998b) to describe pathology that was very similar to the Pathological Gambling diagnosis in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). Because this was the first and most widely accepted explanation, the topic of excessive gaming has been explored and described as an addiction by a number of researchers (Yee, 2002; Chappell et. al, 2006; Chuang, 2006). Although Young's (1998b) adaptation of DSM-IV addiction criteria into Internet addiction language played a significant role in advancing research in this area, some researchers believe that more specific diagnostic criteria are necessary to more thoroughly diagnose problematic Internet use (Beard & Wolf, 2001). Young's (1998b) initial suggestion for diagnosis of Internet addiction consisted of borrowing eight of the ten criteria for pathological gambling in the DSM-IV and essentially exchanging references to pathological gambling with Internet addiction terminology. According to Young, someone would have to endorse five of the borrowed eight criteria in order to meet the threshold for Internet addiction.

Beard and Wolf (2001) stated that these criteria were too broad, pointing out that a new mother could be considered "addicted" to her newborn using Young's criteria. Therefore, Beard and Wolf proposed a revised criteria for Internet addiction that requires a person to endorse the following five criteria: preoccupation with the Internet, continuously increasing time on the

Internet required to feel satisfied, previous unsuccessful attempts to cut back Internet use, suffering emotional consequences as a result of trying to cut back Internet use, and having stayed online longer than planned. In addition to these five criteria, Beard and Wolf added that a person also had to meet at least one of the following criteria: previously jeopardized work, education, or a relationship because of time spent online, the person has lied about Internet use in order to conceal actual Internet habits, or used the Internet to escape problems or bad feelings. The authors believe that these additional criteria were necessary because an Internet user could meet Young's (1998b) criteria without actually suffering any functional impairment (Beard & Wolf, 2001).

Some researchers have attempted to translate the traditional addiction terminology into language that makes sense within the context for excessive online gaming problems. Griffiths (2010) defined six of the core components of the traditional addiction model in ways that more clearly explained how those factors relate to gaming. The first, salience, was defined as interest in gaming becoming so important to the gamer that when the gamer was not playing he or she suffered cravings. Mood modification occurs when a person uses gaming for an escape or to feel a high. The gamer eventually a builds tolerance in which the gamer has to play more often or for longer periods in order to obtain a satisfying level of mood modification. Withdrawal results in the gamer feeling irritable or moody if he or she is without access to the game of choice for a period of time. Conflict is often the result of the combination of these factors wherein the gamer now experiences functional consequences in school, work, relationships, or physical health. Finally, the author suggests that gamers who meet addiction criteria are also at risk for a relapse and could potentially fall back into these habits. Griffiths also notes in this article that the partial reinforcement effect of online video games that is often present in MMORPGs and Internet

browser games is well suited to creating a potentially hazardous gaming environment in which players may be at risk of falling into addictive or excessive habits.

In one the first attempts to research and conceptualize MMORPG addiction, Yee (2002) published an online study that was inspired by reports of suicide due to perceived addiction to MMORPGs. Yee compiled information from the survey responses of online gamers in order to understand gamers' perspectives on their own gaming habits and attitudes toward the concept of online gaming addiction. The results showed that nearly 40% of the approximately 2800 males surveyed considered themselves addicted to a game. Yee drew comparisons to substance addiction, claiming that a substantial portion of gamers suffer similar dependence and withdrawal symptoms. Almost 15% of nearly 4000 gamers surveyed endorsed feeling anxious, irritable, or angry if they were unable to play the game when they wanted to. A quarter of those same respondents reported feeling better about themselves while playing the MMORPG *Everquest.* Eighteen percent of those who responded to the survey acknowledged that their excessive gaming habits had resulted in academic, health, financial, or relationship problems. Yee noted a negative correlation that emerged between self-esteem and self-described game addiction. Approximately 10% of respondents endorsed feeling like a failure and of that 10%, most endorsed feeling addicted to the game. Nearly one-third of the respondents reported continuing to play *Everquest* even when it became frustrating or no longer an enjoyable experience, similar to pathological gamblers who find themselves unable to quit even when the gambling is no longer enjoyable or profitable.

The research on the prevalence of MMORPG addiction by Yee garnered much attention within the gaming community, and it assisted in creating a dialogue in regard to the conceptualization of excessive online gaming. In 2006, Yee revisited this study and on his

website he updated his opinion on whether he believed excessive MMORPG playing was an addiction. Yee no longer believed that addiction is the correct terminology to describe problematic gaming and that it can actually be a detrimental label, decreasing the likelihood that a gamer may seek help. Yee claimed that, for some gamers, excessive gaming can become one of many behavioral tendencies that are not unique to the MMORPG experience and that excessive gaming may actually be a symptom of other psychological issues.

Researchers in the video game industry have also shown concern over the increasing problem of excessive gaming. In January of 2003, the Austin chapter of the International Game Developers Association hosted a panel of speakers to discuss the concept of online game addiction (Staehlin, 2003). Mike McShaffry, a game developer on the panel, discussed the sunk cost fallacy and applied it to excessive gaming. McShaffry drew a connection to the same phenomenon occurring in pathological gamblers Arkes and Ayton (1999) defined the sunk cost effect as "a maladaptive economic behavior that is manifested in greater tendency to continue an endeavor once an investment in money, effort, or time has been made" (p. 593). When a gambler believes too much money has been lost through unsuccessful gambling ventures, it becomes more difficult for the compulsive gambler to walk away from the perceived investment, and the gambler continues to lose money (Arkes & Ayton, 1999). For an excessive gamer who has spent over a year developing a character that has acquired power and/or prestige within the gaming world, the idea of quitting an endeavor that he or she has committed so much time and effort to becomes increasingly difficult because the gamer believes that if the game ends, all of that time spent was a waste. The longer the gamer plays, the harder it will be for the player to detach from the virtual world without feeling as though there has been a major loss on time

invested. It is conceivable that this mindset may make quitting seem nearly impossible for some excessive gamers.

Although the hypothesis that excessive gaming is similar to compulsive gambling in pathology is popular among some researchers, there are others who disagree. Brown (1993) identified six criteria that were vital to diagnosing problematic gambling behavior: tolerance, euphoria, salience, conflict, withdrawal, and relapse. Charlton (2002) built on Brown's research and examined how these same factors would load on excessive computer use (including gaming). He found that, when applying these same criteria to excessive computer use, only behavioral salience, conflict, relapse, and withdrawal were related to excessive computer use. In contrast, cognitive salience, tolerance, and euphoria all loaded on Computer Engagement Factor, which Charlton considered to be evidence of healthy, enthusiastic computer use because these characteristics were associated with all gamers. Seay and Kraut (2007) used this study as evidence that problematic online gaming may not be equivalent to a compulsive gambling behavior as some previous research has suggested. While many scholars agree that there are psychological differences between excessive and enthusiastic gamers, there is still debate among researchers (Chappell, Eatough, Davies, & Griffiths, 2006) in regard to the unique nature of excessive gaming.

**Alternative Conceptualizations of Excessive Gaming**

Within this debate, there is continued disagreement in regard to what specific psychosocial factors influence excessive gaming. Although there is some evidence that can support the addiction approach to the issue (Charlton, 2002) and there are some current assessment instruments for excessive online gaming in children based on this theory (Hagedorn & Young, 2011), other research attempts to explain excessive gaming as something that is not

best described by the traditional DSM-IV definition of addiction. Gamers playing to excess may actually be experiencing a variety of psychological stressors, including social anxiety and depression (Yee, 2002). Other proposed conceptualizations include components of Bandura's social cognitive theory, failure to self-regulate, adapted cognitive dissonance theory, and trait theory. (Seay & Kraut, 2007; Kim, Namkoong, Ku, & Kim, 2008; Charlton, 2002)

Despite relatively few studies that examine the effect of excessive gaming over long periods of time, a few researchers have attempted to explain the progression of enthusiastic to excessive gaming. Seay and Kraut (2007) completed a longitudinal study of online gaming activity among nearly 2800 respondents over the course of 14 months. The authors challenged the addiction conceptualization by exploring the way gaming attitudes and behaviors adapt and change over a period of time. In addition to challenging addiction model beliefs, Seay and Kraut hypothesized that the major factor affecting excessive gaming behavior is a lapse in self-regulatory behavior.

The idea of self-regulation originates from Bandura's (1999) social cognitive theory of personality that describes the individual as "proactive, self-organizing, self-reflective, and self-regulative" (p. 33) rather than as a reactive organism shaped solely by external events or circumstances (Seay & Kraut, 2007). The concept of self-regulation is based upon the ability of a person to monitor and adapt his or her own behaviors. Kanfer (1970) described the main factors contributing to self-regulation as self-motivation (introspective observation and awareness), self-evaluation (noticing time spent on one activity compared to others), and self-consequation (the ability to self-impose rewards or punishments). Seay and Kraut (2007) found that respondents to the survey who reported having deficits in self-evaluation became more vulnerable to developing problematic gaming behavior. Their results also indicated that

depression diminishes a person's ability to self-regulate. If a gamer is already suffering from depression, it will be harder for him or her to self-regulate gaming, and some gamers, particularly children, may need assistance in increasing awareness of the problematic behavior. Although this information helps describe the progression of excessive gaming behavior, Seay and Kraut's findings in regard to depression further complicates the debate as to whether excessive gaming is the result of, or a symptom of, psychopathology.

