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An examination of correlates of video game and Internet addiction

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A dissertation

entitled

An Examination of Correlates of Video Game

and Internet Addiction

by

Evan S. McBroom, M.A.

Submitted to the Graduate Faculty as partial fulfillment of the requirements for

the Doctoral of Philosophy Degree in Psychology

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The University Of Toledo

May 2013

An Abstract of

An Examination of Correlates of Video Game
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Within the field of addiction, there is a growing body of research surrounding the
phenomenon of electronic media addiction. Internet addiction has a growing research
base, and evidence is emerging that video game addiction may also be a diagnosable
disorder. Many believe that research justifies the use of criteria modified from
pathological gambling (also a type of behavioral addiction) to examine problematic video
game play. The goal of the current study was to identify correlates of addiction to
electronic media. Two studies were conducted. In Study 1, adults completed
questionnaires assessing background information, video game habits, game engagement,
and symptoms of video game and Internet addiction. In Study 2 parent/child dyads
completed modified versions of the same measures. Responses indicated that males
typically play more hours than females, are more likely to play video games online, and
experience greater game engagement. Females had higher scores on the Internet
addiction measure, and female gender emerged with online game play as a predictor of
Internet addiction, however the sample may overrepresent female gamers. Parents tended
to agree with their child on the genre of their child's favorite game, symptoms of Internet

addiction, and game engagement. Disagreement was most prominent for hours spent

playing video games and symptoms of video game addiction. Overall, present results

support continued work to understand excessive Internet use and video game play.

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I would like to begin by thanking my advisor, Dr. Jeanne Brockmyer, whose continued patience (even after six years) and guidance made it possible for me to produce the work presented in this text. Dr. Brockmyer's work in the area of video games has inspired this research and her direction as a supervisor has helped me to create lasting changes in the children I see in therapy. I could not ask for a better professional role model. I would also like to thank my committee members, Dr. Michele Knox, Dr. Karen Dill-Shackleford, Dr. Wesley Bullock, and Dr. Yueh-Ting Lee. Your ideas, comments, and revisions have helped me to complete this project and ultimately it is you as a group who help me achieve my doctorate. I want to thank my girlfriend, Tiffany Avon. She was not with me at the beginning of this process, but I am so happy she is with me at the end. She loved and supported me enough to cope with my anxiety and stress as I worked to finish my dissertation and I promise that it will be returned to you a million times over. Last, I would like to thank my family, Kate, Claire, Kim, and Sherwood. My family has been there for me my entire life and helped me to become the person and professional I am today. I am thankful for everything they have done for me and I know that they are proud I am achieving my doctoral degree. Also, if my parents had not bought me that Nintendo Entertainment System when I was 7-years-old who knows if I would even be in this position today.

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Chapter One

Introduction

The movie *Fight Club* offers a poignant view of modern culture with respect to the importance of technology and our related dependence. Brad Pitt's character, Tyler Durden, suggests that, throughout history, members of any given culture always find some way to anesthetize themselves, even if it is something as simple as smashing their heads against a rock. The point is that, through this behavior, individuals are able to achieve a goal, whether it be to help with sleep or to just forget about their troubles. If smashing one's head against a rock served that specific purpose, then it was likely repeated, but not without cost. Over time, an individual builds tolerance for the behavior and greater repetition is needed to achieve the same result; this can lead to addiction. Addictive behaviors may help the individual to temporarily suppress awareness of their problems and the accompanying distress. However, the long-term effects of addiction have extreme negative impact on individuals, families, and the broader society.

Addiction has surfaced as one of the major public health concerns of the 20th century, and there are many forms. Alcohol and drug addiction represent the biggest concern within the addiction area of substance abuse. A large national survey conducted by Hasin, Stinson, Ogburn, and Grant (2007) revealed that the lifetime prevalence of alcoholism in the United States population is 17.8%. Examining this statistic more closely, only about 24.7% of those who suffered from alcoholism were actually treated. In addition, there was high comorbidity with other substance abuse disorders (Hasin et

al., 2007). In a more recent study conducted by the World Health Organization (WHO), approximately 76.3 million people suffer from alcohol-related disorders and 15.3 million people have drug use disorders worldwide (WHO, 2009).

These numbers are upsetting, especially when one considers the toll that this behavior will typically take on families and society. Alcohol and other forms of substance abuse are related to many critical societal issues including but not limited to physical illness, crime, violence, homelessness, abuse, mental illness, and politics (Fals-Stewart, 2005). For example, the Centers for Disease Control and Prevention (CDC; 2012) indicated that there are around 80,000 deaths each year due to alcohol abuse, making alcoholism the third major cause of death in the U.S. In addition, the lifespan of individuals suffering from alcoholism was, on average, 12 years shorter than healthier individuals due to complications related to liver disease. Clearly, addiction has a tremendous impact on many facets of our life and as societies and technology advance, new sources of addictive behavior emerge.

Substance abuse is paradigmatic for addiction; however, the face of addiction has been steadily changing. John Hatterer (1982) first recognized that addiction involves behaviors beyond substance abuse. Hatterer (1982) proposed that the term addiction could apply to practically any substance, activity, or interaction in addition to alcohol and drugs. The activities or interactions could include, but are not limited to, food, smoking, gambling, purchasing, work, play, and sex. According to Hatterer (1982), agents (e.g. peers, family, media, etc.) in society could be instrumental in the progression of this addictive process. For example, society stresses the importance of peer groups, but gaining inclusion into peer groups can involve behaviors that encourage addictive

processes. Socioeconomic factors, such as failure to achieve a prescribed status or rapid

shifts upward or downward in status, can cause members of a culture to adopt an

addictive lifestyle or become involved with addictive subcultures. The media also

contributes to the addictive process by promoting addictive behaviors as the best way to

cope with pain, stress, conflict, pressure, and to attain success (Hatterer, 1982).

Since Hatterer's description, the face of addiction in U. S. society has been further

altered with the advent of "new media." New media is a broad term, according to

researchers such as Lister, Dovey, Giddings, Grant, and Kelly (2003), that reflects the

variety of technology. The definition of new media also includes new textual experiences

(e.g. better graphics in video games, special effects in movies, etc.), new ways of

representing the world, new relationships between consumers and technology, new

experiences of the relationship between embodiment, identity, and community, new

conceptions of the biological body's relationship to technological media, new patterns in

organization and production, computer mediated communications, new forms of media

consumption, virtual reality, and transformations of established media (Lister et al.,

2003).

More recently, Sussman and Sussman (2011) provided an updated definition of

addiction that could include behaviors associated with new media, as well as with more

traditionally recognized sources of addiction:

> A series of complex, associated behaviors may be engaged in to continue to
> achieve appetitive effects. The problem with continued engagement in addictive-
> related behaviors is that over time they lead to negative side effects. The "addict"
> may then try to figure out new behaviors to achieve similar appetitive effects,
> while trying to avoid negative results. Over time, negative consequences may be
> greater than the positive consequences of engaging in any number of addictive

behaviors. However, the participant may continue to engage in the behavior for several reasons. These reasons may include considering the behavior as a compromise between aspects of daily experience about which the participant feels a lack of control or accomplishment and aspects of experience the participant can manipulate. The behavior may be of a sort the participant can engage in relatively easily, and may still serve as a "short cut" to obtaining affective goals. The behavior may become a lifestyle, a means of existence. The stance the participant may take depends in part on the other activities about which the participant has access, or involvement. In the midst of the engagement in the addictive behavior, other competing behaviors may or may not be of interest unless woven into the fabric of the addictive behavior. (p. 4031)

The Internet and video games represent two types of "new media" that deserve closer examination with regard to potential for addiction. According to Miniwatts Marketing Group (2012), there are approximately 2.4 billion Internet users worldwide. Smith (2011) reported on Nielsen statistics about Internet usage, noting that over 50% of Americans use the Internet every day and that of this amount, 45% use email, 40% use search engines, 15% use social networking, and approximately 5% play online games over the Internet. Americans spend an average of 60 hours per month online (Smith, 2011). Statistics for Internet usage by age reported by the Pew Internet and American Life Project (2012) revealed that 95% of teens ages 12 through 17 use the Internet, followed by 94% of adults 18-29, 89% of adults aged 30-49, 77% of adults aged 50-64, and 54% of adults aged 65 and older. According to the Online Gaming Association (OGA; 2012) web site, in 2009 there were over 20 million online game players for Xbox 360 and 40 million registered PlayStation 3 Network accounts.

Video game sales remain incredibly strong. For example, in 2012 *Halo 4* sales reached $220 million on opening day, which was a new record for the franchise, even though it was only sold on the Xbox 360 system (Nayak, 2012). The record for first day sales set by *Grand Theft Auto IV* in 2008 has since been broken by *Call of Duty: Black*

Ops 2 in 2012, which surpassed $500 million (Kubba, 2012). For many, playing video games is an important regular source of leisure time entertainment. Playing can be a way to satisfy competitive urges, enjoy spectacular graphics, or revel in an intricate storyline. However, in some situations, playing video games can have grave negative consequences on an individual's life. For example, it was reported that a 27-year-old man in Taiwan collapsed and died in an Internet café after playing video games for 32 hours without a break (Parker, 2002). More recently, a teenager in Ohio who was said to be "dangerously addicted" to video games was convicted of murder after shooting his mother and father because the mother took away his copy of *Halo 3*, a very violent video game (McCarthy, 2009). These are extreme and rare examples, but they confirm the importance of studying and understanding the phenomenon of intense commitment to gaming.

Within the areas of Internet addiction, video game addiction, and online game play, past research has assumed, and to some extent established, that males are predominantly the primary consumers of video games (Griffiths, Davies, & Chappell, 2004; Cole & Griffiths, 2007; Smyth, 2008; Desai, Krishnan-Sarin, Cavallo, & Potenza, 2010). This is a trend that may be changing as the OGA (2012) reported that, among a sample of online game players, 58% were male and 42% were female. Player gender will be considered in researching addiction to the Internet and to electronic media.

In this dissertation, the past literature on addiction, pathological Internet use and video game play, and related topics will first be examined. Second, the proposed hypotheses will be presented. Third, the methodology of the study will be reviewed, including a discussion of participants, procedures, and measures. Fourth, the results of

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the study and statistical analyses will be processed. Finally, a discussion of the results

and their importance will be explained.

Chapter Two

Review of the Literature

Defining Addictive Behavior

Since this project focuses on addiction, it is important to clearly define the term.

For many, this term has simply been used to define something that is done in excess, but

its clinical meaning is much more significant. One broad definition (Fals-Stewart, 2005)

that defines all types of addiction is frequently cited:

> Addiction is viewed as a complex, progressive behavior pattern having biological,
> psychological, and sociological components. What distinguishes this pattern of
> behavior from others is the individual's overwhelming pathological involvement
> in or attachment to it, subjective compulsion to continue it, and reduced ability to
> exert control over it. The pattern continues despite its negative impact on the
> physical, psychological, and social functioning of the individual. (p. 303)

Based on this definition, it is clear that addiction and addictive behavior go beyond

something that is simply done to excess. There must be a distinct impact on the

functioning of the individual in multiple aspects of their life.

As mentioned earlier, there are many different types of addiction. More common

types of addiction include abuse or dependence on alcohol and illicit substances.

However, behaviors such as sex, eating, and gambling also may meet criteria for

addiction. Potenza (2006) argues that pathological gambling and impulse control

disorders bear many similarities to substance use disorders and suggests that these

addictions should be grouped in the same category. Potenza (2006) proposed that

increasing research in areas such as assessment and categorization of impulse control

disorders, more research with special populations, and more insight into the neurological effects of these disorders will make the case for similarities between behavioral addictions and substance use disorders even stronger. Two areas of behavioral addiction that are developing an increasingly larger research base are Internet usage and video game play, both of which are key to the present study.

Addiction to the Internet

It must be acknowledged that Internet addiction is not yet a diagnosable disorder according to the diagnostic manual, though it was considered for inclusion in the DSM-V (Block, 2008; Young, 2009).   Some researchers believe that the very idea of addiction to the Internet is flawed and that Internet addiction will never be a diagnosable disorder. Collier (2009) argues that because of disagreement about even a working definition, researchers should not move forward until definitional consensus has been reached. Bell (2007) argues that excessive Internet usage represents a compulsion to cover up underlying mental health problems, which is why Internet addiction should not be considered a unique psychological disorder. As this controversy continues, research into Internet addiction is moving forward. Among its many functions, the Internet serves as a medium for video game play. As with video games, there have been enormous technological advances in the past decade related to how the Internet is used.

Kimberly Young was one of the first researchers to move beyond anecdotal reports and case studies to demonstrate that Internet addiction may be a true clinical disorder. Young (1996) compared case studies of 396 "dependent" Internet users to 100 "non-dependent" Internet users. Using criteria for pathological gambling, Internet addiction was conceptualized as an impulse control disorder. These criteria were

modified to develop a questionnaire to identify addictive Internet use, the Internet

Addiction Test (IAT; Young, 1996). This instrument assesses whether or not people feel

preoccupied with the Internet, need increasing amounts of time on the Internet to achieve

satisfaction, are unsuccessful in attempts to control Internet use, experience symptoms

such as moodiness or agitation when cutting back on or stopping use, stay on-line longer

than intended, experience occupational or social impairment as a result of use, lie to

others about Internet use, and use the Internet as an escape from problems. Answering

"yes" to five or more statements was considered indicative of dependent Internet use.

Young demonstrated that dependent and non-dependent Internet users differed

significantly on the amount of time spent on the Internet, 38.5 hours and 4.9 hours

respectively (Young, 1996). Dependent Internet users were much more likely to spend

the majority of their online time in chat rooms and Multi-User Dungeons (MUDs) (online

games in which players can interact remotely with other players). Dependent Internet

users also had significantly more problems (e.g. academic, occupational, relationship,

financial, and physical) associated with their excessive Internet use than non-dependent

users (Young, 1996). This study was important not only because it showed that Internet

addiction shares characteristics of other diagnosable disorders, but that there may also be

significant overlap between Internet addiction and pathological video game play as

evidenced by the number of dependent Internet users who spend time in MUDs.

Beard (2005) identified several other questionnaires to measure Internet addiction,

in addition to Young's Internet Addiction Test (1996). The questionnaires include the

following: Generalized Problematic Internet Use Scale (GPIUS), Online Cognition Scale

(OCS), and the Internet-Related Addictive Behavior Inventory (IRABI). Of these

measures, the IAT was found to be the most reliable in measuring addictive behavior on the Internet. Beard also developed a clinical interview to address such topics as the presenting problem, biological factors, psychological and social issues, and relapse prevention. Beard raised concern that individuals who present to therapy for Internet addiction may not be taken seriously and that mental health providers need to be aware of the seriousness of this problem.