Some researchers have taken an even more cognitively-based approach to conceptualizing the issue. Davis (2001) proposed a cognitive-behavioral model of pathological Internet use (PIU) that has been cited in several pieces of excessive gaming research. This model's structure suggests that a combination of shyness, maladaptive cognitions (such as identifying as being a more valuable person online than offline), and depression were some of the most significant qualities that may lead a person to use the Internet in a pathological way. Wei and Ming (2010) adapted this model specifically to look at online gaming dependency and found that the model was able to explain a significant portion of the variance in regard to pathological gaming. The authors believe that when these three factors lead to excessive gaming habits, it is highly likely that the person will experience physical, relational, or professional problems.

Other researchers believe that excessive gaming results from the interaction of pre-disposed traits and the environment. Kim, Namkoong, Ku, and Kim (2008) used trait theory as a framework to explore the connection between online gaming and three traits (aggression, self-control, and narcissism) that were characteristic of populations who were considered at-risk for excessive gaming. The researchers hypothesized that gamers who reported higher levels of aggression and narcissism would be more susceptible to excessive gaming and that gamers who

had higher levels of self-control would be less likely to play to excess. Although their results supported the hypotheses, the authors acknowledged that the trait-focused approach only accounted for 20% of the variance in excessive gaming.

More recently, researchers have attempted to conceptualize this issue in terms of traits that may be predictive of excessive gaming. Results from a recent study suggest that several traits including neuroticism, trait anxiety, state anxiety, aggression, and sensation seeking were all significantly associated with people who were identified as excessive gamers (Mehroof & Griffiths, 2010). The authors note that the sensation seeking trait was particularly associated and suggested that this was because excessive online gaming would help solve boredom or a desire for more stimulation. This finding supports some of the biological evidence suggesting changes in the reward center of the brain associated with long-term excessive gaming that are discussed in this dissertation.

Researchers have also used trait theory to better differentiate what makes an enthusiastic gamer different from an excessive or problematic gamer. Charlton and Danforth (2010) explored these differences and found that, when an MMORPG gamer met their criteria for addiction, those gamers demonstrated decreased extraversion, agreeableness, emotional stability, and attractiveness than those who enthusiastic played games without negative consequences. The authors had actually anticipated that enthusiastic gamers would exhibit these same traits to a lesser degree, but they instead found that there was no significant correlation on any of these traits for enthusiastic gamers. The results showed that the traits accounted for 20% of the variance in addicted gamers and only 2% of the variance in enthusiastic gamers. Combined with the previous research described in this section, these findings suggest that, although self-

regulation, flow, and certain personality traits influence the incidence of excessive gaming, they are not sufficient in fully explaining the phenomenon.

## Comparing MMORPGs, Internet Browser Games, and Online Console Gaming

Demographics and motivation vary among enthusiastic gamers depending on the gaming medium of choice. For excessive gamers, there are specific psychopathological concerns that are medium-specific. In order to examine and understand the differences in motivation and psychopathology specific to excessive gamers on a particular gaming medium, it is important to understand the details of the game mechanics that make each of these gaming experiences unique.

### MMORPGs

Although there are subtle differences in aesthetics and mechanics among individual games, standard components are found within every successful MMORPG. According to the World of Warcraft Game Guide (2010) hosted on the game's official website, the process begins with player creating an avatar. The avatar is the virtual representation of the player and is the central figure through which the person will be interacting with the online world. Most games initially ask players to choose their gender, race, and alignment (good or evil). Next, the player must decide the class, or specific job that the character will take on. The kind of avatar a player chooses dictates the role of the player in the world and requires the gamer to adopt a unique play style in order to thrive within the game.

After the player creates an avatar, the player is connected to the gaming world with the rest of the players via the Internet (World of Warcraft Game Guide, 2010). Most MMORPGs contain a level or rank system that each player progresses through as the character becomes increasingly powerful. As a player successfully completes quests that involve hunting monsters,

killing rival factions, or discovering new lands, the player will obtain higher levels, new skills, and powerful weapons and armor. High level players strive to achieve the best weapons, armors, and rewards in comparison to their peers. This social competition is a significant component of the MMORPG experience (Fritsch, Voigt, & Schiller, 2006).

Although these ranks or levels can be achieved by players individually, MMORPGs are uniquely designed to encourage social interaction, cooperation, and competition among other players in the world. At the most basic level, players can interact with other players in either a chat-room style text box, by other avatars they come across, or by using a microphone and headset to verbally chat with other players (Wadley, Gibbs, & Benda, 2007). These interactions can take many forms, ranging from ignoring other players, to interacting with other players only when necessary, to logging in for the sole purpose of socializing. Gamers are encouraged to join other players and cooperate to achieve shared goals and work their way through dungeons (World of Warcraft Game Guide, 2010). These groups of players are often temporary and may break up upon completion of a particular quest; however, these alliances can sometimes become permanent.

MMORPGs offer their players the opportunity to join together and create permanent alliances, often known as guilds or clans. A study by Chen, Sun, and Hsieh (2008) found that the guild system is one of the most important social aspects of MMORPGs. The authors report that guilds develop their own personality and have member requirements based on the overall goal of the guild. There is considerable variety among guild structures as some guilds are smaller in size and call themselves family style guilds. Chen et al. also found that these guilds often are comprised of casual gamers of all ages who are looking for a consistent group of players to share

their gaming experience, and they hope to build in-game relationships in a low pressure, friendly environment.

Other players may choose to join a role-play guild. Role-play guilds are typically comprised of members who choose to play the game as if the player is the avatar and seek to create a totally immersive experience (Chen et al., 2008). Gamers who are role-playing usually do not focus on real-world discussions and are often more interested in organizing in-character social activities or developing a story for their character rather than only striving to develop the most powerful character possible (Chen et al., 2008).

For the more serious gamer who is interested in completing the game's most challenging content, there are endgame guilds. Fritsch, Voigt, and Schiller (2006) describe these guilds as being comprised of dedicated gamers, commonly referred to as hardcore gamers, who typically dedicate more than a full-time work week to their weekly gaming habits. Hardcore gamers are usually the highest achieving and most powerful players in the gaming world. The authors report that these guilds are highly competitive, often require an application process, and are highly selective. Endgame guilds require a significant time commitment and are only for players who seek the most challenging content the game has to offer. The gamer's choice of guild ultimately offers a very different gaming experience. Fritsch et al. note that the creation of an avatar, selection of class, play-style selection, and guild membership are all paramount to the MMORPG experience and provide clues as to the motivation of the gamer.

**Demographics of MMORPGs.** The most popular game, Blizzard Entertainment's *World of Warcraft*, was originally released in November of 2004 and now boasts a subscriber base of more than 11.5 million (Williams et al., 2008). Although console gamers are most often children, Williams et al. discovered that the average MMORPG gamer was 33 years old. The

authors also found that approximately 20% of the MMORPG population is female. In fact, adult female gamers tend to put more hours into their MMORPG experience in comparison to adolescent males (Chappelle et al., 2006). The average MMORPG player will spend around 25 hours a week in the virtual world of choice whereas approximately 10% of hardcore MMORPG gamers will play in excess of 40 hours (Smyth, 2007).

**MMORPG gamer motivation.** MMORPG players often have different motivations for getting involved in their particular game. Yee (2006) identified three separate factor structures to describe what motivates gamers to play a game: achievement, social, and immersion. Motivation that is mostly driven by achievement results in a desire for character advancement, an understanding and exploitation of game mechanics, and a high degree of competition. Motivation governed by social factors seeks chat-box or voice interactions, casual conversations about the game and the real world, the development of long-term social relationships, and an overall sense of teamwork. Finally, motivation that is mostly influenced by immersion results in players who value geographical exploration of the world, role-playing, a strong connection to the avatar, and a sense of escapism. Although all gamers are motivated by all of these factors to some degree, Yee found that the factors described in each of the three structures tended to cluster together. Gaining insight into what motivates an excessive gamer may provide an opportunity to conceptualize the psychological processes involved.

Although theories about gamer motivation can be helpful in understanding what makes MMORPG gaming potentially problematic, it is equally important to spend time listening to gamers to hear their perspectives. Chappell et al. (2006) used online forums to obtain unsolicited qualitative data about MMORPG players' experiences. The researchers found that initially many people are drawn to the idea and mechanics behind the game. One participant noted that playing

an MMORPG is like no other gaming experience because the gamer is immersed in a world that is completely open-ended, and it is up to the player to create the story for the avatar. Another participant explained, "I felt free, free of constraints and guidelines, free to create my character's own path instead of following in the footsteps of some strategy guide…every accomplishment was my accomplishment, and every accomplishment brought true satisfaction" (Chappel et al., 2006, p. 208). This sense of freedom to explore and create with few boundaries may be particularly appealing for excessive gamers who are feeling trapped or unsatisfied in the real world (Yee, 2002).

**Social needs and MMORPGs.** Playing an MMORPG can be a place where a player is able to make a significant number of perceived friends or acquaintances in an amount of time that is often shorter than what may need to be invested in a real-world relationship. Another respondent in the Chappell et al. (2008) study explained that, after moving to a new city for a temporary job assignment, he felt that playing an MMORPG was one of the few ways to maintain a sense of social connectivity. Recent research suggests that although making friends in an MMORPG environment can be a healthy exercise, those who are playing MMORPGs to excess report having fewer real-world friends (Porter, Starcevic, Berle, & Fenech, 2010).