Factors influencing Internet addiction. Several studies have attempted to identify characteristics or behaviors that might predispose an individual to excessive Internet use. There are countless ways to interact with others online, including video games, chat rooms, blogs, and social networking sites. It has been proposed that social withdrawal or shyness could play an important role in the development of Internet addiction. Yuen and Lavin (2004) examined interpersonal shyness in a sample of 283 college students in both face-to-face (FTF) and online interactions. All participants completed a questionnaire assessing shyness in the two settings. Participants were separated into dependent and non-dependent Internet users based on responses to a 7-item questionnaire the authors adapted from criteria for addiction in the DSM-IV-TR and modified for Internet dependency. Lower levels of shyness were reported for dependent Internet users strictly in an online setting, while non-dependent Internet users appeared more comfortable in an FTF setting (Yuen & Lavin, 2004). These findings indicate that, in this sample and based on self-report, individuals dependent on the Internet feel more comfortable interacting with others online than face-to-face. Another study examined the relationship between shyness, locus of control, and Internet addiction in a sample of 722 participants between the ages of 12 to 26 years (Chak & Leung, 2004). Shyness was

moderately, but positively, associated with Internet addiction. In this study, individuals who reported being more shy were more likely to endorse being addicted to the Internet (Chak & Leung, 2004). Taken together, these studies suggest that the Internet could provide a safe medium for socialization for shy or socially withdrawn individuals because interactions via the Internet do not require face-to-face interaction. However, there is also the possibility that excessive Internet use could lead to social isolation.

Young and Rogers (1998) examined relationships between depression, self-esteem and Internet addiction. These authors surveyed 312 participants using questionnaires that assessed Internet addiction and symptoms of depression, including low self-esteem, poor motivation, fear of rejection, and the need for approval. It was hypothesized that people with higher depression would use the Internet to engage in pleasure-seeking activities, and to ameliorate symptoms of depression. Symptoms of depression were positively associated with Internet addiction. Upon closer examination, it was found specifically that low self-esteem, poor motivation, fear of rejection, and the need for approval were associated with Internet addiction. Although a causal relationship could not be established, the authors proposed that increased amounts of time online could lead to an increase in social isolation, which then may lead to increased levels of depression (Young & Rogers, 1998). Niemz, Griffiths, and Banyard (2005) surveyed 371 British students, assessing Internet addiction, self-esteem, and other characteristics. Participants who scored higher on an Internet addiction questionnaire had lower self-esteem and spent more time online than those who did not meet criteria for being at risk for Internet addiction.

Some studies suggest that the college student population may be at increased risk of developing Internet addiction. Morahan-Martin and Shumacher (2000) classified students as dependent or non-dependent on the Internet based on whether or not the participants answered "Yes" to four or more items on a questionnaire measuring pathological Internet use. They then compared the Internet usage of these two groups. Results indicated that 8.1% of the sample could be classified as dependent; these participants spent an average of 8.48 hours per week online. Non-dependent users spent 3.45 hours per week online (Morahan-Martin & Shumacher, 2000). Young (2003) reviewed research on college students and Internet addiction. Her review indicated that college students may be more susceptible to dependent use of the Internet than the general population due to having free and unlimited Internet access, more unstructured time, freedom from parental control, no monitoring of online activity, desire to escape college stressors, and social alienation, among others (Young, 2003). It does appear that college students may have heightened risk for addictive behavior on the Internet.

Research is beginning to emerge that examines whether or not individuals who exhibit symptoms of Internet addiction have alterations in brain functioning. Hou et al. (2012) reviewed brain scans of participants who self-identified as experiencing significant symptoms of Internet addiction. Scans showed decreased striatal dopamine transporters (DAT) in a small sample of individuals with dependent Internet use compared to healthy individuals. This finding is significant because it suggests that Internet addiction may actually damage the neurological pathways that promote the release of dopamine (Hou et al., 2012). With decreased dopamine release, the sense of

reward or euphoria is more difficult to achieve and more of the behavior is needed to gain this same result.

It is important to recognize that the phenomenon of Internet addiction is recognized to the extent that there are clinics opening worldwide that specialize in the treatment of this addiction. For example, one Seattle-based clinic offers a 45-day recovery program using a 12-step approach to recovery (Cash, 2009). In fact, Internet addiction clinics had already been established in South Korea before appearing in the United States. Fackler (2007) chronicled the opening of Jump Up Internet Rescue School, a clinic in South Korea that embraced a boot camp approach to curing Internet addiction. With a population of mostly adolescent males, this clinic kept individuals away from the Internet by denying usage and subjecting them to rigorous physical activity and chores. The existence of clinics that address Internet addiction is further indication that this is a real phenomenon worthy of research attention.

Video Game Addiction

Playing video games is one of the most popular Internet activities. Therefore it is reasonable to consider whether a pathological degree of video game play could contribute to addiction to the Internet. Similar to Internet addiction, there is debate in the literature as to whether or not the phenomenon known as video game addiction is real (Shaffer, Hall, & Vander Bilt, 2000; Shaffer & Kidman, 2003). Some researchers examining pathological levels of video game play believe that this behavior falls within the realm of impulse control disorders (Salguero & Moran, 2002; Gentile, 2009). Applying revised criteria from one impulse control disorder, pathological gambling, researchers have begun to study a possible diagnosis of addiction to video game play.

According to the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition – Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000), an individual can be diagnosed with pathological gambling if they meet 5 or more of the 10 possible criteria. These criteria include:

- Being preoccupied with gambling

- Needing to gamble with increasing amounts of money in order to achieve the desired excitement

- Had repeated unsuccessful efforts to control, cut back, or stop gambling

- Is restless or irritable when attempting to cut down or stop gambling

- Gambles as a way of escaping from problems or of relieving dysphoric mood

- After losing money gambling, often returns another day to get even

- Lies to others to conceal the extent of involvement with gambling

- Has committed illegal acts to finance gambling

- Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling

- Relies on others to provide money to relieve a desperate financial situation caused by gambling (p. 674)

Individuals who play video games excessively may exhibit many similar symptoms that reflect cognitive preoccupation, tolerance, withdrawal, a sense of euphoria or change in mood, behavioral changes, conflict in various areas on life, and relapse (DSM-IV-TR; American Psychiatric Association, 2000). It does appear that the DSM-

IV-TR criteria for pathological gambling provide an excellent base to describe the symptoms of pathological video game play. Research further suggests that there are similarities between the characteristics of video games and some forms of gambling. Griffiths and Wood (2000) examined gambling, video games, and Internet habits among adolescents. The authors identify a relationship indicating that pathological Internet users are more likely to play interactive video games online. This further supports the possibility that addiction to the Internet may be driven, at least in part, by compulsive game-play. Another interesting aspect of this research was that the authors found a set of seven characteristics that slot machines share with arcade video games. These characteristics include:

- The requirement of response to stimuli, which are predictable and governed by the software loop.
- The requirement of total concentration and good hand-eye coordination.
- Rapid span of play negotiable to some extent by the skill of the player (more marked in video games).
- The provision of audio and visual rewards for a winning move (e.g. flashing lights and electronic jingles).
- The provision of an incremental reward for a winning move (points or cash) which reinforce "correct" behavior.
- Digitally displayed scores of "correct behavior" (in the form of points or cash accumulated).

- The opportunity for peer group attention and approval through

    competition (pp. 206-207).

This list of similarities between slot machines and video games is important because this information provides further justification for using pathological gambling as criteria to develop a diagnosis of video game addiction.

Wood, Gupta, Derevensky, and Griffiths (2004) also examined similarities between video game play and gambling in the context of non-specific risk-taking behaviors such as engaging in physically dangerous situations or getting into situations that are not easily resolved. The authors found that excessive video game playing and gambling were linked by an increase in perceived excitement. These individuals were also more likely to become deeply psychologically absorbed during gambling and game play than participants who reported that they did not engage in risk-taking behaviors. Participants who reported more pathological degrees of gambling were more likely to use video games to cope with negative life events (Wood et al., 2004).

Studies that examine the role of dopamine in the brain also provide support for using the pathological gambling paradigm to study pathological video game play (Spanagel & Weiss, 1999). Video games and gambling slot machines share the characteristic of similar reward schedules and the release of the neurotransmitter dopamine is significant in the reward process for both activities. The pleasure associated with dopamine release may encourage the development of both pathological gambling and video game addiction. The pleasure associated with dopamine is important in the progression of addiction because, as Hou et al. (2012) mentioned, impairment of dopamine receptors leads to an increase in a specific, addictive behavior in order to

achieve that same effect. Looking at dopamine from a different perspective, Weinschenk (2012) suggests that dopamine may encourage addiction to technology because it's release perpetuates seeking behavior. For example, technology such as texts and Twitter may be used incessantly because they are random and unpredictable and dopamine is stimulated when something unpredictable occurs. Video games and the Internet may provide similar unpredictable stimulation, encouraging dopamine production, which encourages further stimulation-seeking.

Research on Video Game Addiction

Research to examine the prevalence of addictive degrees of game playing among video game players is emerging. Salguero and Moran (2002) studied 223 adolescents in southern Spain. For this study, a brief questionnaire assessing problem video game play was developed based on DSM-IV (APA, 1994) criteria for pathological gambling. All responses utilized a dichotomous "Yes" or "No" response; however, no specific score was established to indicate whether or not an individual would be classified as addicted to video games. The researchers concluded that individuals who scored higher on the questionnaire were more likely to describe their game play as being difficult to stop, to use video games as an escape, and to withdraw socially. Males exhibited more symptoms of problematic video game play than females.

Hague and Gentile (2003) examined self-report data from 607 adolescents that included a description of video game habits and a seven-item scale measuring video game addiction adapted from pathological gambling criteria. For this study, those who answered "Yes" to four or more items were classified as addicted while those who answered "No" to a minimum of six items and "Sometimes" to a maximum of one were

classified as non-addicted. Adolescents who were classified as being addicted also had significant problems that included being more likely to report having been in a physical fight in the past year, having more arguments with friends, and having lower academic grades.

A study by Chiu, Lee, and Huang (2004) of video game addiction in 1,228 children and teenagers in Taiwan examined demographic characteristics of addicted gamers. Those participants classified by the researchers as being addicted to video games were more likely to play games in the genres of action/adventure and role-playing. Males were more likely to be addicted to violent video games than females. Male participants also scored lower than females on measures of family functioning, higher in sensation seeking, and higher in boredom inclination (Chiu, Lee, & Huang, 2004).

Grusser, Thalemann, and Griffiths (2007) examined rates of video game addiction in a larger sample, considering the relationship between addiction to video games and aggressive behavior. From an online sample consisting of 7,069 gamers, 840 participants (11.9%) fulfilled the diagnostic criteria for video game addiction based on key symptoms of a dependence syndrome outlined in the ICD-10 (World Health Organization, 2008). Participants who fulfilled three out of the six criteria for dependence were classified as pathological gamers. Dependent gamers were more likely to experience withdrawal symptoms occurring from not playing video games. They were also more likely to crave playing video games while away from gaming (Grusser et al., 2007). This study suggests that individuals who met these researchers' criteria for being addicted to video games experience physical symptoms and cognitive discomfort when they were not able to play video games.

Gentile (2009) conducted the first national study examining the prevalence of video game addiction in American youth and related individual characteristics. He also investigated parental involvement in children's gaming. In this sample of 1,178 youth ages 8 to 18, 8.5% of the individuals met the criteria for pathological gaming as defined by meeting 6 out of 11 symptoms on a questionnaire based on the criteria for pathological gambling (Gentile, 2009). Participants who met criteria for pathological video game play had started to play video games at an earlier age, played more often and for longer amounts of time, received worse grades in school, were more likely to have attention problems, and were more likely to have physical problems attributed to long hours of play when compared with those who did not meet the pathological play criteria, such as hand and wrist pain. Males were more likely than females to experience these difficulties. Participants who met criteria for pathological gambling were also more likely to report believing they were addicted to video games, having others think they were addicted, getting into more physical fights in the past year, and having access to video games in their bedroom (Gentile, 2009).

Gentile et al. subsequently conducted a longitudinal study that examined pathological video game use in youth over a two-year span (Gentile et al., 2011). Risk factors for becoming addicted to video games, length of the disorder, outcomes, and whether pathological gaming was a primary or secondary problem were examined in this study. There were several characteristics that could serve as risk factors to becoming a pathological gamer: impulsivity, lower social competence and empathy, and display of poor emotional regulation. Additionally, once a player became a pathological gamer, these individuals were more likely to have lower grades in school and have their

relationships with family and friends affected by game play. Pathological gamers were more likely to play violent video games and to show more aggressive behaviors. With regard to mental health factors, this study appeared to show that pathological gaming could cause mental health issues such as depression, anxiety, and social phobia. This is important to mention because the results indicate that these mental health disorders occurred after pathological gaming was identified and resolved when pathological game play stopped (Gentile et al., 2011). These results suggest that pathological gaming may lead to the development of mental health disorders as opposed to such disorders being the catalyst for video game addiction.

Lemmens, Valkenburg, and Peter (2011) examined the influence of pathological video game play on aggressive behavior over an extended period of time. Participants were 540 Dutch adolescents who indicated that they played video games at Time 1 and Time 2 (6 months later). Thirty-four participants met criteria for pathological gaming at Time 1 and 21 participants met the criteria at Time 2. Those who showed more signs of pathological gaming were more likely to play longer and more often 6 months later than participants who were not considered to be addicted to video games. Those who showed more signs of pathological gaming were more likely to have an increase in self-reported aggressive behavior over the 6 months regardless of whether or not the individual played violent or non-violent games (Lemmens et al., 2011). The authors hypothesize that these results suggest that the aggression reported by the participants who exhibit more symptoms of pathological gaming could be related to frustration when they are unable to play video games (Lemmens et al., 2011). For example, more aggression could be shown toward parents because they are agents who try to restrict game play, or more aggression

could be shown at school because the individual is irritable because they are unable to play games in this setting.

Important research into the neurological effects of video game addiction is also being conducted. One study compared a group of adolescents with problematic online game play versus a non-problematic sample (Kim, Han, Lee, Kim, & Renshaw, 2012). Over a period of four weeks, individuals meeting criteria for video game addiction kept track of game playing time. Additionally, they received a targeted treatment that consisted of coming into the clinic twice a week to receive information about how to reduce excessive game play. All participants completed a simple and a complex task to assess working memory before and after treatment. Prior to the treatment, participants with problematic game play performed poorly on the working memory tasks relative to those who did not meet criteria for problem game play. After treatment, individuals with problematic game play significantly increased their performance on the working memory tasks when compared to those who did not meet criteria for pathological play (Kim et al., 2012). This research is important because it appears that there are parallels between working memory issues found in pathological game players and in individuals with substance abuse problems.

Video game engagement. Video game researchers are beginning to consider the topic of psychological engagement (Brockmyer, et al., 2009; Przybylski, Rigby, & Ryan, 2010), particularly regarding the role of deep engagement in the development of pathological degrees of game-playing. While engagement in video game playing is typically experienced as being positive, researchers believe that deep engagement and addiction to video games could be linked. The concept of engagement is related to the

experience known as "flow," which was first described by Csikszentmihalyi and Lefevre (1989). Flow is described as the "holistic experience that people feel when they act with total involvement" (Csikszentmihalyi & LeFevre, 1989, p. 815). According to Csikszentmihalyi, flow consists of three elements: control, curiosity, and intrinsic interest. When individuals enter into a flow state they are, by definition, completely absorbed in that activity. They enter an altered state of consciousness in which they feel in complete control of their environment (Csikszentmihalyi & LeFevre, 1989).