The relationships within these games carry very little risk due to the relative anonymity of the player behind the avatar. Hussain and Griffiths (2008) explored the interactions among online gamers and made a number of interesting observations. If an interaction is not going well, the player can simply enter a command to ignore any communication from the other party, log off, or create a new avatar that will have a clean social slate. These interactions can also be easier to initiate because the players involved are provided with a commonality that may help initially build the relationship. The ease of building these relationships may be particularly

appealing for those who struggle to create or maintain relationships in the real world because of social anxiety or social skill deficits.

Some gamers believe relationships formed and maintained through MMORPGs can be rewarding, enriching, and just as significant as those relationships formed in the real world. Hussain and Griffiths (2008) used an exploratory study to try to gain insight into what players found socially appealing about playing an MMORPG. In their study, 28% of respondents said that playing online games satisfied some kind of social need that was not being met in real life. One respondent said, "I can go anywhere and talk to anyone and not seem strange" (Hussain & Griffiths, 2008, p. 49). One in five of the gamer respondents preferred virtual socialization over real world face-to-face interaction (Hussan & Griffiths, 2008). Another respondent noted that "people are more open to accept each other. Good or bad, you are judged on how you interact with other participants, not…on physical appearance" (Hussain & Griffiths, 2008, p. 50). The atmosphere of acceptance that can be found within MMORPGs adds to the social allure of MMORPGs for those who lack social skills or those who are not getting social needs met in the real world (Hussain & Griffiths, 2008).

Because of the formation of these in-game relationships, there is a clear sense of community that allows for socialization and interaction beyond playing the game within MMORPGs. The gamer may make friends by completing quests together or elicit compliments from other gamers because of equipment or wealth the gamer has accumulated as a result of excessive play. Another respondent to Chapelle et al. (2006) described that the social appeal can be more alluring than the actual design of the game and that joining the game is similar becoming a new member in any other real-world community. The unique experience of participating in an MMORPG created a space in which this respondent was able to form intimate

relationships and share triumphs and struggles with a group. This response also indicates that the socializing was not confined to game-related issues, but that relationships are often being formed based on discussions about the real world.

Some gamers perceive their online relationships to be equal to their real-world relationships. Cole and Griffiths (2007) examined various social interactions and their impact on players within an MMORPG community. Nearly a thousand self-selected gamers from 45 different countries responded to an online questionnaire that contained various questions about the social experience when playing an MMORPG. Cole and Griffiths' results revealed that many gamers take their online relationships very seriously. Three-quarters of gamers who responded to this study said they feel as though they have made good friends through participation in online gaming. Nearly half of those who filled out the questionnaire said they believed their online friends were comparable to any of their real world friends. Some of these interactions seem to carry the same emotional weight as other relationships, including relationships of a romantic nature. Approximately one-third of the respondents said they had found themselves romantically attracted to another player. Ten percent of these players have started a physical real-world relationship with another player as a result. Almost 40% of those who were surveyed indicated that they felt more comfortable sharing and discussing sensitive personal issues with their online friends as opposed to having the same conversations with their real-life friends.

**Unique health consequences.** Although much of the research on excessive gaming focuses on psychopathology, there are also studies that have described health risks that may be unique to excessive play of MMORPGs. A 2006 study by Chuang reported that MMORPG players may be susceptible to a type of seizure that is unique in comparison to previously studied

video game induced seizures and that this is a topic requiring the attention of "physicians, educators, sociologists, and global online game publishers" (p. 451).

In a study that examined habits related to specific gaming media, Smyth (2007) encountered results that indicated problematic physical health and excessive MMORPG playing may be linked. In this study, college students were assigned to one of several groups who were instructed to play games on only one gaming medium. The group assigned to play an MMORPG reported spending significantly more time playing the game than was required of them to complete the study, had lower physical health, lower sleep quality, and reported a less healthy diet than any of the groups of gamers. These physical risks, coupled with the previously noted psychological risks, support the position that excessive MMORPG playing is a serious public health issue that must be addressed.

**Internet Browser Gaming**

Although also played online, Internet browser games are often built differently from stand-alone MMORPGs. These games are usually free to play, although some may have a built-in online store function where real-world dollars are used to buy in-game items that require significant time to obtain otherwise. In an article exploring the appeal of browser games, Klimmt, Schmid, and Orthmann (2009) labeled browser games as "easy-in, easy-out" (p. 231) because of the flexibility involved in the browser gaming experience. Gamers can log on and play whenever they want and be productive even if they can only play for 5 minutes at a time. Browser games typically require the user to login, make game management decisions, and then wait a specific period of time before he or she can log back in and see the results of earlier decisions. For example, in *Farmville*, gamers maintain a virtual farm complete with crops, animals, and facilities management. Wei et al. (2010) further explored *Farmville* gaming habits.

The authors note that after logging in, a gamer chooses a crop to plant and then must periodically come back to water the crops and manage the growing process until a specific amount of time passes and the crops blossom. The gamer must then log back in and harvest the crops to sell before the crops wither and die. This style of gaming results in the player logging in several times throughout the day and playing in short segments rather than the gamer playing for one extended period of time as in MMORPGs.

In many ways, browser games are built to attract long-term play. Developers who create browser base games attempt to appeal to a broad audience and use time-restricted progression to ensure that gamers must either spend real money or play over the course of weeks, months, and potentially years in order to be successful. In a 2009 study, Martinez reported that browser games typically encourage cooperation rather than competition among the gaming community where Facebook friends help each other become more successful. The combination of easy access game design and social networking may attract gamers to indulge to the point of gaming becoming excessive.

In addition to the difference in game design, the motivations for browser gamers reveal some potentially unique pathology that may be linked to excessive browser gaming. Klimmt et al. (2009) used Yee's (2006) previously mentioned motivational factors model to examine the browser gaming habits of over eight thousand players of the browser game *Travian.* The authors found that, although browser gamers are highly motivated by the social aspect of the games, the gamers were nearly as motivated by the desire to use the game as a coping mechanism.

**Online Console Gaming**

As described in the introduction, console gaming is less similar to MMORPGs and browser gaming because it involves the physical use of a gaming console connected to a

television in order to play. Console gaming is also different from MMORPGs and browser gaming because the label "console gaming" is not a descriptor of a gaming genre like the other two. Instead, gamers purchase a console and then rent or purchase a variety of games they play *on* the gaming console. For example, an online console gamer who owns an X-Box 360 may purchase and play a first-person shooter like *Halo 3*, a racing game such as *Forza Motorsports 2*, or a strategy game like *Civilization Revolutions* (X-box.com Games Home, 2010).

Despite these general differences between MMORPGs and console games, it is important to note that, with the invention of online gaming services for consoles, such as *X-box Live*, console gamers may also become online gamers (Xbox Live, 2010). Although some games such as *Everquest Online Adventures* and *Final Fantasy 11* are actually MMORPGs, most console games played online are single-serving challenges against another console gamer, such as a game of football, a virtual board game, or an online deathmatch where a victor is crowned after a certain number of other player kills and the gamer may never have interacted with the opponent beyond the mechanics of the game. Although these games can be played offline, for the purpose of this study, only games that can be connected and played online with other gamers will be explored.

**Genre matters.** Because the style of console gaming varies depending on the genre of game selected by the gamer, researchers have discovered that different kinds of psychopathology may be connected to gamers who are drawn to specific genres of games. First-person shooter games (FPSGs) generally require the gamer to take on the identity of the protagonist and experience the violent adventure as if he or she was looking through that protagonist's eyes (Adams, 2010). Much of the research on console games has focused on examining the consequences of playing violent video games (Ferguson, 2007). In 2008 Staude-Müller,

Bliesener, and Luthman reviewed literature examining correlations between violent video games, including FSPGs, and violent behavior. The authors found mixed results in regard to the connection between violent video gaming and violent behavior and concluded that the connection between violent games and violent behavior is vague at best. Gamers who choose FPSGs are generally adolescent males who game at least 2.5 hours a day and if the gamer becomes good enough, they may join an online group of equally skilled players often known as clans (Jansz & Tanis, 2007). FPSG gamers who become highly skilled and join clans are often the most enthusiastic FPS gamers who spend a considerable amount of leisure time playing their game of choice (Jansz & Tanis, 2007). There is little research examining the impact of playing FPSG games online.

**Unique Gaming Experiences (self-regulation and flow).** The most recent article published on the topic of flow and online gaming behavior asserts that flow is the number one most significant predictor of why people choose to play, and continue to play, online video games (Lee & Tsai, 2010). The authors found that, although gaming attitudes, perceived enjoyment, and perceived behavioral control were also important factors, when a gamer reports a high level of flow, the gamer is far more likely to report positive experiences with the game.

There is also some evidence that excessive online console gaming may best be conceptualized in terms of flow and failed self-regulation. Rau, Peng, and Yang (2006) conceptualized problematic gaming using a combination of the concept of flow and time disorder theory. The authors describe flow as the balance between a person's skill set and appropriate challenge level of a given activity. A gamer experiences flow whenever the highest level of enjoyment of the gaming experiencing is reached. When a person is experiencing flow, there is a sense of total immersion in the experience, resulting in complete attention and an increased risk

of losing track of time (Voiskounsky, Mitina, & Avetisova, 2004). Rau et al. (2006) found that excessive gamers are prone and vulnerable to time distortion and that children in particular may require assistance in developing healthy gaming strategies that allow for breaks from the action to avoid problematic social consequences.

In a similar study, Wan and Chiou (2006) applied the idea of flow to humanistic needs theory while studying Taiwanese adolescent's gaming behaviors. Their findings were in contradiction to the Rau et al. study as Wan and Chiou's results revealed that flow was negatively correlated with excessive gaming inclination and those gamers who identified as excessive gamers reported experiencing a much lower incidence of flow. The authors expanded on this idea and found that self-identified addicted and non-addicted gamers played video games to get different humanistic needs met. Their results showed gaming provides a relief from dissatisfaction to excessive gamers whereas it provides a sense of satisfaction to enthusiastic gamers.

Whether it is result of flow, an attempt to get humanistic needs met, or another explanation, excessive online console gamers' main problem is a failure to self-regulate, resulting in a failure to end the gaming, even if there are other chores that need to be accomplished (Lee & LaRose, 2007). Excessive online console gaming becomes problematic when the gamer loses track of time or becomes so focused on completing the next game, level, or match that homework and relationships become neglected (Lee & LaRose, 2007). The body of research examining online console gaming is nearly non-existent, providing a clear opportunity to develop research on the topic.

Some of the reviewed literature has suggested that unmet, real-world social needs may influence excessive MMORPG players (Cole & Griffiths, 2007) more than excessive players on

other gaming media. Although some gamers believe they can get their social needs met online (Chappell et al., 2008), this author believes gamers who are playing MMORPGs to excess and experiencing negative social, educational, or vocational consequences may be using their gaming as a way to maintain social avoidance behaviors while attempting to develop "safer" online relationships. Currently, some evidence has shown excessive gaming is negatively correlated with social self-efficacy and real-world familial relationships (Jeong & Kim, 2011). Thus, the first purpose of this study was to examine and compare the reported incidence of social anxiety symptoms between participants who identified as excessive online gamers versus those who did not with the expected result being that excessive online gamers report experiencing more social anxiety.

Although similar to MMORPGs, Internet browser gaming is comprised of a broader demographic (Wei et al., 2010) and utilizes different gaming mechanics that could be associated with different kinds of excessive gaming pathology. Because of the easy in, easy out nature of browser gaming (Klimmt et al., 2009), this gaming medium may be more appealing to gamers who are bored and are looking for a way to spend downtime. The social aspect of browser gaming is different from MMORPGs because browser gaming communities typically focus more on working together rather than competing. Many browser gamers often use their gaming as a coping strategy (Klimmt et al., 2009) and because depressed people are struggling to cope, are typically less active, and often need more social support, the second purpose of this study was to explore the reported depressive symptoms of self-identified excessive Internet browser gamers with the expectation that they will endorse more symptoms of depression than gamers who are not playing excessively.

The third purpose of this study was to explore whether, regardless of gaming medium of choice, gamers who identify their gaming habits as excessive are more likely to have pre-existing psychopathology than those who do not identify their gaming habits as excessive. If this hypothesis were confirmed, it was expected that excessive gamers will exhibit more psychopathology than those who do not game to excess. Because of this psychopathology, it was anticipated that excessive gamers would endorse lower quality of life scores than those who did not game to excess.

The fourth and final purpose of this study was to examine whether the use of a particular gaming medium make a difference in regard to overall psychopathology among excessive gamers. Because MMORPGs tend to require the most commitment out of three gaming genres explored, it was hypothesized that MMORPG players who were playing to excess would also experience the most functional impairment in terms of depression and social anxiety severity. If the hypothesis was confirmed, I would expect to see excessive MMORPG gamers endorse the highest levels of social anxiety and depression, followed by excessive Internet browser gamers, followed by excessive online console gamers.

## Methods

### Participants

Participants were recruited online through a link to the Surveymonkey website where they completed the survey found in the appendix. All respondents indicated they were over the age of 18. A total of 784 adult participants completed at least a portion of the online survey, with 608 participants completing enough of the survey to be included in the data analysis. Responding to the demographic questionnaire portion of the survey was voluntary. Of those

who responded, 376 identified as male and reported an average age of 25. There were 294 female respondents who reported an average age of 24.

Respondents were given the opportunity to identify their nationality and self-identified race/ethnicity through voluntary, open-ended questions. Although the majority of respondents were American (*n* = 428), there were a number of International respondents that included Canada (*n* = 26), Australia (*n* = 13), England (*n* = 22), and several other European, Asian, and South American countries (*n* = 35). The overwhelming majority of respondents identified as White or Caucasian (*n* = 446) although there were respondents who identified as Black or African American (*n* = 17), Multiracial (*n* = 11), Latino (*n* = 12), and Asian (*n* = 13).

Gamers who identified as MMORPG players reported playing an average of 16 hours a week (*n* = 264). Additionally, respondents who reported playing *World of Warcraft* were given the opportunity to report the number of hours they spent playing (all-time) on their main character. On average, these respondents averaged 140 days' (3360 hours) worth of time logged into their *World of Warcraft* account and playing their main character (*n* = 96).

Gamers who identified as Internet Browser gamers reported playing an average of 5 hours a week (*n* = 212). Those who reported playing Online Console games played approximately 9 hours a week (*n* = 277).

## Measures

**Demographic/biographic/gaming history.** The following demographic and biographical information was solicited from each respondent: age, gender, ethnicity, country or state of residence, employment or educational status, endorsement of previous psychological diagnosis or treatment, geographic region, marital status, weight, activity levels, and several questions in regard to gaming habits. The respondents were asked whether they identify as an

"addict." Respondents had the opportunity to omit any demographic/biographic information they do not wish to answer. These questions assisted in answering each of the three hypotheses. See attached survey in appendix for more details.

**Social anxiety.** Social anxiety was measured using the revised Social Interaction Anxiety Scale (SIAS). Participants responded to 19 items related to DSM-IV social anxiety disorder criteria on a five point Likert scale (Carleton et. al, 2009). The SIAS has demonstrated high levels of validity, test-retest reliability, and internal consistency (Rodebaugh, Woods, Heimberg, Liebowitz, & Schneier, 2006). In a study by Brown et. al (1997), the SIAS demonstrated an ability to correctly classify 86% of subjects diagnosed with social phobia and 50% of subjects identified as having panic disorder with agoraphobia.

**Depression.** Incidence of depression was measured by the Major Depression Inventory (MDI). Participants will respond to 12 questions on a five point Likert scale. In a study by Ayalon (2010), the MDI has demonstrated to be highly reliable ($r = 0.83$). Research investigating the validity of the MDI found it to have an acceptable level of sensitivity in regard to the cut-off scores specifying mild, moderate, or severe depression (Bech, Rasmussen, Olsen, Noerholm,& Abildgraard, 2001). In addition to the provided scoring guidelines, the MDI can be scored diagnostically using the DSM-IV (Bech, Rasmussen, Olsen, Noerholm,& Abildgraard, 2001).

**Quality of life.** Quality of life was assessed using 11 items on a five point Likert scale adapted from the World Health Organization Quality of Life-BREF (WHOQOL-BREF). The original assessment is 30 questions long and the author decided to use items that were most relevant to the questions posed in this study. The WHOQOL-BREF has demonstrated good reliability with Cronbach's α that were greater than 0.7 for all measured domains (Skevington,

Lotfy, & O'Connell, 2004). The WHOQOL-BREF also demonstrated good construct validity across all domains (Skevington, Lofty, & O'Connell, 2004). The adapted items provided acceptably face valid responses in regard to the specific questions asked.

**Excessive Gaming.** Excessive gaming symptoms were assessed using the Game Addiction Scale (GAS). Participants responded to 21 items on a five point Likert scale. The GAS uses three questions designed to investigate each of the seven criteria for addiction as defined by the DSM-IV. Research on the instrument has demonstrated high reliability and concurrent reliability in regard to measurement of online gaming addiction (Lemmens, Valkenburg, & Peter, 2009). In addition to the GAS, respondents responded to the three Internet addiction functional impairment questions proposed by Beard and Wolf (2001) that were modified to ask specifically about gaming rather than Internet use to assist in differentiating between enthusiastic and excessive gaming.

**Procedure**

Data were collected over a 4-month period with participants recruited from the forums of popular online video gaming websites and the Marshall University SONA system. Participants were provided with a link to an anonymous survey hosted by Survey Monkey. All respondents who provided birthdays that indicated an age less than 18 were thanked for their participation and redirected to the online resources page that provided contact information for the researcher as well links to several excessive gaming treatment websites including Online Gamers Anonymous (http://www.olganon.org/), Social Anxiety Support (http://www.socialanxietysupport.com/), and Mental Health America (http://www.nmha.org/go/find_support_group). Respondents were advised to contact the police, utilize hospital resources, call the national suicide prevention hotline, or contact a local mental

health professional if they believe they are in crisis or any concern for the safety of themselves or others. Approval from the Marshall University Institutional Review Board was obtained prior to the solicitation of survey responses.

The length of the questionnaire required approximately15-30 minutes to complete depending on how much gaming the participant was reporting. Because participation in the survey was completely voluntary, participants had the option to quit at any time. Participants who did not complete enough of the survey to allow for comparison across all of the measures were discarded for the purposes of this study. All data were transferred from Survey Monkey into Microsoft Excel for data cleaning and coding and then analyzed using SPSS.

## Results

### Hypothesis 1

The first hypothesis examined the predictive relationship of social anxiety and depression on the severity of excessive gaming among excessive MMORPG gamers. In order to analyze this hypothesis, a standard multiple regression was performed. Independent variables were respondent scores on the SIAS as a measure of social anxiety and the MDI as a measure of depression. The dependent variable was the respondents' scores on the GAS as a measure of the severity of excessive gaming. A score of at least 36 on the GAS coupled with an endorsement of at least one functional impairment criteria meant that the gamer met criteria for excessive gaming. Participants who both identified as primary MMORPG gamers and met the stated criteria for excessive gaming were included in this analysis. All values are significant at the .05 level unless stated otherwise.