Researchers have studied the concept of flow in relation to a variety of behaviors, including playing video games. One such study was conducted by Chou and Ting (2003) who hypothesized that people who develop a flow experience have a tendency to repeat that activity because the activity is enjoyable; thus, having a flow experience could be a precursor to addiction. The focus of their study was online gaming. The sample consisted of 30 undergraduate students with online interactive game experience. Participants completed a measure assessing various aspects of addiction and flow. Positive correlations were found between flow experience, repetitive video game play, and video game addiction (Chou & Ting, 2003). The researchers suggest that the experience of reaching a flow state encourages repeating an activity, possibly leading to an addictive degree of repetition of the behavior, in this case, playing video games.

More recently, a specific measure of video game engagement has been developed (Brockmyer et al., 2009). The experience that an individual has while playing a video game can be viewed on a continuum of increasing engagement from presence, to flow to psychological engagement. Two separate studies were conducted to demonstrate the validity of the 19-item Game Engagement Questionnaire (GEQ). In the first study,

participants were given the GEQ with a battery of other questionnaires. Results based on traditional and Rasch analyses indicated that the GEQ is a valid measure of psychological engagement in playing video games and that three specific levels of engagement can be distinguished. In the second study, participants were given the GEQ and other questionnaires before and after playing a violent video game. Approximately halfway through a 20-minute gaming session, a recording was played in an adjacent room with the statement, "Did you drop your keys?" made three separate times. The lower the GEQ score (less tendency to be psychologically engaged), the more likely participants were to respond to the first statement (to have their concentration on the video game interrupted).

A pilot study by McBroom, Brockmyer, Knox, and Bullock (2009) examined characteristics of 29 video game players in a sample of participants who played video games 10 or more hours a week. There was a strong relationship ($r = .55$) between the GEQ and the 11-item pathological gaming scale utilized by Gentile (2009). These results suggest that the possible relationship between video game engagement and pathological video game play warrants further study.

Skoric, Teo, and Neo (2009) examined video game addiction, engagement, and academic performance in adolescents in Singapore. They found that symptoms of video game addiction were negatively related to school performance. However, this relationship was not true for total hours spent playing video games or for degree of video game engagement (2009). Seok and DaCosta (2012) examined video game engagement and addiction among a high school sample of Korean adolescents. Their results suggested that two groups of adolescents (those who met criteria for video game

addiction and another group with high engagement) stated that they would have difficulty stopping their video game play.

The growing appeal of online video game play. The introduction of online video games has changed the face of gaming not just in the way individuals play video games, but in the way people can interact with other gamers in an online setting. Researchers have noted that there has been a shift in perceptions about online video game players. The stereotypical video game player was typically seen as a socially awkward and isolated adolescent (Griffiths, Davies, & Chappell, 2003; Jansz & Martens, 2005).

Griffiths et al. (2004) examined characteristics of adolescent and adult players who play a popular role-playing game known as a Massively Multiplayer Online Role Playing Game (MMORPG) game *Everquest*. A sample of 540 participants completed an online questionnaire examining demographic factors and other factors including frequency of play, likes and dislikes about the game, and whether or not players sacrifice anything to play. Player age ranged from 12 to 70-years. The majority of the participants were male in both the adolescent ($n = 88$) and adult ($n = 437$) groups; however, 20.4% of the adult group was female compared to the adolescent group where only 6.8% was female. Survey data indicated that males typically played this game more than females. Interestingly, the typical amount of playing time was around twenty-five hours per week, and socializing was the most important reason for play. In other words, connecting and developing relationships was an important reason for online video game play for this sample. Also, while the researchers did not specifically study addiction, many of the participants reported that they sacrificed at least one aspect of their lives to play the video game, which is an important aspect of addiction (Griffiths et al., 2004).

Lo, Wang, and Fang (2005) examined physical interpersonal relationships (e.g. relationship with friends in real life) and the role of social anxiety among online video game players. A sample of 174 Taiwanese college-age students completed a questionnaire assessing time spent playing games, quality of interpersonal relationships, and severity of social anxiety. Of the 174 participants, 32 were identified as "heavy players" who reported spending 4.7 hours per day, seven days week on average. Participants also completed measures assessing interpersonal relationships and levels of social anxiety. Heavy gamers experienced less fulfilling interpersonal relationships and had more symptoms of social anxiety that increased with game usage (Lo et al., 2005). These results suggest that online video game players, especially heavy players, may be at increased risk for addiction due to greater time spent online. These gamers may also experience anxiety stemming from poor interpersonal relationships and increased social isolation.

Cole and Griffiths (2007) examined the social interactions of players of the MMORPGs genre through an online survey. They collected demographic information, as well as information pertaining to in-game social interactions, as well as information about the negative effects of game playing in their daily lives. The sample consisted of 912 (261 females) players of MMORPGs who were recruited from gaming websites and a local university. Males typically had more good friends (average of 7.7) than females (average of 3.1 friends), but females reported that they were more likely to meet up with these friends in real life than males. Furthermore, females indicated that they were more likely to be attracted to and date another player than males, were more likely to play MMORPGs with friends and family than males, and were more likely to discuss sensitive

issues online (e.g. family problems, sexuality issues, work, etc.) than male gamers. Additionally, 20.3% of the participants indicated that they believed playing MMORPGs had an adverse effect on their relationships with friends outside the gaming group (Cole & Griffiths, 2007). A few analyses were conducted by gender and there was no difference found between males in females with respect to hours played and number of friends made online. One gender difference was identified suggesting that females were more likely than males to see personal relationships suffer as hours spent playing per week increased.

Video game genre and video game addiction. In multiple studies, first person shooters and MMORPGs have been identified as the most popular game genres (Van Rooij, Schoenmakers, Vermulst, Van den Eijnden, Van de Mheen, 2011; Seok & DaCosta, 2012). Much of the research on video game addiction has focused on the MMORPG genre; however, first person shooters are also gaining research attention.

Part of the reason MMORPGs are growing in popularity is that these role-playing games incorporate many different elements. These include socialization (e.g. talking to other players, joining guilds, etc.), violent features (fighting other players, killing creatures, etc.), soloing (playing the game alone), game features (e.g. upgrading skills, outfitting, etc.), and other general features (e.g. exploring new areas, strategy, etc.) (Griffiths et al., 2004). *World of Warcraft* (WoW) is probably the most popular game in this genre with over 10 million subscribers worldwide (Statista, 2012). The majority of individuals who play these games are typically college age or older. It should be noted that MMORPGs do not have an ending, meaning that players can continue to play, theoretically, forever with the goal of making their character more powerful by collecting

items. Also, in MMORPGs, longer periods of game play are required in order to make progress in the game (Griffiths et al., 2003; Griffiths et al., 2004; Jansz & Tanis, 2007). Given these factors, it is important to examine the effect that MMORPGs may have on the development of video game addiction.

Smyth (2008) examined the longitudinal effects of video game play in a number of different types of video games with a specific emphasis on players of MMORPGs. In this study, 100 participants (27 female) between the ages of 18 and 20 years were randomly assigned to one of four conditions (different game genres) that included arcade games, console play, solo computer play, and MMORPG. The study lasted one month and participants in the study were instructed to play a minimum of one hour per week, but they were allowed to play more. After one month, the results suggested that, of the four groups, players in the MMORPG condition differed significantly from the other groups in more hours played, worse overall health and sleep quality, and continuing to play the video game after the study had completed, formed at least one new friendship online, and had more interference with real-life socialization. Surprisingly, the results did not support the hypothesis that the MMORPG group would report lower school performance; however, the limited time frame of a one-month study may have not allowed sufficient time to identify a difference (Smyth, 2008). Again, factors unique to MMORPGs appear to contribute to more negative outcomes compared to other types of video games.

Smahel, Blinka, and Ledabyl (2008) also studied MMORPGs and hypothesized that a player's identification with their in-game avatar could be connected to video game addiction. An avatar is the actual character in the video game controlled by the player

and many video games allow the individual to customize their avatar's appearance, skills, and abilities. This study primarily focused on players of the games *World of Warcraft* and *Everquest 1 & 2*, with a small number of participants playing other MMORPGs. A total of 548 participants (84.6% male) were divided into one of three groups based on age: adolescents (12-19 years), young adults (20-26 years), and adults (27 years and older). These participants completed a 64-item questionnaire in which 14 questions measured MMORPG addiction and 10 questions related to identification to the character. Results suggested that the amount of time spent playing the game was related to higher addiction scores. Identification with one's avatar was found to be a contributing factor to addiction (Smahel et al., 2008). These results suggest that individuals who play MMORPGs show higher levels of addiction than those who do not, and character identification may be a contributing factor to the development of addiction.

Building on this research, Hsu, Wen, and Wu (2009) looked at user experiences of addiction to MMORPGs. Using a scale developed by Chou and Ting (2003) to measure online game addiction, the authors found that higher scores on the addiction scale were positively correlated with hours spent gaming per day and days played per week. The researchers also found five significant characteristics of MMORPGs that significantly predicted addiction: curiosity, reward, belonging, obligation, and role-play. Curiosity refers to finding new parts of the game world, reward indicates the positive feeling associated with accumulating gold and finding better items, belonging and obligation refer to social aspects of developing relationships with other game players, and role-playing refers to character progression and developing an attachment to ones own character (Hsu et al., 2009).

Moore and Brockmyer (2009) examined the negative consequences that can occur from playing MMORPGs. This study included 106 participants (39.8% male) who completed a series of questionnaires assessing factors such as Internet addiction, life satisfaction, aggression, and empathy. Participants were divided into two groups, players and non-players, and 33% of the sample indicated that they played MMORPGs. This group was classified as the player group, while the remaining 66% were classified as the non-players. This study reinforced the results of previous research by suggesting that MMORPG players reported higher levels of Internet addiction than non-players. In addition, more time spent playing video games was connected with lower satisfaction with life and with friends. This finding is consistent with previous research suggesting that online game play allows the individual to form relationships with other players in-game and these relationships may be more satisfying to players than their real- life relationships (Smyth, 2008; Ng & Wiemer-Hastings, 2005). This study builds upon previous research suggesting that MMORPGs may place individuals at greater risk for developing video game addiction than other types of video games.

Van Rooij et al. (2011) examined a sample of online game players between the ages of 13 and 16. Participants who spent the most time per week playing video games online were those who listed first person shooters and MMORPGs as their favorite video game genre. An addicted, heavy online gaming group was identified by comparing scores hours spent online gaming and scores on the Compulsive Internet Use Scale (CIUS; Meerkerk, Van den Eijnden, Vermulst, & Garretsen, 2009). This small sample of six participants identified as addicted heavy online gamers spent 55 hours per week

playing; half of this sample was still addicted to games when they were assessed one year later (Van Rooij et al, 2011).

Elliot, Golub, Ream, and Dunlap (2012) found that the genre of video game preferred was a strong correlate of problematic video game play. Participants who could be considered addicted to video game play comprised less than 5% of a sample size of 3,380 participants. Of the participants who could be considered addicted to video games, the genres with the strongest correlations were first person shooters, massively multiplayer online role playing games (MMORPG), action-adventure, and gambling games. The researchers suggest that these game types should be further studied to examine just how they might contribute to the reward mechanisms of addictive behavior (Elliot et al., 2012).

While the majority of studies examining video game addiction and online play have focused on MMORPGs, the association between addiction and first person shooters also deserves consideration. Console systems now allow video game players to interact with others online. For example, the Xbox 360 has an online function called Xbox Live. This system allows players to play games like *Halo* 4, *Call of Duty: Black Ops* 2, and many other games of different genres online and use a microphone to communicate with others while playing. This type of video game play appears to have been largely overlooked in game addiction research.

The importance of video game violence. Many of the most popular video games are either MMORPGs or first person shooters. First person shooters are, by definition, violent games and MMORPGs almost always contain violence.

Anderson et al. (2010) conducted a meta-analysis of the effects of violent games on aggression, prosocial behavior, and empathy in Eastern and Western countries. The results of the meta-analysis indicated that playing violent video games increased aggressive behavior, cognition, and affect. Exposure to video game violence was also related to lack of empathy, desensitization, and less prosocial behavior. The relationship between playing violent video games and addiction is still unclear, though clearly worthy of study.

In summary, the body of research exploring video game addiction indicates that this phenomenon is a growing concern and should be given serious consideration as a diagnostic entity, particularly because of the violent content of the most popular games. Identifying factors that may contribute to problematic video game playing habits or addiction warrants continued examination.

Gender in Video Game Research

Considerable research suggests that, within the college student population, men are more likely to play video games than women (Ogletree & Drake, 2007). In one study, men were also more likely than women to report that video games interfered with sleep, class work, and relationships (Ogletree & Drake, 2007). Regarding pathological game habits, Desai et al. (2010) studied gender differences in problematic gaming and health concerns in a sample of 4028 adolescents in Connecticut. More girls ($N = 2139$) than boys participated in the study and results indicated that boys were more likely than girls to show symptoms of problematic gaming as defined by meeting 3 or more symptoms of impulse control disorder criteria modified for gaming. However, the girls who reported being involved in gaming were more likely to have problems such as

getting into fights and carrying weapons than girls who did not play video games. Across this sample, adolescents who played video games were more likely to report smoking and substance use than those who did not play video games.

The portrayal of women in video games may influence female attraction to this leisure activity. Perceptions of male and female college students who play video games suggests that the portrayal of gender in video games is that most main characters are male, female characters are sexually provocative, less strong and aggressive, and more likely to need saving (Ogletree & Drake, 2007). Miller and Summers (2007) examined gender differences in video game characters across 49 articles from video game magazines over 3 years. Results indicated that males are more likely to be heroes and main characters, carry weapons, have better special abilities, and be more muscular and powerful. Females were more likely to be supplemental characters, to be viewed as attractive, sexy, and innocent, and to wear more revealing clothing (2007).

Dill and Thill (2007) also examined how males and females are portrayed in video game magazines, and they also garnered report of teenagers' views of gender in video games. In examining how males and females are portrayed in video game magazines, the results suggested that males are featured much more than females. Additionally, males are more likely to be portrayed as aggressive, carry weapons, and be in an aggressive stance. Females were typically shown to be sexual, wear skimpy clothing, or having thin body type. Teenagers' perception of gender portrayal in video games was in agreement with these stereotypical gender roles. Dill, Brown, and Collins (2008) examined how exposure to these stereotyped characters influences tolerance for sexual harassment. Participants were exposed to pictures of video game characters that

were hyperaggressive males or hypersexual female characters. Another group consisted of participants who were exposed to pictures of real life males and females dressed in professional attire. Both groups completed measures of sexual harassment and rape myths. Participants then read a vignette about a male professor harassing a female student. Analyses suggested that males who were exposed to female sexualized video game characters were the most tolerant of sexual harassment when compared to males exposed to professional pictures and to females in both conditions. Additionally, females exposed to the sexualized pictures of women decreased their tolerance for harassment more than any other group (Dill et al., 2008).