Before running the multiple regression, Pearson correlations were used to examine the relationship between the variables to ensure that the scales were appropriate to use in a

regression. SIAS and MDI demonstrated a moderately strong, positive correlation, $r = .68$, $n = 126$. GAS and SIAS demonstrated a medium, positive correlation, $r = .33$, $n = 126$. GAS and MDI demonstrated also demonstrated a medium, positive correlation, $r = .46$, $n = 125$. The measures were all at least moderately correlated with each other, demonstrating that they were appropriate candidates for a multiple regression.

Standard multiple regression revealed that the combination of SIAS and MDI scores accounted for 21.4% of the variance, $R^2 = .214$, $F(2, 122) = 16.65$. These data suggest that a combination of social anxiety and depression can be considered significant predictors of severity of excessive gaming in MMORPG gamers.

When the independent variables were considered separately, depression scores on the MDI made a significant contribution to the model ($\beta = .45$, $t(122) = 4.1$), accounting for a unique 10.7% of the total variance. The other independent variable, social anxiety, was not a significant contributor to the model, $\beta = .02$, $t(126) = .22$. These results mean that hypothesis that expected social anxiety to be a significant predictor of excessive gaming severity among excessive MMORPG gamers cannot be confirmed.

**Hypothesis 2**

The second hypothesis examines the ability of social anxiety and depression to predict the severity of excessive gaming among excessive Internet Browser gamers. In order to analyze this hypothesis, a standard multiple regression was performed. Respondent scores on the SIAS as a measure of social anxiety and the MDI as a measure of depression were used as predictors of the respondent's scores on the GAS. Participants who identified as primary Internet Browser gamers and met the stated criteria for excessive gaming were included in this analysis. All values are significant at the .05 level unless stated otherwise.

Before running the multiple regression, Pearson correlations were used to examine the relationship between the variables to ensure that the scales were appropriate to use in a regression. SIAS and MDI demonstrated a medium, positive correlation, $r = .54$, $n = 95$. GAS and SIAS demonstrated a medium, positive correlation, $r = .45$, $n = 97$. GAS and MDI also demonstrated a medium, positive correlation, $r = .50$, $n = 95$. The measures all demonstrated a medium correlation with each other and therefore were appropriate candidates for a multiple regression.

Standard multiple regression revealed that the combination of SIAS and MDI scores accounted for 30% of the variance, $R^2 = .3$, $F(2, 92) = 19.6$. These data suggests that a combination of social anxiety and depression can be considered significant predictors of severity of excessive gaming in excessive Internet Browser gamers.

When the independent variables were considered separately, depression scores made the most significant contribution to the model, $\beta = .37$, $t(92) = 3.54$, accounting for a unique 12% of the total variance. The other independent variable, social anxiety, made a lesser significant contribution to the mode, $\beta = .25$, $t(96) = 2.42$, accounting for an additional 4.5% of the variance in the model. These results support the prediction made in the hypothesis: depression is a significant predictor of excessive gaming scores among excessive Internet Browser gamers. Additionally, social anxiety demonstrates a lesser, yet significant, ability to predict excessive gaming scores among this population.

**Hypothesis 3**

Exploration of the third hypothesis was designed to reveal the influence of existing excessive gaming psychopathology on gamers who meet the criteria for excessive gaming, regardless of gaming medium. More specifically, total hours spent gaming, GAS scores, and

quality of life will be compared between excessive and non-excessive gamers. A score of at least 36 on the GAS coupled with an endorsement of at least one functional impairment criteria meant that the gamer met criteria for excessive gaming. The hypothesis states that excessive gamers should play significantly more hours, have significantly higher GAS scores, and report a significantly lower quality of life.

A between-groups MANOVA was performed to explore the differences in total gaming hours, GAS scores, and quality of life scores (as measured by the WHOQOL-BREF) between excessive and non-excessive gamers. All collected responses were included in the analysis with the exception of two total gaming hour scores that were physically impossible. All values are significant at $p < .05$ unless otherwise noted.

The MANOVA revealed a significant difference between excessive and non-excessive gamers across the combined dependent variables, $F(3,534) = 122.92$; $\Lambda = .59$; $\eta_p^2 = .41$. The results of the combined three dependent variables were significant, and therefore further exploration of the individual results for the dependent variables was warranted.

There was an individual main effect on quality of life, $F(1, 536) = 58.2$, $\eta_p^2 = .1$, among all respondents. An individual analysis of the quality of life scores revealed that excessive gamers reported significantly lower quality of life scores ($M = 38.72$, $SD = 6.69$) than non-excessive gamers ($M = 43.03$, $SD = 6.36$). These results support a portion of the third hypothesis that predicted excessive gamers would report experiencing lower qualities of life than non-excessive gamers.

There was also an individual main effect on excessive gaming (GAS) scores, $F(1, 536) = 350.83$, $\eta_p^2 = .4$, among all respondents. An individual analysis of the quality of life mean scores revealed that excessive gamers reported significantly higher GAS scores ($M = 52.28$, $SD =$

12.39) than non-excessive gamers ($M$ = 33.88, $SD$ = 10.37). These results support another portion of the third hypothesis that predicted gamers who met the combined criteria for excessive gaming would report significantly more severe excessive gaming habits.

A third, and final, main effect on total hours spent gaming in the last 30 days was revealed, $F(1, 536) = 9.05$, $\eta_p^2 = .02$, among all respondents. An individual analysis of the total hours spent gaming revealed that excessive gamers played significantly more hours ($M$ = 48.03, $SD$ = 66.06) than non-excessive gamers ($M$ = 32.73, $SD$ = 44.24). These results confirm the final prediction made in the hypothesis; excessive gamers play for more significantly more hours than non-excessive gamers. In summation, this hypothesis was wholly supported.

**Hypothesis 4**

The final hypothesis explored differences in reported social anxiety and depression among excessive gamers of different types. Each of the gaming media explored in the other hypotheses (MMORPG, Internet browser, online console) were included.

A between-groups MANOVA was performed using SIAS and MDI scores as the dependent variables and excessive/non-excessive gamer and gamer type as the independent variables. All values are significant at $p < .05$ unless otherwise noted.

The MANOVA revealed a significant difference between excessive and non-excessive gamers across the combined dependent variables, $F(2,364) = 23.35$; $\Lambda = .879$; $\eta_p^2 = .113$. Because the results of the combined three dependent variables were significant, further exploration of the individual results for the dependent variables was warranted.

An examination of the individual results revealed a significant difference on depression scores among excessive and non-excessive gamers, $F(1, 365) = 39.85$, $\eta_p^2 = .098$. An inspection of the mean scores indicated that excessive gamers reported higher levels of depression

($M$ = 15.66, $SD$ = 10.82) than non-excessive gamers ($M$ = 8.94, $SD$ = 10.06). These results support part of the hypothesis because they reveal that excessive gamers are experiencing significantly more depressive symptoms than non-excessive gamers.

An examination of the individual results revealed a significant difference on social anxiety scores among excessive and non-excessive gamers, $F(1, 365) = 30.61$, $\eta_p^2 = .077$. An inspection of the mean scores indicated that excessive gamers reported higher levels of social anxiety ($M$ = 19.04, $SD$ = 12.28) than non-excessive gamers ($M$ = 11.76, $SD$ = 10.77). These results support part of the hypothesis because they reveal that excessive gamers are experiencing significantly more social anxiety symptoms than non-excessive gamers.

The MANOVA revealed no significant differences across gamer types on the combined dependent variables SIAS and MDI, $F(4, 728) = 1.36$. However, an inspection of the individual variables revealed that differences in MDI scores across gamer type was approaching significance, $F(2,65) = 2.19$, $p = .11$. The follow-up ANOVA revealed that Internet Browser gamers had significantly higher scores on the MDI scales ($M$ = 14.28, $SE$ = 1.2) than MMORPG gamers ($M$ = 11.15, $SE$ = .93). Internet Browser gamers also approaching significance ($p$ = .19) in regard to having higher MDI scores than console gamers ($M$ = 12.35, $SE$ = .85). There were no significant differences among SIAS scores across gamer types. These results assist in partially supporting the hypothesis due to the revelation of Internet Browser gamers reporting the most depressive symptoms.

The MANOVA revealed no significant differences in the interaction of excessive/non-excessive gamers with gamer type on the combined dependent variables, $F(4, 728) = .722$. These findings suggest that there are no differences among excessive or non-excessive gamers across gamer types in regard to social anxiety or depressive scores. These results cannot support

the portions of the hypothesis that predicted significantly different SIAS and MDI scores among excessive gamers across gamer type. However, these results did reveal that excessive gamers also report significantly more depression and social anxiety than non-excessive gamers. In total, the mixture of significant and non-significant results across hypotheses creates an opportunity to discuss what was learned and what warrants exploration in future research.

## Discussion

There were three main goals of this study that were addressed by the sum of the four tested hypotheses. First, in order to more clearly define exactly how excessive gaming can be conceptualized and measured, a combination of several instruments and tools were used to provide a more complete definition of excessive online gaming. Second, additional factors, including social anxiety, depression, and quality of life were examined to attempt to establish evidence to support whether excessive gaming is best conceptualized as a separate psychological condition or a symptom of other pathology. Finally, differences in pathology across different kinds of online gamers were examined to see whether social anxiety or depression were more predictive of excessive gaming in any specific gaming medium. This section will begin with a synthesis of the implications of the results individually and as a whole and end with a discussion of the limitations of the study and future research directions.

The first hypothesis was designed to explore the relationship between the severity of social anxiety and depressive symptoms among MMORPG gamers. Because MMORPGs have a significant social component and previous research that has suggested that some MMORPG gamers may be using their gaming in order to get unmet real-world social needs met (Hussain & Griffiths, 2008), there was an expectation that social anxiety scores would be higher in excessive MMORPG gamers. However, the evidence from the results suggests that social anxiety is not a

strong predictor of excessive gaming severity. In fact, social anxiety did not make a significant individual contribution to the explanation of variance in excessive gaming scores. These results were nearly a reversal of the stated expectations in the hypothesis.

Depression scores were included in this hypothesis with the intention of highlighting the way different pathology may be better predictors of excessive gaming in MMORPG players. It was particularly surprising to find out that depression scores were actually a much stronger predictor than social anxiety for severity of excessive gaming among MMORPG gamers. These results support the claim that, although the combination of depression and social anxiety scores is a fairly strong predictor of excessive gaming behavior, depression is the most significant predictor of excessive gaming behavior.

In the second hypothesis, the ability of the same factors (social anxiety and depression) to predict excessive gaming scores among Internet browser gamers were examined through a multiple regression. Among these Internet browser gamers, social anxiety and depression were even stronger predictors of excessive gaming scores than in excessive MMORPG players. It was expected that depression would be a more significant predictor of excessive gaming behavior and in support of that hypothesis, depression scores accounted for nearly three times as much of the variance in excessive gaming scores than social anxiety.

This finding is in support of Seay and Kraut's (2007) assertion that gamers who are depressed have a diminished ability to self-regulate and therefore are vulnerable to slipping into excessive gaming habits. This occurrence may be explained by the "easy-in, easy-out" nature (Klimmt, Schmid, & Orthmann, 2009) of these games due to the fact that they naturally lend themselves to be "time killers." Because gamers living with depression are more likely to be less active, it makes sense that these gamers may be spending more time sitting at home casually

engaging in "easy-in, easy-out" games that require no lengthy time commitment and can be played in a more passive way than the other gaming media explored in this study. Internet browser gamers who are playing to excess may be isolating, less likely to engage in any productive activity (homework, sports practice, going out to social events), and may choose Internet browser games as an escape mechanism or time-passer because of the low level of time and energy commitment required to acquire some sense of accomplishment. This finding supports previous research that suggests that excessive Internet browser gamers may be using gaming as a coping strategy to manage a number of psychological issues (Klimmt et al., 2009).

However, unlike with MMORPG gamers, social anxiety scores were a significant predictor of excessive gaming severity among Internet browser gamers. This result was very surprising result, given that Internet browser gaming requires much less social interaction than MMORPGs. One potential explanation could be that the reduced requirement of social interaction to play Internet browser games in comparison to MMORPGs is naturally more appealing to those who have less desire for social interaction. The level of social interaction, even through a virtual medium, that is required for success in the MMORPG environment may actually seem unappealing to someone living with severe social anxiety. Another explanation may be that excessive Internet browser gamers who are feeling depressed are also feeling less desire to seek out or engage in social activities. In other words, if an excessive gamer is depressed, he or she may be experiencing a significantly reduced desire for social interaction and therefore present as somewhat socially avoidant, even if this is not usually the case for them.

The results of the third hypothesis revealed that excessive gamers are reporting more hours spent gaming, lower qualities of life, and more severe addiction-like symptoms related to

excessive gaming. These findings all supported the initial hypothesis and provided some revealing information in regard to the differences between excessive and non-excessive gamers.

Excessive gamers typically spend about 48 hours a month playing games compared to 33 hours for non-excessive gamers. This information would suggest that excessive gamers are often playing significantly more than non-excessive gamers and that this might be a worthy starter criterion to evaluate when considering how healthy someone's gaming habits are. Although this may seem fairly obvious because some may look to the amount of hours played as a main criterion for defining excessive gaming, it should be noted that there were a number of respondents who reported playing 48 hours or more in a month and did not meet excessive gaming criteria. These findings are in support of previous research stating that some gamers appear to be able to play upward of 50 hours a month and do not report suffering negative consequences (Lafrenière, Vallerand, Donahue, & Lavigne, 2009). Therefore, it is clear that time spent gaming is not a wholly sufficient criterion that can be used to evaluate whether or not someone is an excessive gamer and that a more holistic view is necessary.

Overall, quality of life scores are significantly lower among excessive gamers when compared to non-excessive gamers across gaming media. This finding means that excessive gamers reported significantly lower satisfaction with their health, sleep, personal relationships, financial security, and bodily appearance. These findings are also in support of several prior studies that demonstrated similar results (Li, Jackson, & Trees, 2008; Chappell et al., 2006) which makes sense, given that excessive gamers are endorsing more social anxiety, depression, and consequences of excessive gaming than non-excessive gamers. Someone who is not comfortable in social interactions, reporting a dysphoric mood, and has suffered personal, professional, or relationship consequences is likely to report a lower quality of life than someone

who has not. This finding supports the idea that excessive gamers are potentially living with a wide-range of psychological complaints and consequences. Again, whereas any attribution of causation should be avoided in this situation, it is clear that excessive gamers are often experiencing considerable problems in areas beyond their gaming habits. The revelation of excessive gaming habits is one clue that something is not working as desired in a person's life.

Another goal of this hypothesis was to expand upon and potentially improve the accuracy of correctly identifying excessive gaming behavior using psychological assessment instruments. A score of 36 on the GAS and at least one functional impairment in the gamer's personal, professional, or academic lives was required to meet criteria for excessive gaming The design of this hypothesis was purposeful in challenging the lack of emotional, physical, or emotional impairment that has previously not been required to meet various additions' criteria. As noted by Beard and Wolf (2001), if the word "gaming" was replaced with "your child" within the addiction criteria items on the GAS, the mother of a newborn would likely meet enough criteria that she may erroneously be labeled as addicted to her child. The addition of Beard and Wolf's functional impairment criteria was useful in establishing a more accurate picture of someone whose life is negatively impacted by these behaviors. It was predicted that the addition of a functional impairment criteria would more accurately identify those experiencing negative consequences due to gaming habits.

The results clearly demonstrated that excessive gamers who met these criteria scored significantly higher on the GAS than non-excessive gamers. Excessive gamers were significantly more likely to play longer than intended, lie about gaming habits, use gaming as a coping strategy, fell upset or angry when unable to play, and have unsuccessful attempts at quitting. Because time spent playing or thinking about gaming is not sufficient to identify

excessive gaming habits, it is clear that the inclusion of impairment criteria will provide clinicians with a more accurate understanding of the way a gamer's habits impact day-to-day life. This nuanced approach to assessing excessive gaming habits may provide more revealing information about the other areas of a gamer's life that may not be going as well as the gamer would like and assist the clinician in making a more thorough disposition assessment.

The fourth hypothesis examined differences in psychopathology between excessive and non-excessive gamers across the three examined gamer types (MMORPG, Internet browser, and online console). There was no evidence to support differences in gaming pathology across gamer type or due to the interaction of gamer type and excessive/non-excessive gamers. However, and potentially most importantly, there were significant results that revealed that, overall and regardless of gaming medium, excessive gamers endorsed nearly twice as many depressive and social anxiety symptoms as non-excessive gamers. This is the most striking result in terms of revealing a deeper psychological struggle than just poor management of gaming habits.

Within these results, a somewhat unexpected finding was the predictive strength of depression scores on the MDI in regard to excessive gaming severity, regardless of gaming medium. Comparatively, social anxiety was a much weaker predictor of excessive gaming behaviors in every hypothesis and did not appear to have much variation between gamer type, regardless of excessive or non-excessive gamer status. This finding may be explained by the stronger correlation between the MDI and GAS scales in comparison to the correlation between SIAS and GAS scales. Another explanation could be the fact that depressive symptoms tend to be more temporary and be more evident when someone is gaming to excess while social anxiety traits remain more constant, regardless of gaming habits. This result in particular is the strongest

indicator in suggesting that excessive gaming habits may be symptom or a part of larger psychological dysfunction – most notably depression. The combination of these results provides an opportunity to expand on the possible reasons for these findings.

Although it would be impossible to prove causation as it relates to psychopathology and excessive gaming behaviors, the results of the analyses do provide additional insight that continue moving toward finding actionable answers to the three questions that inspired this project. The first major question posed in this paper was whether there may be a more accurate way to conceptualize and assess excessive gaming habits. The variety of theories and proposed explanations for excessive gaming existing in literature were reviewed. More specifically, there was a challenge to examine whether or not the addition of functional impairment criteria to an existing conceptualization of gaming addiction would help differentiate between excessive and enthusiastic gamers. Prior to this study, there had not been an excessive gaming theory that focused on functional impairment. Frankly, it appears as though functional impairment is one of the only diagnostic items that can accurately differentiate excessive from enthusiastic gaming. It is now clear that clinicians should be asking about functional impairment when assessing excessive gaming habits as the addition of these criteria was successful in identifying severity of excessive gaming habits.

The second overarching goal of this project was to examine the psychopathology among excessive gamers across several gaming media. There was a mix of expected results and surprising findings. Social anxiety does not appear to play as strong of a role when it comes to predicting excessive gaming. The evidence with the results would suggest that social anxiety probably makes some contribution to excessive gaming, but it is certainly not the principle player. This finding goes against the stereotype of the nerdy shut-in who only plays games and

lacks either the skills or desire for social contact. As previously noted in the study by Chappell et al. (2006), gamer demographics are changing, and it appears even socially adept individuals may be vulnerable to excessive gaming problems under the right circumstances. As society evolves and technology takes up more space in our daily lives, it is important not to write-off or make assumptions about the role gaming may play in someone's life based on dated stereotypes that may have never actually been accurate in the first place.