It is, of course, worth noting that some stereotypes are accurate and useful in limiting the amount of information processing that is needed (Lee, 2011; Lee, Jussim, and McCauley, 2013). Lee (2011) suggests that when looking at stereotypes we need to evaluate them carefully to determine the accuracy. However, as research on gender stereotypes in video games has demonstrated, stereotypes of women in video games are inaccurate. Constant bombardment by inaccurate stereotypes of women in video games may result in automatic application of negative beliefs and judgments about women for some.

Taken together, these studies suggest that many video games reinforce traditional gender stereotypes and that exposure to these stereotypes can reinforce negative beliefs about women, especially for males. Furthermore, these studies seem to imply that men may be more attracted to video games than women because of the emphasis on masculinity, male dominance, and sexual depictions of weaker female characters.

Parental Awareness of Child's Technology-Addictive Behaviors

The adult literature suggests that addiction to the Internet and to video games is a real phenomenon. Less is known about children's use of this technology. Theoretically, parents should be monitoring children's usage and their related behaviors so that overuse and dependence can be avoided.

Much of the literature examining parental awareness about children's video game habits has focused on parents' knowledge about game content. A 2006 Federal Trade Commission survey of 1311 parents found that 89% of the sample was aware of the ESRB ratings system and 73% actually use the ratings system (Funk, 2007). Another survey of 500 parents by the ESRB in May 2007 showed that, at that time, 90% of the sample was aware of the ratings system and 85% use the ratings system (Funk, 2007).

Funk, Brouwer, Curtiss, & McBroom (2009) surveyed an educated sample of 94 parents. In this sample, 72% of the parents stated that they were aware of the video game ratings system but only 22% of the sample would actually use the system (Funk et al., 2009). Level of knowledge of appropriate screen time based on expert recommendations for children five and under was also assessed through a series of multiple-choice questions. Only 34% of parents were able to identify the appropriate amount of screen time for a preschool aged child, while 43% correctly identified the appropriate screen time for a child age 2 and under.

Research reported by Walsh, Gentile, Walsh, and Bennett (2006) indicated that 89% of teens surveyed said their parents never put a limit on the amount of time spent playing video games. Furthermore, 90% of the youth surveyed in grades 8 through 12 reported that their parents never check the ratings of video games before allowing a

purchase. Only 1% of the youth reported that their parents had ever prevented them from purchasing a game because of its rating (Walsh et al., 2006).

Research suggests that parents' and children's views about parental monitoring of video games differ in important ways. Funk, Hagan, and Schimming (1999) compared parent and child perceptions of children's habits and preferences regarding video games. The results indicated that, when parents were asked to identify their child's favorite game, most either named an incorrect game or were not able to identify any favorite game. In 70 % of the incorrect matches, children described their favorite game as being violent (Funk et al., 1999). This discrepancy between the reports of parents and children suggests that parents may be unwilling or unable to recognize or admit that they do not monitor their child's exposure to video games.

A comparison of the results of surveys by the ESRB and an independent media watchdog (Mediawise) further demonstrates a discrepancy between the views of parents and children about parental monitoring. The ESRB found that 74% of parents use ratings in helping them choose games and 94% find the ratings helpful (Walsh et al., 2006). However, research by Mediawise found that 73% of parents reported that they help decide what games their children play while only 30% of children report parental involvement (Walsh et al., 2006).

Further research into parental awareness of violent video game content by McBroom, Brockmyer, Knox, and Bullock (2008) provides additional insight into the question of parental monitoring. A sample of 67 parents (60 mothers and 7 fathers) was recruited from local area parent groups. They completed a demographic questionnaire as well as a questionnaire assessing parental attitudes about and awareness of the content of

violent video games. Initially, parents demonstrated poor awareness of violent content and made reference to their low level of knowledge as they completed the measures. Next, parents viewed a presentation showing clips of violent video games. Then the experimenter presented information about the results of psychological studies on the effects of violent video games and effective mediation strategies. Finally, parents again completed the awareness questionnaire. Results indicated that parents' level of awareness improved significantly (McBroom et al., 2008).

With respect to Internet use, there is some research available regarding parents knowledge of children's Internet use. Liau, Khoo, and Hwa Ang (2008) conducted two studies: The first study was a random sample of 1,002 parents and 1,124 adolescents assessing knowledge of Internet safety in the home. The second study was a sample of one hundred sixty nine parent/child dyads assessing time spent online and inappropriate Internet use (e.g. examining pornographic sites). The results of the two studies indicated that parents tended to underestimate children's risky Internet behavior and overestimate parental monitoring of Internet usage. Mothers appeared to have greater agreement with children on monitoring of Internet use than fathers.

It appears that parents' knowledge of content, mediation strategies, ratings, and supervision of video game play and Internet use is relatively limited. It seems plausible to assume that since parental monitoring of time spent is low, they may not be aware of behaviors indicating addiction. Therefore, it is important to examine parental knowledge of possible symptoms of pathological video game and Internet use.

Hypotheses

The present research has two primary goals. The first goal is to identify possible correlates and predictors of video game addiction for adults. Second, the question of how closely parent's rating of their child's potentially addictive game-playing behaviors matches their child's assessment of the same behaviors was examined.

Hypothesis 1: Significant positive relationships will be found between video game addiction, Internet addiction, video game engagement, and video game habits such as time spent playing.

Hypothesis 2: Differences will be found between males and females in their game playing habits, video game addiction, and Internet addiction.

Hypothesis 3: Participants who indicate that their favorite video game belongs to either the first person shooter or MMORPG genre will have higher scores on measures of Internet addiction, game engagement, and video game addiction than those who prefer other genres.

Exploratory Research Questions

Exploratory Question 1: Video game addiction, level of engagement in video game-play, and video game habits will be significant predictors of Internet addiction.

Exploratory Question 2: Parent and child report of the child's favorite video game, and the game's genre, will not match for a majority of the participants.

Exploratory Question 3: Parents will report that their child spends fewer hours spent playing video games per week than the child reports, and they will report fewer symptoms of video game addiction as compared to the child's report.

Exploratory Question 4: Parents will report fewer symptoms of Internet addiction than the child based on a comparison of parent and child reports about the child's Internet behavior on the IAT.

Chapter Three

Method

Study 1

Participants

Study 1 examined possible predictive factors for video game addiction in the adult population (18 years of age or older). To examine the association between online video game play and video game addiction, a medium effect size of $d = .41$ based on a study by McBroom et al. (2009), which examined differences between online and offline video game players with video game addiction, was used. Using this value in conjunction with Cohen's power tables (1992), it was determined that a sample size of 128 participants would be sufficient to obtain significant results with a power equal to .80, given a likely effect size of .50.

The current study utilized a sample of 349 participants (214 females) who ranged in age from 18 to 45 years old. Participants were recruited from two different sources that included University of Toledo undergraduates ($n = 336$) and the web site multiplayergames.com ($n = 13$). Table 1 lists the demographic information for the total sample and Table 2 presents the means and standard deviations of demographic information for the total sample.

Table 1

Demographics of the Total Sample

Variable	N	Percent
Gender		
Male	124	35.5%
Female	214	61.3%
Ethnicity		
White/Caucasian	254	72.8%
African American	43	12.8%
Hispanic/Latino	9	2.6%
Asian/Pacific Islander	21	6.0%
Other	15	4.3%
Missing	7	2.0%
Volunteer activities		
Yes	154	44.1%
No	189	54.2%
Missing	6	1.7%

Measures

Background Questionnaire (Appendix A). The Background Questionnaire was

developed to assess participants' demographic information, including gender, ethnicity,

age, year in school, and approximate yearly income. The questionnaire also assessed

whether or not participants play video games online, the name of their favorite video

game, the genre of their favorite video game, and how many hours that video games are played in an average week.

Internet Addiction Test (Appendix B). The Internet Addiction Test (IAT) (Young, 1996) is a 20-item questionnaire that was developed to measure Internet addiction.   The questionnaire uses a 5-point Likert Scale format with answers ranging from Rarely, Occasionally, Frequently, Often, and Always. Examples of questions include "How often do you stay online longer than you intended?" and "How often does your job performance or productivity suffer because of the Internet?" Two recent studies examining Internet addiction, and physical, and mental health identified internal consistency of .88 for the IAT (Bidi, Pejman, Kareshki, & Ahmadnia, 2012; Alavi, Maracy, Jannatifard, Eslam, & Haghighi, 2010).

Game Engagement Questionnaire (Appendix C). The Game Engagement Questionnaire (GEQ; Brockmyer, et al., 2009) is a 19-item self-report measure of an individual's propensity to become engaged in playing a video game.   Participants respond with Yes, No, or Maybe, and higher scores on the GEQ are indicative of greater engagement. Typical items include "I really get into a game" and "Playing makes me feel calm." Brockmyer et al. (2009) compared two versions of the GEQ, a general and a game specific version, and found good short-term test-retest reliability of $r = .72$.

Pathological Computer/Video Game Use Questionnaire (Appendix D). The Pathological Computer/Video Game Use Questionnaire (PC/VGU) is a 10-item questionnaire developed by Gentile (2009) that assesses an individual's level of pathological video game use. Items include "During the past year, have you become more preoccupied with playing video games, studying video game playing, or planning

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the next opportunity to play?" The Cronbach's alpha was .77 (Gentile, 2009). More

recently, this measure has consistently yielded a Cronbach's alpha of .71 and .77 across

two waves of a study examining pathological video game use, as well as demonstrating a

test-retest reliability of r = .46, $p < .001$ over a year (Gentile, Li, Choo, Sim, Liau, &

Khoo, 2013).

Table 2

Means and Standard Deviations for Demographic Variables of the Total Sample

Variable	N	M (SD)
Participant age in years	342	19.94 (3.69)
Yearly household income	342	$40,001-$60,000 (2.36)
Hours of sleep per night	341	6.91 (1.06)
Hours spent playing video games per week	278	5.17 (7.17)

Procedure

Participants from the University of Toledo signed up on the web site for the

undergraduate research pool. All other participants followed a link posted on the web

site multiplayergames.com, which lead them to the survey via Psychdata.com. All

participants read a brief article (Appendix E) containing information about video game

addiction, instructions on how to complete the questionnaire, benefits of participation,

and links to the study questionnaires. After following the link to the study, participants

read the informed consent and were given the option of discontinuing participation if they

chose not to participate or to follow a link to complete the study questionnaires. Upon

completion of the questionnaires, participants were given the contact information for the

experimenter if they had any questions, or to receive information about video game addiction if they had any concerns about this issue.

Study 2

Participants

Study 2 examined the similarities and differences in ratings by parents and their children on children's behaviors and experiences including video game habits (favorite video game, hours spent playing, etc.), symptoms of Internet addiction, and symptoms of video game addiction. Due to the exploratory nature of this research, and the limited amount of data available on this topic, it was difficult to find relevant research to determine a likely effect size. Therefore, in order to have 80% confidence of detecting a medium effect size in the current study with an alpha set at .05, a minimum of 129 dyads was deemed necessary was (Cohen, 1992). To allow for incomplete data, it was planned to recruit 150 dyads.

Extensive efforts were made to recruit participant dyads. Participants were recruited from the web site education.com, Gesu Elementary School, St. Francis de Sales High School, and William Cullen Bryant Elementary School over a period of six months. A brief article about video game addiction and information about the study with a link to participate (Appendix F) was placed on the education.com web site. At Gesu School, the researcher spoke to the principal who sent the same article with a link to the study out to parents on the school's email list. At St. Francis, the researcher spent a day at the school recruiting students from the AP Psychology classes and gave the article to the students to take home to their parents if they indicated that they would like to participate in the study. At William Cullen Bryant Elementary, the researcher passed out a copy of the

article with the web addresses to students to take home to their parents if they indicated

that they wanted to participate. The researcher went back to each of the classrooms over

a period of three weeks on multiple occasions to remind students about participation.

A total of 17 additional schools in Toledo and Cleveland were contacted about

possible participation. All either declined to participate in the study or did not contact the

researcher back. Despite these extensive recruitment efforts, it was difficult to obtain

linked data from parent-child dyads. In many cases, parents would complete the study

but not include their child as evidenced by the greater number of parent questionnaires

(59) completed in comparison to child questionnaires (28). In some cases it appears that

the identifying numbers chosen between parent and child dyads were not the same so it

was not possible to link the data. After considerable effort, a total of 19 parent-child

dyads could be identified.

Table 3 lists the demographics reported by parents for their children. Table 4 lists

the means and standard deviations for demographics information for children as reported

by their parents.

Table 3

Demographics of the Parent/Child Sample reported by Parents

Variable	*N*	*Percent*
Gender (of child)		
Male	13	68.4%
Female	5	26.3%
Missing	1	5.3%
Relationship to Child		

Mother	14	77.8%
Father	4	22.2%
Missing	1	5.3%
Ethnicity		
White/Caucasian	14	73.7%
Asian/Pacific Islander	2	10.5%
Other	2	10.5%
Missing	1	5.3%
Volunteer activities		
Yes	6	31.6%
No	12	63.2%
Missing	1	5.3%

Table 4

Means and Standard Deviations for Demographic Variables of the Parent/Child Sample

as Reported by Parents

Variable	*N*	*M (SD)*
Child's age in years	18	12.83 (2.96)
Yearly household income	18	Over $60,000 (1.10)
Child's average hours of sleep per night	17	8.12 (1.05)

Measures

  Background Questionnaire - Parent (Appendix G). The demographic information obtained from parents was the same in Studies 1 and 2. In Study 2, additional questions assessed parent's knowledge of whether or not their child plays video games online, the name of their child's favorite video game, the genre of their child's favorite video game, and how many hours their child plays video games in an average week.

  Internet Addiction Test - Parent (Appendix H). This questionnaire was modified from the standard format used in Study 1 to assess parent's beliefs about their child's symptoms of Internet addiction. For example one question was modified to read "How often do you find that your child stays online longer than needed?" In Study 2, two of the questions that would not apply to children were removed. These questions were "How often do you prefer the excitement of the Internet to intimacy with your partner?" and "How often does your job performance or productivity suffer because of the Internet?"

  Internet Addiction Test - Child (Appendix I). The same version of the IAT (Young, 1996) was used as in Study 1, except two of the questions that did not apply to children were removed. These questions were "How often do you prefer the excitement of the Internet to intimacy with your partner?" and "How often does your job performance or productivity suffer because of the Internet?"

  Game Engagement Questionnaire - Parent (Appendix J). This questionnaire was modified from the standard version so that answers would reflect parent beliefs about their child's level of engagement in video games. Examples of modified questions

include "While my child is playing, he/she loses track of time" and "While my child is playing, he/she feels different."

Pathological Computer/Video Game Use Questionnaire - Parent (Appendix K). This questionnaire was modified from the standard version so that answers would reflect a parent's beliefs about their child's symptoms of video game addiction. Examples of modified questions include "In the past year, has your child sometimes tried to limit his/her own playing?" and "In the past year, has your child ever lied to family or friends about how much he/she plays video games?"