If social anxiety was a surprisingly weak predictor of excessive gaming habits, then depression was an equally surprisingly strong predictor of excessive gaming habits. Consistently and across all media, depression appears to play a very influential role in the report of excessive gaming habits. Originally added to the study to serve as a comparison for how much more influential social anxiety levels would be, depression scores ended up being the most powerful predictor of excessive gaming. Excessive gamers appear to have moved beyond game playing as a healthy and passionate exercise and into a realm where gaming appears to be more of an escape, time-filler, or compulsion. It is not possible to speak to whether the excessive gaming habits came before the depression or vice versa in this study, but future studies may do well to explore that relationship in greater detail. Regardless, these results should provide clinicians with more evidence to explore depression symptoms when a client is describing some potentially excessive gaming habits.

The third question asked whether there were significant differences among excessive gamers across gaming media. Although there were some minor differences in demographics, it appears as though excessive gaming has more to do with individual pathology and circumstance rather than gaming media of choice. It was unexpected to find that there were essentially no

significant differences in combined social anxiety and depression scores among MMORPG, Internet browser, and online console gamers, regardless of excessive/non-excessive gamer status.

However, an exception to the generally similar psychopathology across media was that excessive Internet browser gamers are significantly more depressed than the other two. A comparison of mean MDI scores revealed that Internet browser gamers endorsed the most depressive symptoms, followed by console gamers and MMORPG gamers. This additional information suggests that those who identify as primarily Internet browser gamers may be at greater risk for a generally higher endorsement of depressive symptoms. It should be noted that the power of this effect in this study may be affected by the relatively small sample size for excessive Internet browser gamers ($n = 26$). Unfortunately, this is also a broad category of gamers who are engaging in gaming that does not require sustained and intentional attention like the other gaming media. Internet browser gamers may be playing while they browse the Internet, use social media, or chat, it's more difficult to attribute this spike to the gaming itself. It should be noted that the power of this effect in this study may be affected by the relatively small sample size for excessive Internet browser gamers ($n = 26$).

When examining these results, there are some important limitations to this study that need to be considered. First, the solicitation of respondents that included Marshall University undergraduates, Facebook members, and gamers who found the link by browsing one of several online gaming forums that were hosted at prominent gaming websites potentially limited the variety of respondents. Millions of people play MMORPGs (Wei et al., 2010) and, without directly sampling from gamers who are playing a game, there is a risk that the most excessive gamers or gamers living with the most social anxiety may avoid browsing those online gaming forums at all. Because of the avoidant behavior associated with social anxiety, this study may

not have reached the most excessive gamers whose responses could have significantly altered the results.

There are also some general limitations that accompany the use of a survey that has asks respondents to anonymously self-report and rate their own experiences and feelings. Because this was an anonymous survey, respondents did not have an opportunity to ask for clarification about questions they may not have understood, and that could influence responses. A number of the questions were about behavior or psychopathology that a respondent may or may not be fully aware of or comfortable acknowledging. Without the opportunity to meet each respondent, and due to the anonymous nature of the survey, there is always the possibility that a respondent may not respond honestly and accurately or that a respondent may exaggerate. If a respondent was feeling defensive about his or her potentially excessive gaming habits, defensiveness may have got in the way of full disclosure. Future research that can be accomplished through face-to-face interview or that includes third-party (parent, partner, teacher, etc.) report would assist in allaying some of these concerns.

A unique limitation to this study may be that, although the survey was completed by internationally represented respondents, the survey required an understanding of the English language. Excessive and problematic gaming behaviors have garnered considerable amount of attention in Asian countries where English is not the primary language. By not offering a multi-language version of the survey, any potential respondents who may have enriched the data from this region where effectively excluded. Future researchers would do well to explore the potential benefits of a multi-language survey in order to increase the likelihood of providing access to the survey to wider range of International respondents.

Another potential limitation may exist due to the lack of a previously stated cutoff score on the GAS in order that determined whether a gamer met criteria for excessive gaming (gaming addiction). The scale required a "yes" or "no" endorsement of enough symptoms to meet DSM-IV criteria for a behavioral addiction regardless of the severity of the item endorsed on the Likert scale. For the purpose of this study, a cutoff score of 36 on the GAS was used because that was the lowest score someone could achieve and endorse enough items to meet DSM-IV criteria. This score was coupled with the Beard and Wolf (2001) functional impairment criteria in an attempt to establish a more complete definition of excessive gaming. Although the analyses suggest that this is an effective way to establish excessive gaming criteria, these criteria will need to be further evaluated in future research to develop more support for this approach to conceptualizing excessive gaming.

Examination of the topics discussed in this dissertation can be expanded through future research in several ways. Similar research examining some of the same factors should be conducted using a less limiting sample in order to reach more gamers and expand the power of the study. It would be useful to compare some of these same psychological factors affecting excessive online and offline (single player) gamers. Additionally, a number of different PC genres were not included in this study (real-time strategy, first-person shooters, sports, racing, puzzle games, etc.) that may provide different results should they be included in the analyses. This study relied on anonymous, online, self-report data from respondents. Future researchers or clinicians may be interested in having respondents more accurately track their own gaming habits over a period of time, complete an in-depth clinical interview to gain more detailed information, solicit corroborating data from others about a respondent's gaming habits, or track

behavioral changes among excessive gamers over time to get a more accurate picture of the gaming habits and see how their mental and physical health changes during those periods.

One of the most important takeaways from this study is that excessive gamers clearly experience significantly more negative psychosocial consequences and lower qualities of life than non-excessive gamers. Although the results did not support any specific differences in pathology across excessive gamer types, there are now data to support the severity of depressive symptoms being a significant predictor of excessive gaming habits, lending some preliminary support to a new conceptualization of excessive online gaming as potentially being a symptom of other pathology rather than its own disorder. Excessive online gamers report more social anxiety than non-excessive online gamers, but it appears that social anxiety is not a significant predictor of excessive gaming among any specific type of online gamer. These results should encourage clinicians to ask questions about social anxiety, depression, or quality of life in order to obtain a more complete picture about a client who they believe may be gaming to excess.

In summary, it is clear that excessive gamers are at risk for experiencing a wide range of negative psychosocial consequences that include depression, social anxiety, physical health problems, relationship struggles, financial strain, and unsatisfying sleep habits. It does not appear to matter what kind of online gaming medium is primary to the gamer, these psychosocial consequences appear to be more of a function of the excessive gaming behaviors rather than being influenced by the mechanics of any specific gaming medium. Because excessive gamers reported a variety of quality of life complaints, a thorough assessment that takes a holistic approach may yield stronger results than trying to simply modify gaming habits. Gamers who meet criteria for excessive gaming do not typically report being troubled by their gaming – rather they are troubled by the life outside of their gaming. If gaming has become the only effective,

yet problematic, coping strategy that a person has found to manage an unsatisfying life, then altering or reducing the amount of time spent gaming without addressing other underlying emotional, physical, professional, or academic issues will most likely not be a recipe for life success.

It is likely that, as generations are exposed and connected to technology and video gaming at younger ages, clinicians would be well served to start considering gaming to be a widely accepted hobby adopted by people of all ages, race, gender, and class that can be equivalent to playing sports, learning an instrument, scrapbooking, or any other more socially acceptable hobby. A clinician who understands that all of these hobbies are equally harmless in moderation but disruptive in excess will focus on a more complete assessment of the individual rather than being overly focused on a particular behavior that may seem out of the ordinary or undesirable to the clinician. Working within this framework will best facilitate the establishment of effective treatment goals for someone who may or may not realize that excessive gaming is a piece of his or her life struggle.

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**Office of Research Integrity**
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205
IRB2 #00003206

January 19, 2012

Keith Beard, PsyD
Psychology Department

RE: IRBNet ID# 214934-2
**At**: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Beard:

| | |
|---|---|
| **Protocol Title:** | [214934-2] Examining Social Anxiety and Depression Among Excessive Online Gamers |
| **Expiration Date:** | February 2, 2013 |
| **Site Location:** | MU |
| **Submission Type:** | Continuing Review/Progress Report APPROVED |
| **Review Type:** | Exempt Review |

The above study and informed consent were approved for an additional 12 months by the Marshall University Institutional Review Board #2 (Social/Behavioral) Designee. The approval will expire February 2, 2013. Since this approval is within 30 days of the expiration date, the fixed anniversary date of 02/02 was maintained. Continuing review materials should be submitted no later than 30 days prior to the expiration date.

This study is for student Nathan Sharer.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral/Educational) Coordinator Michelle Woomer, B.A., M.S at (304) 696-4308 or woomer3@marshall.edu. Please include your study title and reference number in all correspondence with this office.

# Nathan Sharer, Ed.S.
# Curriculum Vitae

## EDUCATION

07/09 – 08/12 **MARSHALL UNIVERSITY** Huntington, WV
*Candidate for Psy.D., Clinical Psychology (APA Accredited)*
- GPA: 4.0
- Dissertation: *Examining Social Anxiety and Depression Among Excessive Online Gamers* (Chairperson: Keith Beard, Psy.D.)

08/06 – 05/09 **JAMES MADISON UNIVERSITY** Harrisonburg, VA
*Education Specialist and Master of Arts, Community Counseling*
- GPA: 4.0
- Ed.S. research project: *Online Gaming: Examining Psychological Outcomes and Conceptualizing Excessive Use* (Chairperson: Lennie Echterling, Ph.D.).

01/04 – 05/06 **SHIPPENSBURG UNIVERSITY** Shippensburg, PA
*Bachelor of Arts, Psychology*
- Graduated Magna Cum Laude, Senior Outstanding Grade Point Average award, Dean's list 2004-2006
- Undergraduate Psychology Research: *Comparing Approach Versus Avoidance Goals in College Freshmen* (Faculty Mentor: Kim Weikel, Ph.D.).

## PROFESSIONAL EXPERIENCE

**TOWSON UNIVERSITY COUNSELING CENTER** Towson, MD
07/11 – Current ***Doctoral Intern*** *(40-45 hrs/wk)*
*APA Accredited Pre-Doctoral Internship*
- Provide brief, solution-focused individual therapy for 12-14 Towson University student clients per week
- Conduct 4 weekly intake assessments and make referral/treatment decisions
- Conduct weekly relationships process group for 8-10 students in fall and spring semesters
- Provide suicide prevention, drug and alcohol education, and general mental health outreach programming to students in residence life, athletics, and the veterans' center
- Provide 4 hours of emergency walk-in coverage during the week and several weekends of after hours on-call support
- Regularly attend Intern Seminars exploring a variety of developing psychologist issues
- Apprentice the Training Director (Dr. Mollie Herman) by participating in the intern selection committee, reviewing APA accreditation report, completing research on national licensure laws, and exploring training procedures and evaluation
- Will provide supervision to a Doctoral Extern during the 2012 spring semester

- Supervisors: Cathy Sullivan-Windt Ph.D.; Mollie Herman, Ph.D.

**PRESTONSBURG VA COMMUNITY-BASED OUTPATIENT CLINIC** Prestonsburg, KY

08/10 – 05/11 ***Psychology Student*** *(8 hrs/wk)*

*Rural Practicum in Clinical Psychology*

- Provided individual therapy for a caseload of 5-7 veterans
- Conducted 1-2 weekly intake assessments and psychological consults
- Supervisors: Roslyn Feierstein, Ph.D., A.B.P.P; Clifton Hudson, Ph.D., A.B.P.P.

**HUNTINGTON VETERANS AFFAIRS MEDICAL CENTER** Huntington, WV

06/10 – 05/11 ***Psychology Student*** *(10-15 hrs/wk)*

*Advanced Practicum in Clinical Psychology*

- Provided individual therapy for a caseload of 5-7 veterans presenting with PTSD and general mental health concerns
- As a member of the PTSD Clinical Team (PCT), provided 1-2 weekly intake assessments and present cases for treatment planning at the weekly PCT staffing meeting
- Co-lead a weekly Anger Management group as lead therapist with a group of 8 veterans
- Administered psychodiagnostic and neuropsychological assessments, prepared integrated reports, provided feedback on results
- Completed psychological assessment and screenings for veterans interested in spinal cord stimulator, morphine pump, and bariatric weight loss surgeries
- Supervisors: Roslyn Feierstein, Ph.D., A.B.P.P; Clifton Hudson, Ph.D., A.B.P.P.

**MARSHALL UNIVERSITY** Huntington, WV

01/10 – 05/10 ***Student Therapist,*** *Marshall Student Development Center (20 hrs/wk)*

*Advanced Practicum in Clinical Psychology*

- Provided brief individual therapy to a caseload of 12 - 15 Marshall University students
- Completed 1-3 weekly intake assessments
- Administered BASICS alcohol assessments and provided therapy to students who violated Marshall's substance abuse policies
- Provided emergency walk-in coverage as needed
- Developed and presented a student-veteran sensitivity workshop aimed at training university-wide staff and faculty
- Assisted in the development of a student-veteran academic transitions group
- Supervisors: Carla Lapelle, M.A., Associate Dean of Student Affairs; Marty Amerikaner, Ph.D.

09/09 – 03/10 ***Student Clinician,*** *Marshall University Psychology Clinic (10 hrs/wk)*

*Practicum in Clinical Psychology*

- Provided brief individual therapy to 5 – 7 clients, including Marshall University students as well as adults and children within the Huntington community
- Conducted adult and child assessments in regard to learning disabilities and ADHD

- Consulted with several head start classroom instructors in the Huntington area to improve classroom functioning
- Supervisors: Marty Amerikaner, Ph.D.; Dr. Marianna Linz, Ph.D.

**JAMES MADISON UNIVERSITY** Harrisonburg, VA

08/08 – 05/09 ***Counseling Extern****, Counseling and Student Development Center* (30-35 hrs/wk)

*Ed.S. Internship*

- Provided brief, solution-focused therapy to a caseload of 10-12 undergraduate clients and completed 1-3 weekly intake assessments
- Co-facilitated two general process groups with 4-7 undergraduate clients in each
- Completed BASICS sessions with students referred from Judicial Affairs
- Represented the CSDC by facilitating the discussion/processing portion of the "House of Privilege" interdepartmental privilege awareness program
- Conducted outreach with campus organizations
- Participated in bi-weekly clinical training opportunities
- Supervisors: Shirley Cobb, M.A., Associate Director and Clinical Director; Tom Metzinger, M.Ed., LPC

01/08 – 05/08 ***Counseling Student****, Counseling and Student Development Center (10 hrs/wk)*

*Community Counseling Practicum*

- Provided brief individual therapy while managing a caseload of 3-5 undergraduate clients
- Served as a process observer during a general process group facilitated by senior staff
- Supervisors: Mercy Souder, M.A.; Tom Metzinger, M.A., LPC

01/02 – 05/06 **OCCUPATIONAL SERVICES INC.** Chambersburg, PA

***Job Coach*** (20-25 hours/week)

- Instructed, supervised, and assisted clients living with developmental disabilities or severe mental illness who were attempting to obtain competitive employment in the community
- Created, implemented, and supported site-specific training and behavioral programs for a caseload of 10 - 20 clients
- Supervisor: Linda Mayo, Director of Client Services

## UNIVERSITY WORK EXPERIENCE

**MARSHALL UNIVERSITY**

Huntington,WV

08/10 – 05/11 ***Graduate Assistant****, Psychology Department Website (10 hrs/wk)*

Designed, developed, and managed content for the Psychology Department website

08/09 – 05/11 ***Assistant to the Editor**, Journal of Rural Community Psychology*
Assisted in the online publication of the *Journal of Rural Community Psychology* published by Marshall University

08/09 – 05/10 ***Graduate Assistant**, Psychology Department (20 hrs/wk)*
- Provided general departmental support as needed including staffing the welcome desk, running errands, making copies, and assisting undergraduates as needed
- Assisted psychology professors with research, test grading, and troubleshooting technology issues occurring in the psychology department

08/06 – 05/08 **JAMES MADISON UNIVERSITY**
Harrisonburg, VA ***Graduate Assistant**, Learning, Technology, and Leadership Education (20 hrs/wk)*
- Served as an assistant to the program coordinator for the Educational Leadership program
- Managed departmental information technology troubleshooting
- Assisted departmental faculty by screening applicants, developing coursework, conducting research and grading for a variety of education major classes

## CONSULTING EXPERIENCE

02/08 – 05/08 **OCCUPATIONAL SERVICES INC.**
Chambersburg, PA Workshop Series: *Improving Client Services by Enhancing Inter-Office Communication*
- Facilitated meetings between administrators, staff counselors, and job coaches as means to build cohesiveness and improve information sharing regarding client behavioral programs, medications, special training needs, and more thorough understandings of physical and mental disabilities
- Assisted in the creation and implementation of a client file system that compiled strengths, behavior program details, potential challenges, medication history, and a log to document any currently pertinent issues that could be utilized by job coaches and staff counselors

## PROFESSIONAL MEMBERSHIPS

- American Psychological Association, student affiliate (2010-current)
- American Counseling Association, member (2006-2009)
- Virginia Counselors Association, member (2007-2009)
- Phi Sigma Pi, National Honors Fraternity, Shippensburg University (2004-2006), Scholarship Chair (2006), Alumni Consultant (2006 – Present)

## PRESENTATIONS AND PUBLICATIONS

- "Assisting Veterans Transitioning into Higher Education"
  Huntington, WV
  Marshall University Staff and Faculty Workshop (February 2010)
- "Avoiding Freshman Pitfalls: Improving Time Management and Study Habits"
  Huntington, WV
  Marshall University UNI 101 (September 2009)
- "Virtually Satisfied: Emotional Consequences of Online Gaming"
  Harrisonburg, VA
  JMU Graduate Psychology Symposium (April 2009)
- "Developmental Disability and Stigma"
  Harrisonburg, VA
  Guest Lecture – Dr. Kate Loomis, Psy.D.'s Developmental
  Psychology Course at James Madison University (March 2009)
- "Comparing Approach Versus Avoidance Goals in College Freshman"
  Shippensburg, PA
  Shippensburg University Psychology Undergraduate Research Fair (April 2006)
- Sharer, N. (2009). ABA delivered through the web. *Behavior Analysis Digest International*, *21*(4), 1.

## REFERENCES

- Cathy Sullivan-Windt, Ph.D., Staff Psychologist, Towson University Counseling Center, Towson, MD.
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- Roslyn Feierstein, Ph.D., A.B.P.P., Staff Psychologist, Huntington VAMC, Huntington, WV.
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