Procedure

Participants who found the study on the Education.com web site read the same article as the adults in Study 1 and followed a link to the web site to complete the study. Parents at Gesu Elementary School were given access to a Microsoft Word document of the article through a link that was emailed to all parents on the schools contact list. Participants at William Cullen Bryant Elementary School had a hard copy of the article given to the child, which they took home. These parents were instructed to type the web address for the questionnaire into their web browser if they chose to participate since this school did not have an email contact list for parents. After following the link to the appropriate study, participants read the informed consent and were given the option of closing out of the study if they chose not to participate or to follow a link to complete the study questionnaires. Parents gave informed consent for their child to participate and entered an identification code given to them after completing the study that allowed their questionnaire to be linked to their child's. Parents were supposed to help their child find the link to the questionnaire and type in this code before their child began the study.

Children could then complete the questionnaire online. Upon completion of the

questionnaires, participants were given the contact information for the experimenter if

they had any questions, or to receive information about video game addiction if they had

any concerns about this issue.

Chapter Four

Results

Study 1

Preliminary Analyses

Summary scores were computed for participant reports on the IAT *(*Internet Addiction Test*)*, GEQ *(*Game Engagement Questionnaire*)*, and PC/VGU *(*Pathological Computer/Video Game Use Questionnaire*)*. Reliability statistics were calculated for the IAT (Cronbach's alpha = .92), GEQ (Cronbach's alpha = .89), and PC/VGU (Cronbach's alpha = .60). It should be noted that gender was dummy coded for the analyses with males = 1 and females = 2. Table 5 presents the means and standard deviations for key study variables for the adult sample.

Table 5

Means and Standard Deviations for Major Study Variables in the Adult Sample

Variable	N	M (SD)	Range
IAT	343	49.13 (23.14)	20-119
GEQ	341	29.73 (7.69)	19-51
PC/VGU	347	27.68 (2.46)	14-42

Note. Possible range for IAT = 20 to 120; possible range for GEQ = 19 to 57; possible range for PC/VGU = 14 to 42.

Interestingly, both males and females in this sample reported that their favorite game belonged to the first person shooter genre. A majority of participants (64.2%) reported that they also play video games on other devices, such as iPods or cell phones. A small percentage of the participants (4.3%) indicated that they typically play video

games an average of between 20 to 40 or more hours a week. Surprisingly, only 37.8%
of the participants reported that they play video games online while 54.8% indicated that
they do not. Table 6 presents background information for the male adult sample. Table 7
presents background information for the female adult sample.

Table 6

Background Information for Males, Total Sample

Variable	N	Percent
Ethnicity		
White/Caucasian	97	78.2%
African American	13	10.5%
Hispanic/Latino	3	2.4%
Asian/Pacific Islander	8	6.5%
Other	3	2.4%
Volunteer activities		
Yes	46	37.1%
No	78	62.9%
Favorite video game genre		
Fighting	5	4.0%
First Person Shooter	49	39.5%
Action-Adventure	7	5.6%
Role-playing game	11	8.9%
Life simulation	3	2.4%
Strategy	7	5.6%

Variable	N	Percent
Vehicle simulation	2	1.6%
Sports	27	21.8%
Music games	2	1.6%
Puzzle games	2	1.6%
Other	9	7.3%
Plays video games on other devices		
Yes	83	66.9%
No	41	33.1%
Plays video games online		
Yes	84	67.7%
No	37	29.8%
Missing	3	2.4%

Table 7

Background Information for Females, Total Sample

Variable	N	Percent
Ethnicity		
White/Caucasian	155	72.4%
African American	29	13.6%
Hispanic/Latino	6	2.8%
Asian/Pacific Islander	12	5.6%
Other	11	5.1%
Volunteer activities		

Yes	106	49.5%
No	108	50.5%
Favorite video game genre		
Fighting	7	3.3%
First Person Shooter	33	15.4%
Action-Adventure	33	15.4%
Role-playing game	14	6.5%
Life simulation	24	11.2%
Strategy	6	2.8%
Vehicle simulation	7	3.3%
Sports	12	5.6%
Music games	22	10.3%
Puzzle games	23	10.7%
Other	27	12.6%
Missing	6	2.8%
Plays video games on other devices		
Yes	139	65.0%
No	73	34.1%
Missing	2	0.9%
Plays video games online		
Yes	47	22.0%
No	166	77.6%
Missing	1	0.5%

Primary Analyses

  Correlations among major study variables. Bivariate correlations were
computed for key study variables in the total sample (Table 8). Separate bivariate
correlations were also computed for males (Table 9) and females (Table 10). For the
total sample, gender was related to hours spent playing, playing games online, Internet
addiction, and game engagement. Playing video games online was also associated with
Internet addiction and engagement. For males, hours spent playing video games was
related to playing video games online and engagement. Females also demonstrated these
relationships.

Table 8

Correlations Among Major Study Variables in the Total Sample

Variable	1	2	3	4	5	6	7
1. Gender		.01	-.39**	.47**	.14*	-.12*	.03
2. Other devices			-.12	.13*	.08	-.19**	.06
3. Hours spent playing				-.43**	-.03	.29**	-.01
4. Play games online					.21**	-.26**	.08
5. IAT Total						.03	-.04
6. GEQ Total							.02
7. PC/VGU Total							

Note. $N = 334$
** $p < .01$.
 * $p < .05$.

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Table 9

Correlations for Males Among Major Study Variables

Variable	1	2	3	4	5	6
1. Other devices		-.12	.25**	.13	-.18	.17
2. Hours spent playing			-.28**	.06	.27**	.06
3. Play games online				.16	-.30**	.09
4. IAT					.03	-.04
5. GEQ						.08
6. PC/VGU						

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

Table 10

Correlations for Females Among Major Study Variables

Variable	1	2	3	4	5	6
1. Other devices		-.13	.09	.05	-.19**	-.04
2. Hours spent playing			-.36**	-.02	.31**	-.10
3. Play games online				.19**	-.17*	.08
4. IAT					.02	-.06
5. GEQ						-.03
6. PC/VGU						

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

Regression analyses. Multiple regression analyses were conducted to identify predictors of Internet addiction. Gender was entered on the first step as a predictor, video game engagement (GEQ) was entered next, and finally whether or not the participant played video games online and video game addiction were entered. The step utilizing gender was significant, $R^2 = .01$, adjusted $R^2 = .01$, F(1, 326) = 4.79, $p < .05$. The step utilizing gender and GEQ was not significant, $R^2 = .02$, adjusted $R^2 = .01$, F(1, 325) = 2.43, $p > .05$. The step utilizing all predictors was significant, $R^2 = .06$, adjusted $R^2 = .04$, F(2, 323) = 4.75, $p < .01$.

Separate multiple regression analyses were done by gender, beginning with males. Video game engagement was entered first, then online video game play and video game addiction. The individual predictor was not significant and neither was the step utilizing all predictors, $R^2 = .03$, adjusted $R^2 = .01$, F(2, 114) = 1.29, $p > .05$.

The same analysis was conducted for females. The step utilizing video game engagement was not significant, $R^2 = .00$, adjusted $R^2 = -.01$, F(1, 208) = 04, $p > .05$. The step utilizing all predictors was significant $R^2 = .05$, adjusted $R^2 = .04$, F(2, 206) = 3.52, $p < .05$. See Table 11 for results of the multiple regression.

Gender differences in habits and addiction. To further examine the differences between males and females in the total sample, several independent *t*-tests were conducted to identify differences in video game habits. There was no significant difference in playing video games on other devices for males ($n = 124$; $M = 1.33$, $SD = .47$) and females ($n = 212$; $M = 1.34$, $SD = .48$); $t(334) = -.26$, $p = .61$ There was a significant difference in hours spent playing video games per week with males ($n = 100$; $M = 8.89$, $SD = 8.88$) playing more than females ($n = 174$; $M = 3.11$, $SD = 4.96$); $t(272) =$

6.91, $p < .01$. There was also a significant difference in online game play between males ($n = 121$; $M = 1.31$, $SD = .46$) and females ($n = 213$; $M = 1.78$, $SD = .42$); $t(332) = -9.60$, $p < .01$. Additionally, a multivariate analysis of variance (MANOVA) was conducted to examine possible gender differences in video game and Internet addiction, as well as game engagement. The results of the MANOVA suggest that, in the present sample, there are significant gender differences in Internet addiction ($F (1, 330) = 5.39$; $p < .05$; partial $\varepsilon^2 = .02$) and game engagement ($F (1, 330) = 4.77$; $p < .05$; partial $\varepsilon^2 = .01$), but not in video game addiction ($F (1, 330) = .22$; $p = .64$; partial $\varepsilon^2 = .00$). With regard to differences on the Internet addiction measure, females ($M = 51.33$, $SD = 23.39$) had higher scores than males ($M = 45.24$, $SD = 22.31$). The converse was found on the game engagement measure as males ($M = 30.99$, $SD = 7.44$) had slightly higher scores than females ($M = 29.10$, $SD = 7.66$). In order to ensure that the distribution of the data did not impact these findings, a Mann-Whitney test was conducted among the three major study variables by gender. The same results were found such that for the Internet addiction measure, females had higher mean rank than males ($U = 10,627.5$, $p < .01$). For the game engagement measure, males had a higher mean rank than females ($U = 10,758$, $p < .05$). No difference was found for gender on the measure of video game addiction.

The Development of "Affected" Groups

One of the primary goals of the study was to examine possible relationships among various factors related to electronic media addiction. Therefore, "IAT-Affected" and "Video Game-Affected" groups were created to examine characteristics of individuals most likely to be considered Internet or video game- addicted. To note, there

were only six participants who met criteria for both the IAT-Affected and the Video
Game-Affected groups. Approximately 19.5% of the sample met the criteria to be
affected by Internet addiction and approximately 12.9% of the sample met the criteria to
be considered affected by video game addiction.

Characteristics of the IAT-Affected group. To identify those at greatest risk of
Internet addiction, the mean (49.13) and one standard deviation (23.14) from the overall
IAT score of the total sample were added. Based on this calculation, individuals who
received a score of 72 or above were considered to be "affected" by Internet use. Table
12 lists the means and standard deviations for key study variables in the overall IAT-
Affected sample.

Table 11

*Regression Analysis for the Prediction of Internet Addiction Among Females in the Total
Sample*

Model	Criterion	Predictor	ΔR^2	*B*	*SE B*	ß
1	IAT Total	GEQ Total	.00	.04	.21	.01
2	IAT Total	GEQ Total		.15	.21	.05
		Online game play		12.28	3.91	.22**
		PC/VGU Total	.05	-.85	.82	-.07

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

Table 12

Means and Standard Deviations for Major Study Variables in the IAT-Affected Sample

Variable	N	M (SD)	Range
IAT	67	87.85 (12.33)	72-119
GEQ	66	27.67 (8.28)	19-51
PC/VGU	64	27.72 (2.42)	22-42

Note. Possible range for IAT = 20 to 120; possible range for GEQ = 19 to 57; possible range for PC/VGU = 14 to 42.

Since gender was an important factor in the total sample analyses for the IAT-Affected group were conducted separately by gender. Table 13 displays the background information for the IAT-Affected sample for males. Table 14 presents the background information for the IAT-Affected sample for females.

Table 13

Background Information for Males, IAT-Affected Group

Variable	N	Percent
Ethnicity		
White/Caucasian	50	50.0%
African American	3	15.0%
Hispanic/Latino	2	10.0%
Asian/Pacific Islander	3	15.0%
Other	2	10.0%
Volunteer activities		
Yes	11	55.0%
No	9	45.0%

Favorite video game genre

Fighting	1	5.0%
First Person Shooter	7	35.0%
Action-Adventure	1	5.0%
Role-playing game	1	5.0%
Strategy	1	5.0%
Vehicle simulation	1	5.0%
Sports	6	30.0%
Puzzle games	1	5.0%
Other	1	5.0%

Plays video games on other devices

Yes	10	50.0%
No	10	50.0%

Plays video games online

Yes	11	55.0%
No	9	45.0%

Table 14

Background Information for Females, IAT-Affected Group

Variable	N	Percent
Ethnicity		
White/Caucasian	28	60.9%
African American	10	21.7%

Hispanic/Latino	2	4.3%
Asian/Pacific Islander	2	4.3%
Other	3	6.5%
Missing	1	2.2%
Volunteer activities		
Yes	19	41.3%
No	27	58.7%
Favorite video game genre		
Fighting	1	2.2%
First Person Shooter	6	13.0%
Action-Adventure	6	13.0%
Role-playing game	3	6.5%
Life simulation	5	10.9%
Strategy	5	10.9%
Vehicle simulation	2	4.3%
Sports	4	8.7%
Music games	2	4.3%
Puzzle games	3	6.5%
Other	6	13.0%
Missing	2	4.3%
Plays video games on other devices		
Yes	28	60.9%
No	18	39.1%

Plays video games online

    Yes   4   8.7%

    No   42   91.3%

Bivariate correlations were computed for key study variables in the total IAT-Affected sample (Table 15). Separate bivariate correlations were also computed for males (Table 16) and females (Table 17). For the total IAT-Affected sample, gender was associated with online game play, time spent playing video games was associated with online game play, and online game play was related to video game engagement.

Multiple regression analyses were conducted to identify predictors of Internet addiction within the IAT-Affected sample. Gender was entered in the first step, video game engagement was entered next, and finally online game play (yes or no) and PC/VGU score were entered. None of the individual steps were significant and neither was the step using all of the predictors, $R^2 = .05$, adjusted $R^2 = -.01$, $F(2, 59) = .80$, $p > .05$.

To further examine the differences between males and females in the IAT-Affected sample, several independent t-tests were conducted to identify differences in addiction and engagement. There was no significant difference on the Internet addiction measure for males ($n = 20$; $M = 87.65$, $SD = 11.55$) and females ($n = 46$; $M = 87.76$, $SD = 12.85$); $t(64) = -.03$, $p = .97$. There was no significant difference on the game engagement measure for males ($n = 20$; $M = 28.75$, $SD = 8.92$) and females ($n = 45$; $M = 26.67$, $SD = 7.29$); $t(63) = .99$, $p = .33$. There was also no significant difference on the

video game addiction measure between males (n = 20; M = 27.75, SD = 3.97) and

females (n = 44; M = 27.70, SD = 1.27); t(62) = .07, p = .95.

Characteristics of the Video Game-Affected Group

As with the IAT-Affected group, a "Video Game-Affected" group was created for

individuals who had higher scores on the PC/VGU. The mean (27.68) and one standard

deviation (2.46) were added to create the Video Game-Affected sample. Based on this, it

was determined that individuals who scored 30 or above on the PC/VGU comprised this

sample. Table 18 lists the means and standard deviations for the key study variables in

the overall Video Game-Affected sample.

Table 15

Correlations Among Major Study Variables for the Total IAT-Affected Sample

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Gender		-.10	-.25	.51**	-.12	.00	-.01
2. Other devices			-.04	.17	-.26*	.01	.15
3. Hours spent playing				-.50**	.32*	-.19	-.00
4. Play games online					-.34**	.07	.17
5. IAT						-.14	-.16
6. GEQ							.06
7. PC/VGU							

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

Table 16

Correlations Among Major Study Variables for IAT-Affected Males

Variable	*1*	*2*	*3*	*4*	*5*	*6*
1. Other devices		-.40	.50*	-.17	-.34	.35
2. Hours spent playing			-.35	-.23	.30	.14
3. Play games online				-.07	-.18	.19
4. IAT					.14	-.31
5. GEQ						.22
6. PC/VGU						

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

Table 17

Correlations Among Major Study Variables for IAT-Affected Females

Variable	*1*	*2*	*3*	*4*	*5*	*6*
1. Other devices		.16	.09	.09	-.25	-.07
2. Hours spent playing			-.57**	-.18	.36*	-.23
3. Play games online				.18	-.46**	.30
4. IAT					-.33*	-.05
5. GEQ						-.21
6. PC/VGU						

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

Table 18

Means and Standard Deviations for Major Study Variables in the Video Game-Affected

Sample

Variable	N	M (SD)	Range
IAT	45	45.18 (18.15)	20-89
GEQ	45	32.44 (8.05)	19-50
PC/VGU	45	31.71 (2.69)	30-42

Note. Possible range for IAT = 20 to 120; possible range for GEQ = 19 to 57; possible

range for PC/VGU = 14 to 42.

Analyses were also conducted separately by gender. Table 19 lists the background

information of the Video Game-Affected sample for males. Table 20 lists the background

information of the Video Game-Affected sample for females.

Table 19

Background Information for Males, Video Game-Affected Sample

Variable	N	Percent
Ethnicity		
White/Caucasian	11	64.7%
African American	3	17.6%
Asian/Pacific Islander	2	11.8%
Other	1	5.9%
Volunteer activities		
Yes	6	35.3%
No	11	64.7%
Favorite video game genre		

First Person Shooter	12	70.6%
Role-playing game	1	5.9%
Strategy	1	5.9%
Sports	1	5.9%
Other	2	11.8%
Plays video games on other devices		
Yes	10	58.8%
No	7	41.2%
Plays video games online		
Yes	13	76.5%
No	4	23.5%

Table 20

Background Information for Females, Video Game-Affected Sample

Variable	*N*	*Percent*
Ethnicity		
White/Caucasian	24	82.8%
African American	1	3.4%
Hispanic/Latino	1	3.4%
Asian/Pacific Islander	3	10.3%
Volunteer activities		
Yes	18	62.1%
No	11	37.9%

Favorite video game genre

    First Person Shooter   6   20.7%

    Action-Adventure   2   6.9%

    Role-playing game   2   6.9%

    Life simulation   3   10.3%

    Strategy   2   6.9%

    Sports   1   3.4%

    Music games   2   6.9%

    Puzzle games   5   17.2%

    Other   4   13.8%

    Missing   1   3.4%

Plays video games on other devices

    Yes   26   89.7%

    No   3   10.3%

Plays video games online

    Yes   7   24.1%

    No   21   72.4%

    Missing   1   3.4%

Bivariate correlations were computed for key study variables in the total Video Game-Affected group (Table 21). Separate bivariate correlations were conducted for males (Table 22) and females (Table 23). For the total Video Game-Affected sample, gender was correlated with playing games on other devices, hours spent playing video

games, online game play, and the video game addiction measure. There were no

significant correlations for males when considered alone; however, for females, hours

spent playing video games was associated with playing video games online.

Table 21

Correlations Among Major Study Variables for the Video Game-Affected Group

Variable	1	2	3	4	5	6	7
1. Gender		-.36*	-.46*	.50**	.04	-.15	-.33*
2. Other devices			.09	-.34*	.20	.18	.20
3. Hours spent playing				-.54**	-.10	.27	.29
4. Play games online					.00	-.19	-.06
5. IAT						.18	.06
6. GEQ							.14
7. PC/VGU							

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

Multiple regression analyses were conducted for the Video Game-Affected

sample. Gender was entered first, video game engagement was entered next, and finally

online game play or not and video game addiction were entered. None of the steps were

significant, including the step with all predictors entered, $R^2 = .04$, adjusted $R^2 = -.05$,

$F(2, 40) = .45$, $p > .05$.

Table 22

Correlations Among Major Study Variables for Males in the Video Game-Affected Group

Variable	1	2	3	4	5	6
1. Other devices		-.08	-.18	.25	.12	.17
2. Hours spent playing			-.03	-.11	.26	.31
3. Play games online				.06	.12	.17
4. IAT					.22	.16
5. GEQ						.11
6. PC/VGU						

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

Table 23

Correlations Among Major Study Variables for Females in the Video Game-Affected Group

Variable	1	2	3	4	5	6
1. Other devices		.02	-.16	.21	.16	-.09
2. Hours spent playing			-.59**	-.14	.27	-.12
3. Play games online				-.08	-.33	.09
4. IAT					.17	-.07
5. GEQ						.10
6. PC/VGU						

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

To further examine the differences between males and females in the Video Game-Affected sample, several independent *t*-tests were conducted to identify differences in addiction and engagement. There was no significant difference on the Internet addiction measure for males (*n* = 17; *M* = 44.24, *SD* = 20.63) and females (*n* = 29; *M* = 45.83, *SD* = 16.55); *t*(44) = -.29, *p* = .78. There was no significant difference on the game engagement measure for males (*n* = 17; *M* = 34.24, *SD* = 9.77) and females (*n* = 29; *M* = 31.79, *SD* = 7.04); *t*(44) = .98, *p* = .33. There was significant difference on the video game addiction measure suggesting that males (*n* = 17; *M* = 32.82, *SD* = 3.91) were more likely to report more symptoms of video game addiction in the Video-Game Affected sample than females (*n* = 29; *M* = 31.00, *SD* = 1.22); *t*(44) = 2.34, *p* < 05.

The Importance of a Preference for Violent Games

In the total sample and among the various subgroups, first person shooters were consistently the most popular genre when participants listed their favorite game. Three independent samples *t*-tests were conducted to determine if there were differences between individuals who prefer first person shooters compared to those who prefer other game genres on measures of addiction and engagement. There was no significant difference on scores on the IAT for those whose favorite game was a first person shooter (*M* = 46.35, *SD* = 22.24) and those whose favorite game belonged to another genre (*M* = 49.73, *SD* = 23.15); *t*(333) = 1.17, *p* = .93. There was no significant difference in the scores on the GEQ between those whose favorite game was a first person shooter (*M* = 30.57, *SD* = 7.34) and those whose favorite game was of another genre (*M* = 29.59, *SD* = 7.67); *t*(331) = -1.03, *p* = .59. There was also no significant difference on the PC/VGU between those whose favorite game was a first person shooter (*M* = 27.71; *SD* = 3.33)

and those whose favorite game was of another genre ($M = 27.66$, $SD = 2.12$); $t(106.84) = -.13$, $p = .90$. While not consistently the most popular genre, participants whose favorite game was classified as MMORPG were examined as well since these games can require extended periods of playtime and often involve violent content. Three independent samples t-tests were also conducted between individuals who prefer MMORPG's and those who do not. There was no significant difference identified on the IAT between those whose favorite game was an MMORPG ($M = 47.63$, $SD = 19.98$) and those whose favorite game was of another genre ($M = 48.97$, $SD = 23.18$); $t(333) = .28$, $p = .78$. There was also no significant difference on the PC/VGU between those whose favorite game was an MMORPG ($M = 27.05$, $SD = 2.38$) and those whose favorite game was of another genre ($M = 27.72$, $SD = 2.48$); $t(329) = 1.24$, $p = .22$. There was a significant difference for the GEQ for those whose favorite game was an MMORPG ($M = 34.96$, $SD = 7.36$) and those whose favorite game was of another genre ($M = 29.45$, $SD = 7.48$); $t(331) = -3.41$, $p < .01$. This suggests that individuals who prefer MMORPGs describe themselves as being more engaged in game-playing than those who prefer another type of genre.

Study 2

Preliminary Analyses

Study 2 examined characteristics of the linked parent/child dyads. Summary scores were computed for participant reports on the IAT (Internet Addiction Test), GEQ (Game Engagement Questionnaire), and PC/VGU (Pathological Computer/Video Game Use Questionnaire). Summary scores were normally distributed, linear, and no outliers were present. Reliability analyses were conducted for parents on the IAT (Cronbach's Alpha = .95), GEQ (Cronbach's Alpha = .90), and PC/VGU (Cronbach's Alpha = .43).

Reliability statistics were also computed for children on the IAT (Cronbach's Alpha = .93), GEQ (Cronbach's Alpha = .87), and PC/VGU (Cronbach's Alpha = .51). Table 24 presents the means and standard deviations on the key study variables for parents. Table 25 presents the means and standard deviations on the key study variables for children.

Table 24

Means and Standard Deviations for Major Study Variables for Parents

Variable	N	M (SD)	Range
IAT	19	55.32 (28.26)	18-108
GEQ	19	32.26 (8.25)	20-46
PC/VGU	19	27.47 (2.57)	21-32

Note. Possible range for IAT = 18 to 108; possible range for GEQ = 19 to 57; possible range for PC/VGU = 14 to 42.

Table 25

Means and Standard Deviations for Major Study Variables for Children

Variable	N	M (SD)	Range
IAT	17	57.53 (26.17)	19-108
GEQ	16	28.63 (7.26)	20-47
PC/VGU	16	28.63 (2.66)	23-33

Note. Possible range for IAT = 18 to 108; possible range for GEQ = 19 to 57; possible range for PC/VGU = 14 to 42.

Parents were also asked additional questions about their child's behavior and their own video game habits. When asked about whether or not their child's behavior changes during game play, 36.8% of parents indicated that their child's behavior did change.

Additionally, 42.8% of the parents indicated that they also played video games, but only one parent reported that they played video games online.

Primary Analyses

Correlations among major study variables. Bivariate correlations were computed separately for parents (Table 26) and children (Table 27) among key study variables. Children identified many more significant correlations than the parents (who were responding based on their perceptions of their child).

Table 26

Correlations Among Major Study Variables for Parents

Variable	1	2	3	4	5	6
1. Other devices		.32	-.34	-.08	.14	.01
2. Hours spent playing			-.51*	-.42	-.11	-.15
3. Play games online				.26	-.03	.31
4. IAT					.35	-.31
5. GEQ						-.21
6. PC/VGU						

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

Parent and child agreement on child's video game habits. The first area that was examined for agreement between parents and children was the genre of the child's favorite video game. Parents and children were asked to list the name of their child's favorite game as well as the genre of this game. Most children did not list the name of their favorite video game, but they did report a genre. For genre of child's favorite game,

there was 75% agreement between the parent and child. Of the parents who knew what

genre their child's favorite game belonged to, in 50% of the cases the video game was

violent. Parents and children were also asked to estimate how many hours per week the

child plays video games. Parent-child agreement was much lower for this question with

only 40% agreement.

Table 27

Correlations Among Major Study Variables for Children

Variable	1	2	3	4	5	6
1. Other devices		.48	-.19	.02	.68**	-.47
2. Hours spent playing			-.61*	-.18	.49	-.71**
3. Play games online				.42	-.31	.16
4. IAT					.19	-.13
5. GEQ						-.29
6. PC/VGU						

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

Parent-child agreement on addictive behaviors and engagement. Three

separate databases were created to measure parent and child agreement on the three major

study variables. Intraclass correlation coefficients were computed to examine parent and

child agreement for responses on the IAT, GEQ, and PC/VGU. Strong agreement was

identified for the IAT (Cronbach's Alpha = .959) and the GEQ (Cronbach's Alpha =

.930) while weaker agreement was found for the PC/VGU (Cronbach's Alpha = .645).

These results suggest higher parental awareness of children's Internet use and the child's

engagement; however, parental awareness of children's potential addictive behaviors with regard to video game use is much lower. Parent and child responses in Study 2 were further examined as several independent t-tests were conducted to identify differences in parents' and children's reports of behaviors indicating addiction and engagement. There was no significant difference on the Internet addiction measure for parents ($n = 19$; $M = 55.32$, $SD = 28.26$) and children ($n = 17$; $M = 57.53$, $SD = 26.17$); $t(34) = -.24$, $p = .81$. There was no significant difference on the game engagement measure for parents ($n = 19$; $M = 32.26$, $SD = 8.25$) and children ($n = 16$; $M = 28.63$, $SD = 7.26$); $t(33) = 1.37$, $p = .18$. There was also no significant difference on the video game addiction measure for parents ($n = 19$; $M = 27.47$, $SD = 2.57$) and children ($n = 16$; $M = 28.63$, $SD = 2.66$); $t(33) = -1.30$, $p = .20$.

With regard to children who could be considered affected by Internet and video game usage, the same criteria were established for the parent and child sample. Scores of 72 or above on the IAT and scores of 30 or above on the PC/VGU were used to indicate whether or not the child could meet criteria for addiction. On the IAT, four parents and children were in agreement that the child met criteria for Internet addiction. Furthermore, there were two children whose report indicated they met criteria but the parent did not and one parent whose report indicated that the child met criteria but not the child. On the PC/VGU, three parents and children were in agreement that the child met criteria for video game addiction. Furthermore, there were four children who felt they met criteria but the parent did not and two parents that felt the child met criteria but not the child.

Chapter 5

Discussion

The primary goal of the present study was to identify potential correlates and predictors of video game and Internet addiction. Adults reported on their habits and experiences. Some important relationships among video game addiction, Internet addiction, game engagement, and video game habits emerged in the total group, as well as for subgroups that could be considered at-risk for video game and Internet addiction. Gender also proved to be an important variable that identified with video game addiction, Internet addiction, game engagement, hours spent playing video games, and playing video games online. In addition, parent and child reports of the child's potentially addictive behaviors were obtained, and agreement between raters was examined. Results suggest that parents are aware of potentially addictive behaviors, such as Internet addiction and game engagement, but symptoms of video game addiction still are an area of disagreement, with children reporting more symptoms of addiction than parents.

Correlates of Addiction and Engagement

Although it was anticipated that significant relationships among video game addiction, Internet addiction, and game engagement would be identified, these relationships were not found. This finding is counter-intuitive given that these three variables share many similarities and past literature has demonstrated relationships among them. One explanation for this finding is that video game addiction, Internet addiction, and game engagement are three unique constructs that need to be examined separately; however, more research needs to be done to substantiate these findings. In

spite of the fact that the current study did not identify significant relationships among these variables, relationships with other study variables were identified.

Specifically, significant relationships were found between measures of addictive behaviors and specific video game habits. First, Internet addiction was significantly related to online video game play, a relationship that may seem intuitive. Within the sample considered to be at risk of Internet addiction, significant relationships were found between online game play, hours spent playing video games, and playing games on other devices. One reason for these relationships could be that online video game play offers extra elements above and beyond regular game play that include factors such as socialization, character development, and achievements to make the gaming experience more enticing, which possibly encourages more playing time. These relationships are also consistent with past research findings. For example, Chak and Leung (2004) found that dependent users of the Internet spent more time playing interactive online games and spending time in MUDs as opposed to other activities on the Internet. More recently, Montag, Flierl, Markett, Walter, Jurkiewiecz, and Reuter (2011) demonstrated that, within a sample of male online gamers, these players had significantly higher Internet addiction scores than participants recruited from the general population. A meta-analysis conducted by Kuss and Griffiths (2012) examining different aspects of Internet gaming addiction indicated that Internet gaming addiction was significantly related to more time spent playing video games online. These studies, as well as the present research, suggest that, at least for some, Internet addiction may be driven by online game play.

Significant relationships were also found between measures of addictive behaviors and game engagement. Within the total sample, greater video game

engagement was positively related to playing video games on other devices, hours spent playing video games, and online video game play. The most logical interpretation of this finding is that the availability of video games on computers, cell phones, handhelds, consoles and other such devices creates more opportunities for involvement in video games. The relationship between more hours spent playing video games and greater game engagement suggests that greater engagement could lead to players being more drawn to game playing and possibly to less control over the amount of time spent playing games. Video game engagement is still a relatively new concept within the video game addiction literature; however, the results of the present study are similar to those reported by Chou and Ting (2003) who found that online game players who reported deep engagement in video games spent more time playing video games than those who did not report deep engagement. Additionally, Seok and DaCosta (2012) found that in a sample of highly engaged versus non-engaged online game players, the highly engaged sample indicated that they would have a more difficult time quitting online gaming than the non-engaged sample. In addition to demonstrating a link between game engagement and desire to play video games, the present study also suggests a possible link between engagement and addictive Internet play.

Video Game Genre, Addiction, and Engagement

Separate analyses were conducted to examine characteristics of those whose favorite games belonged to the first person shooter and MMORPG genres. The results indicated that those whose favorite game belonged to the MMORPG genre were more likely to have higher scores on the game engagement measure than those participants whose favorite game was of another genre. This finding reflects the level of engagement

created by MMORPGs and also is consistent with past research that has found links

between MMORPGs and engagement (Skoric et al., 2009; Seok & DaCosta, 2012).

MMORPGs are "quest-driven games," meaning that in order to build your character up,

the player has to complete these quests with groups of people or on their own. It is very

difficult to progress in these games without devoting a significant amount of time to quest

completion. Additionally, these games can have character-specific items that are only

gained by chance so players may to complete the same quest multiple times in order to

gain the items they want.

Factors Predicting Internet Addiction

Video game addiction, game engagement, and video game habits were

hypothesized to be predictors of Internet addiction. The rationale for selecting video

game addiction as a predictor of Internet addiction was that many video games offer

online content related to the game to make them more appealing. For example, *Halo 4*

has the *Halo Waypoint* and *Call of Duty: Black Ops 2* has the *Call of Duty Elite* web sites

where players can record their gameplay and upload the videos for others to see. These

web sites also allow players to view special content to show how the games were

produced, download updates, and access game content, such as special map packs and

weapons, designed to enhance the gaming experience. Each of these games also offers

phone applications where one can access similar functions and actively change the look

and equipment of their video game characters. Obviously, Internet use increases when

video game players access related content after playing the video game either online or

off-line.

Regression analyses indicated that online video game play and female gender were predictors of Internet addiction. These results suggest that factors associated with online game play, such as those mentioned above, could influence the development of Internet addiction. The finding that female gender was a significant predictor of Internet addiction is discussed below with other important gender issues.

Gender, Game Habits and Preferences, and Game Behavior

Past research on gender issues in game-playing has indicated that males are more likely to play video games than females, and their games tend to contain violence (Gentile, Lynch, Ruh Linder, & Walsh, 2004; Gentile 2009). Furthermore, violent video games have been known to portray women in a negative manner. As mentioned previously, women in general are typically portrayed as weak, submissive, provocative, and less powerful than male characters (Ogletree & Drake, 2007; Miller & Summers, 2007). These factors are aspects of violent games that might deter female gamers from playing these types of games.

In the present study, differences between males and females were examined for several study variables. Males were identified as playing more video games online than females. This is consistent with past literature (Cole and Griffiths, 2007; Griffiths et al., 2004). For the total sample, among males, the most popular video game genres were first person shooters, sports, and MMORPGs. Among females, the most popular video game genres were first person shooters, action/adventure, and life simulation. It is possible that the female participants in this sample may not be representative of the general population. They may have been a special sample of female gamers who volunteered for the study because they were interested in the topic.

In past research, males are typically identified as playing video games much more frequently than females and being more susceptible to symptoms of video game addiction (Gentile, 2009; Gentile et al., 2012); however, this was not true for the participants in the total sample. Males reported stronger engagement in video games than females, yet there was no gender difference in video game addiction, possibly due to sample-specific characteristics of the females noted above. Females in the current study reported playing an average of three to four hours per week, which is actually lower than found in past research. Gentile (2009) reported that among a sample of children and adolescents, females played an average of about nine hours per week. A study of MMORPG players by Cole and Griffiths (2007) revealed that male gamers played an average of twenty-three hours per week and female gamers played an average of twenty-one hours per week. It is possible that participants in the current study could be underreporting their actual playing time, particularly since this relatively low time commitment is unlikely for the types of games females reported playing.

With regard to online game play, a majority of males indicated that they play video games online, while most females indicated that they do not play video games online. This was also true for the subset of males and females who could be considered at risk for video game and Internet addiction. However, in the regression analyses mentioned earlier, online game play was a predictor of Internet addiction for females but not for males. As noted earlier, it is possible that the females in the present study who play video games online may more closely resemble male gamers with respect to their game habits than they resemble females in the general population, and be at a greater risk of problematic game play. From an evolutionary perspective, psychologist Steven Pinker

(2002) highlights gender differences in his book *The Blank Slate: The Modern Denial of Human Nature*. He suggests that men and women have many basic similarities, such as in feeling basic emotions, but have important differences in other areas, such as physical strength and cognitive abilities. For example, at an early age, boys are more likely to spend time rehearsing violent conflict through play than girls. Presumably, this would translate to gender differences in play such as video games. Perhaps, for some women, playing video games offers a socially acceptable outlet to engage in aggressive behaviors.

Parent and Child Assessment of Behaviors

Study 2 examined parent and child agreement about child's video game habits, game engagement, and symptoms of video game and Internet addiction.

Correlations. Correlations between parent assessment of child's behavior identified a relationship between hours spent playing video games and online game play. This suggests that parents perceive that the more time their child spends playing video games, the more their child plays video games online. This relationship suggests that parents are willing to allow their child to play video games online and probably interact with other players. Furthermore, for children who play Xbox 360 and certain MMORPGs, parents are willing to pay for their child's subscriptions to play video games online or sign them up for the free services. Many of these online games are violent and there is no ratings system to monitor content that children are exposed to by other players. Parents who do not strictly monitor their child's game play and who have poor knowledge of monitoring devices available to them run the risk of having their child continually exposed to negative content. For example, in the current study, no children listed their favorite game but in one dyad, the parent listed the 9-year-old's favorite game

as *Call of Duty Black Ops* and both participants agreed on the genre. This game is rated "Mature" meaning it is appropriate for children ages seventeen and above. Other dyads agreed that the child's favorite genre is violent, even when the child was under the age of seventeen. These results reflect poor parental understanding of game content and/or lack of monitoring as young children in this study are allowed to play violent games and their parents acknowledged that they let their children play these games online.

Regarding engagement, similar to adult sample reports, child reports indentified positive relationships among game engagement, online game play, and hours spent playing video games. These relationships suggest that greater engagement in the game is related to more hours spent playing video games. In addition, online play is related to greater child engagement, according to parents' views. Children's responses also indicated a positive relationship between playing video games on other devices and higher scores on the game engagement measure. This relationship could signify a rise in the availability of video games on other devices, which offer child video game players more opportunities to become engaged in the games that they play. Children's reports also identified a relationship between symptoms of video game addiction and hours spent playing video games, which is a logical relationship.

Parent and child agreement. Parents and children showed strong agreement (75%) on the genre of their child's favorite video game. This result is an improvement on past research as parents in this sample seem to be more aware of the types of games that their children play than was demonstrated in past research. For example, Funk et al. (1999) reported that, when asked to name their child's favorite video game, most parents named an incorrect game or could not identify a favorite game. The present study did

find disagreement between parents and their child in the amount of time they spend playing video games. This is somewhat consistent with past research by Funk et al. (2009) that proved that parents' knowledge of appropriate screen time for children of different ages was poor.

To measure agreement, reliability of responses was obtained through intraclass correlations for parents and children on symptoms of video game and Internet addiction, and for perceived game engagement. Agreement was strong for symptoms of Internet addiction (Cronbach's Alpha = .96) and perceived degree of game engagement (Cronbach's Alpha = .93). These findings are important because the results suggest that parents made an accurate assessment of behaviors associated with their child's Internet usage and behaviors associated with how engaged children become in a video game during game play. Engagement and addiction are each defined by observable behaviors, but parents have to be cognizant of what a particular behavior signifies. If parents do not have correct information or are unaware about what behaviors their child displays, it may be extremely difficult to prevent or address addictive behaviors.

Disagreement was more evident between parents and children when assessing symptoms of video game addiction. These results are intriguing because of the similarity between parents and children's answers about behaviors associated with Internet addiction and game engagement. The different situation with video game addiction could be due to the fact that video game systems and portable devices are more likely to be in a child's room where they are more difficult to monitor. Gentile (2009) noted that children who meet criteria for video game addiction are more likely to have a video game system in their room than nonpathological gamers. This finding raises the issue of parental

awareness and knowledge about symptoms of addiction to technology. Helping parents to be better able to identify symptoms of video game addiction could give them ability to better intervene when problematic video game play surfaces.

Limitations (Study 1)

Some important limitations must be acknowledged for Study 1. Participants were given information about video games prior to completing the questionnaires. This included information about video game addiction. This information could have primed participants to respond in a certain way, perhaps to present themselves in a more favorable light. This may be reflected in the lower reliability of the video game addiction questionnaire, compared to the measure of Internet addiction and the game engagement measure. The reliability of the video game addiction measure in the present study is also considerably lower than reported in other research. In the current study, the measure's Cronbach's Alpha was .60. In research reported by Gentile et al. (2009), Cronbach's Alpha was .78 and in another recent study by Gentile et al. (2012) Cronbach's Alpha was .71 and .77 for the two waves of the study.

In addition, the majority of the participants in the study were recruited from a university undergraduate pool and diversity was also limited. Therefore the findings may not be generalizable to the greater population. With respect to the sample, participants were able to choose this study if they wanted to participate. Since the study came up on the research pool web site as a study about video games, participants interested in this topic likely took part and other possible participants may have been deterred. Working with a random sampling of participants, or a sample composed of a particular type of player, should be a goal of future research. A small number of the participants were also

bloggers on video game websites and this could have affected their responses given that these individuals likely play video games more than the general population.

Limitations (Study 2)

The primary limitation of the Study 2 was the extremely small sample size. The recruitment of linked parent child dyads proved to be very difficult, and this could have been impacted by the online format of the study since no researchers were there to answer questions about linking the data. This was evident in the data as some parents would complete a questionnaire, but then their child did not complete the corresponding questionnaire. Some parent and child questionnaires could not be linked because of participant error in the use of identification numbers. Future research might benefit from a less complicated method of assigning linking information.

The video game article was also given to participants in Study 2. Exposure would likely have produced the same priming effect for parents as it could have for adults in the first study and influenced parents' responses about their child for video game addiction. Additionally, some parents and children were only given one copy of the article and it is unclear if children actually read the article before giving it to their parents who completed the study first. In this case, viewing the article might not have impacted child responding but this was not proven.

A larger sample size would also be extremely important, as this would allow for more complex analyses. A larger sample would also help to ensure that the results could be generalized to the greater population. A more diverse sample should be recruited as 77.8% of this sample indicated that they were White/Caucasian. Few studies have focused on the ethnicity of gamers. Anderson et al. (2010) considered the cultural

makeup of gamers; however, this was done in the context of a meta-analysis. Future

researchers should strive for greater participant diversity. Additionally, the average

yearly income reported for parents in Study 2 was higher than the national average yearly

income. In Study 2, participant dyads came from a mix of private and public school

backgrounds so it is possible that this influenced their knowledge of their child's habits.

Conclusions

The current study has contributed to the literature on video game and Internet

addiction in several ways. Among females in this sample, online game play was a

significant predictor of Internet addiction and females were more likely than males to

exhibit more symptoms of Internet addiction. This finding is important because this

study identified a subsample of female game players that has been overlooked in the

literature. Furthermore, the present sample of female game players appears to be more

attracted to online gaming than typical females which may place them at an increased risk

to develop symptoms of Internet addiction. These findings call for additional research to

examine the types of games that female game players typically play online and what

features about these games places them at risk for Internet addiction.

Second, this study was the first to date to gather linked parent and child report and

measure agreement on the child's video game habits, symptoms of video game and

Internet addiction, and engagement. Although the parent-child sample was small, their

responses indicated that parents and children agreed on child symptoms of Internet

addiction and engagement, but disagreed on symptoms of video game addiction. This is

important because it suggests that some parents may not be monitoring their children's

video game play, risking potential addictive behavior. Finally, while much of the video

game addiction literature has focused on MMORPGs and addiction, in the present sample participants indicated a preference across many different genres, including first person shooters. This suggests the need to broaden the study of video game genres to determine which are most associated with addiction.

Future research on video game addiction should not simply focus on console and computer platforms. Video games are available on many platforms, and are more accessible and more portable than ever. People can play games on their phones, social media websites, and other forms of media. When games like *Farmville* were introduced on Facebook's web site, these gaming experiences allow members of the social media website to interact with others online while playing the game and recruit people to play the game with them. MMORPGs are also growing in popularity on iPhones and other mobile devices and players can interact with others and develop their characters on their phones. Players can transition seamlessly from playing on a console or computer at home to turning on their cell phone and downloading an application on their phone while waiting in line at a store. Multiple platforms and ease of Internet access allow players to experience video games anywhere we want, which increases the risk for those with a tendency to become addicted to video games or to the Internet.

Part of the appeal of video games is that they are enjoyable and, for many players, quite engaging. It is still unclear as to whether or not deep engagement in video games will lead to addictive behavior. In the present study, engagement was related to hours spent playing video games, playing games on other devices, and online game play. The role of factors such as video game genre, platform preference, and purpose for playing online games in encouraging addictive behaviors deserves further research attention. For

example, the social aspects of online video game play, the genre of the video game, character development, a desire to exert dominance over other players, and the gamer's perspective of their experience should all be studied as possible factors leading to Internet and/or video game addiction.

Although there is an expanding research base examining whether or not addiction to video games and the Internet are diagnosable conditions (Gentile, 2009; Gentile et al., 2011; Lemmens et al., 2011), this research is still in its infancy. However, there appears to be movement towards diagnostic status for video game addiction (Gentile, 2009; Gentile et al., 2011; Gentile et al., 2012). When video game and Internet addiction are examined through the lens of a behavioral addiction, a subset of video game players do show symptoms of addiction. While no clear-cut predictors of addiction were identified, the current research suggests that addiction to electronic media may result from a variety of technology-related experiences. Continuing to examine how video game play and Internet use can negatively affect the quality of a person's life when taken to excess will be important in understanding the development, assessment, and treatment of video game and Internet addiction.

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Appendix A

Background Questionnaire

1. Age _____   2. Gender ____ male ____ female

3. Grade in school _____

4. Household Income (yearly)
        ____ Under $10,000
        ____ $10,001 - $20,000
        ____ $20,001 - $30,000
        ____ $30,001-$40,000
        ____ $40,001-60,000
        ____ more than $60,000
        ____ don't know

5. Ethnicity
        ____ White/Caucasian
        ____ African American
        ____ Hispanic/Latino
        ____ Asian/Pacific Islander
        ____ Other (Please specify _____)

6. What is your favorite video game? _____

7. What genre does this video game belong to?
        _____ Fighting (Tekken, Street Fighter, etc.)
        _____ First Person Shooter (Halo, Call of Duty, etc.)
        _____ Action-Adventure (Resident Evil, Grand Theft Auto, etc.)
        _____ Role-Playing Game (World of Warcraft, Final Fantasy, etc.)
        _____ Construction Management Simulation (SimCity, etc.)
        _____ Life Simulation (The Sims, Nintendogs, etc.)
        _____ Strategy (Civilization, Starcraft, etc.)
        _____ Vehicle Simulation (Microsoft Flight Simulator, etc.)
        _____ Sports (Madden Series, NBA Live, etc.)
        _____ Music Games (Rock Band, Guitar Hero, etc.)
        _____ Puzzle Games (Tetris, Bejeweled, etc.)
        _____ Other (please specify) _____

8. How many hours a week do you spend playing video games on average?
        ____ no time   ____ 5-7 hours   ____ don't know
        ____ 1-2 hours   ____ 8-10 hours
        ____ 3-4 hours   ____ 11 or more hours

9. Do you play video games online (Xbox Live, MMORPG's, etc.)?
_____ Yes   _____ No

Appendix B

Internet Addiction Test Questionnaire

1. How often do you find that you stay online longer than you needed?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

2. How often do you neglect household chores to spend time online?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

3. How often do you prefer the excitement of the Internet to intimacy with your partner?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

4. How often do you form new relationships with fellow users on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

5. How often do others in your life complain to you about the amount of time you spend on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

6. How often do your grades or school work suffer because of the amount of time you spend on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

7. How often do you check your email before something else that you need to do?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

8. How often does your job performance or productivity suffer because of the Internet?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

9. How often do you become defensive or secretive when anyone asks what you do on-line?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

11. How often do you find yourself anticipating when you will go on-line again?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

12. How often do you fear that life without the Internet would be boring, empty, and joyless?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

13. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

14. How often do you lose sleep due to late-night log-ins?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

16. How often do you find yourself saying "just a few more minutes" when on-line?

       Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

17. How often do you try to cut down the amount of time you spend on-line and fail?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

18. How often do you try to hide how long you've been on-line?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

19. How often do you choose to spend more time on-line over going out with others?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

20. How often do you feel depressed, moody, or nervous when you are off-line, which goes away when you are back on-line?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

Appendix C

Game Experience Questionnaire

For each question, mark the response that best describes how you **USUALLY** feel **while you are playing a video or computer game.**

While I am playing, sometimes

1. I lose track of time

No	Sort of	Yes
1	2	3

2. Things seem to happen automatically

No	Sort of	Yes
1	2	3

3. I feel different

No	Sort of	Yes
1	2	3

4. I feel scared

No	Sort of	Yes
1	2	3

5. The game feels real

No	Sort of	Yes
1	2	3

6. If someone talks to me, I don't hear them

No	Sort of	Yes
1	2	3

7. I get wound up

     No   Sort of   Yes

     1   2   3

8. Time seems to kind of stand still or stop

     No   Sort of   Yes

     1   2   3

9. I feel spaced out

     No   Sort of   Yes

     1   2   3

10. I don't answer when someone talks to me

     No   Sort of   Yes

     1   2   3

11. I can't tell that I'm getting tired

     No   Sort of   Yes

     1   2   3

12. Playing seems automatic

     No   Sort of   Yes

     1   2   3

13. My thoughts go fast

     No   Sort of   Yes

     1   2   3

14. I lose track of where I am

      No   Sort of   Yes

      1   2   3

15. I play without thinking about how to play

      No   Sort of   Yes

      1   2   3

16. Playing makes me feel calm

      No   Sort of   Yes

      1   2   3

17. I play longer than I meant to

      No   Sort of   Yes

      1   2   3

18. I really get into the game

      No   Sort of   Yes

      1   2   3

19. I feel like I just can't stop playing

      No   Sort of   Yes

      1   2   3

Appendix D

Pathological Computer/Video Game Use Questionnaire

1. During the past year, have you become more preoccupied with playing video games, studying video game playing, or planning the next opportunity to play?

        Yes   **No**   **Sometimes**

2. In the past year, do you need to spend more and more time and/or money on video games in order to achieve the desired excitement?

        Yes   **No**   **Sometimes**

3. In the past year, have you sometimes tried to limit your own playing?

        Yes   **No**   **Sometimes**

3a. If yes or sometimes, are you successful in limiting yourself?

        Yes   **No**   **Sometimes**

4. In the past year, have you become restless or irritable when attempting to cut down or stop playing video games?

        Yes   **No**   **Sometimes**

5. In the past year, have you played video games as a way of escaping from problems or bad feelings?

        Yes   **No**   **Sometimes**

6. In the past year, have you ever lied to family or friends about how much you play video games?

        Yes   **No**   **Sometimes**

7. In the past year, have you ever committed illegal/unsocial acts such as theft from family, friends, or elsewhere in order to get video games?

        Yes   **No**   **Sometimes**

8. In the past year, have you ever neglected household chores to spend more time playing video games?

        Yes   **No**   **Sometimes**

9. (For students) In the past year, have you ever done poorly on a school assignment or test because you spent too much time playing video games? (For non-students) In the past year, has your work ever suffered (e.g., postponing things, not meeting deadlines, being too tired to function well, etc.) because you spent too much time playing video games?

        Yes   **No**   **Sometimes**

10. In the past year, have you ever needed friends or family to help you financially because you spent too much money on video game equipment, software, or game/Internet fees?

        Yes   **No**   **Sometimes**

Video Game Usage in Adults, Participate in Research and Get Answers.

Most studies examining video game usage have focused on children and adolescents since they are the largest demographic of video game players. About 92% of children between the ages of 2-17 play video games, which is approximately 59 million players. However, this does not include adult video game players, and it seems clear that video games are popular with players of all ages. Some players play several hours pretty much every day, and more information is needed about play patterns, especially in adults.

There is a growing concern about whether or not frequent video game play could really be an addiction, similar to addictions to drugs or gambling. In some cases, a heavy commitment to playing video games has had serious negative consequences. For example, in 2002 a 27-year-old man in Taiwan collapsed and died in an Internet café after playing video games for 32 hours without a break. In 2009, a teenager in Ohio who was said to be "dangerously addicted" to video games was convicted of murder after shooting his mother and father because the mother took away his copy of the violent video game, *Halo 3*. These are extreme and fortunately rare examples, but they tell us that it is important to study and understand the phenomenon of intense commitment to gaming.

Below this paragraph is a link to a study about video game addiction. Please follow the link and complete the questionnaire. We believe that it will take most people about 30 minutes to complete the questionnaire. Your help with this research is very important to understanding video game addiction in the general population. To thank you for your help, participants will be entered into a drawing to receive one of three $25 gift certificates to Target.

Below is the link to the questionnaire as well as additional links to web sites for information about the diagnosis and treatment of video game addiction if you are concerned about yourself, a friend, or a family member. The results of our study will be made available to you if you would like them when it has been completed.

Study Questionnaire:

https://www.psychdata.com/s.asp?SID=135682

Video Game Addiction Website:

http://www.netaddictionrecovery.com/

Is Your Child Addicted to Video Games?
Participate in Research and Get Answers.

Did you know that 92% of children between the ages of 2-17 play video games, which is approximately 59 million players? Time commitment varies, but we know that some players play several hours pretty much every day.

Among frequent players, it is still unclear how many are actually addicted to video games. There is a growing concern about whether frequent video game play could really be an addiction, similar to addictions to drugs or gambling. In some cases, a heavy commitment to playing video games has had serious negative consequences. For example, in 2002 a 27-year-old man in Taiwan collapsed and died in an Internet café after playing video games for 32 hours without a break. In 2009, a teenager in Ohio who was said to be "dangerously addicted" to video games was convicted of murder after shooting his mother and father because the mother took away his copy of the violent video game, *Halo 3*. These are extreme and fortunately rare examples, but they tell us that it is important to study and understand the phenomenon of intense commitment to gaming.

We currently have no information about how well-informed parents are about the intensity of their child's video game play. If many parents are not well-informed, then that could be a significant public health issue. Below this paragraph there are links (one for parents and one for children) to a study looking at issues about children's involvement in video games. Please follow the link for the appropriate category and complete the questionnaire. Then we would like you to choose one of your children who is between the ages of 8 and 17, and who plays video games most often. After parents complete their questionnaire, they will be given an ID number. It is important that you write this number down and then enter it into your child's questionnaire when they complete it. This will allow us to match responses between the questionnaires so that we can determine how well-informed parents are about their children's video game habits. We believe that it will take most parents about 30 minutes to complete the questionnaire. Children may take a little longer, depending on their age. Your help with this research is very important to understanding video game addiction in children. To thank you for your help, participants will be entered into a drawing to receive one of three $25 gift certificates to Target.

Below are the links to the questionnaire as well as additional links to web sites for information about the diagnosis and treatment of video game addiction if you are concerned about your child. The results of our study will be published here at education.com when it has been completed.

<u>Study Questionnaires:</u>

- Parent Questionnaire: https://www.psychdata.com/s.asp?SID=135686

- Child Questionnaire: https://www.psychdata.com/s.asp?SID=135715

<u>Video Game Addiction Websites:</u>

http://www.mediafamily.org/vga/index.shtml

http://www.netaddictionrecovery.com/

Appendix G

Background Questionnaire – Parent

**IF YOU HAVE MORE THAN ONE CHILD, ANSWER ALL QUESTIONS
ABOUT THE SAME CHILD. CHOOSE THE CHILD BETWEEN AGE 8 AND 17
WHO PLAYS VIDEO GAMES MOST OFTEN**

1. Age of child _____   2. Gender ____male ____ female

3. Grade in school _____

4. Household Income (yearly)
      ____ Under $10,000
      ____ $10,001 - $20,000
      ____ $20,001 - $30,000
      ____ $30,001-$40,000
      ____ $40,001-60,000
      ____ more than $60,000
      ____ don't know

5. Ethnicity
      ____ White/Caucasian
      ____ African American
      ____ Hispanic/Latino
      ____ Asian/Pacific Islander
      ____ Other (Please specify _____)

6. What is your child's favorite video game? _____

7. What genre does this video game belong to?
      _____ Fighting (Tekken, Street Fighter, etc.)
      _____ First Person Shooter (Halo, Call of Duty, etc.)
      _____ Action-Adventure (Resident Evil, Grand Theft Auto, etc.)
      _____ Role-Playing Game (World of Warcraft, Final Fantasy, etc.)
      _____ Construction Management Simulation (SimCity, etc.)
      _____ Life Simulation (The Sims, Nintendogs, etc.)
      _____ Strategy (Civilization, Starcraft, etc.)
      _____ Vehicle Simulation (Microsoft Flight Simulator, etc.)
      _____ Sports (Madden Series, NBA Live, etc.)
      _____ Music Games (Rock Band, Guitar Hero, etc.)
      _____ Puzzle Games (Tetris, Bejeweled, etc.)
      _____ Other (please specify) _____

8. How many hours a week does your child spend playing video games on average?

____ no time	____ 5-7 hours	____ don't know
____ 1-2 hours	____ 8-10 hours	
____ 3-4 hours	____ 11 or more hours	

9. Does your child play video games online (Xbox Live, MMORPG's, etc.)?

_____ Yes   _____ No

Appendix H

Internet Addiction Test Questionnaire - Parent

1. How often do you find that your child stays online longer than needed?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

2. How often does your child neglect household chores to spend time online?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

3. How often does your child form new relationships with fellow users on-line?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

4. How often do others in your life complain to you about the amount of time your child spends on-line?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

5. How often does your child's grades or school work suffer because of the amount of time he/she spends on-line?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

6. How often does your child check their email before something else that they need to do?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

7. How often does your child become defensive or secretive when anyone asks what he/she does on-line?

> Rarely Occasionally Frequently Often Always Does Not Apply
> (1) (2) (3) (4) (5)

8. How often does your child block out disturbing thoughts about their life with soothing thoughts of the Internet?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

9. How often does your child find him/herself anticipating when he/she will go on-line again?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

10. How often does your child fear that life without the Internet would be boring, empty, and joyless?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

11. How often does your child snap, yell, or act annoyed if someone bothers him/her while on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

12. How often does your child lose sleep due to late-night log-ins?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

13. How often does your child feel preoccupied with the Internet when off-line, or fantasize about being on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

14. How often does your child find him/herself saying "just a few more minutes" when on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

15. How often does your child try to cut down the amount of time he/she spends on-line and fail?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

16. How often does your child try to hide how long he/she has been on-line?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

17. How often does your child choose to spend more time on-line over going out with others?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

18. How often does your child feel depressed, moody, or nervous when he/she is off-line, which goes away when he/she is back on-line?

Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
(1)   (2)   (3)   (4)   (5)

Appendix I

Internet Addiction Test Questionnaire - Child

1. How often do you find that you stay online longer than you needed?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

2. How often do you neglect household chores to spend time online?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

3. How often do you form new relationships with fellow users on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

4. How often do others in your life complain to you about the amount of time you spend on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

5. How often do your grades or school work suffer because of the amount of time you spend on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

6. How often do you check your email before something else that you need to do?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

7. How often do you become defensive or secretive when anyone asks what you do on-line?

    Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
     (1)   (2)   (3)   (4)   (5)

8. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

9. How often do you find yourself anticipating when you will go on-line again?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

10. How often do you fear that life without the Internet would be boring, empty, and joyless?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

11. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

12. How often do you lose sleep due to late-night log-ins?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

13. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

14. How often do you find yourself saying "just a few more minutes" when on-line?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

15. How often do you try to cut down the amount of time you spend on-line and fail?

        Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
         (1)   (2)   (3)   (4)   (5)

16. How often do you try to hide how long you've been on-line?

      Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

17. How often do you choose to spend more time on-line over going out with others?

      Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

18. How often do you feel depressed, moody, or nervous when you are off-line, which goes away when you are back on-line?

      Rarely   Occasionally   Frequently   Often   Always   Does Not Apply
        (1)   (2)   (3)   (4)   (5)

Appendix J

Game Experience Questionnaire – Parent

For each question, mark the response that best describes how your child **USUALLY** feels **while he/she is playing a video or computer game.**

While my child is playing, sometimes

1. He/She loses track of time

No	Sort of	Yes
1	2	3

2. Things seem to happen automatically

No	Sort of	Yes
1	2	3

3. He/She feels different

No	Sort of	Yes
1	2	3

4. He/She feels scared

No	Sort of	Yes
1	2	3

5. The game feels real

No	Sort of	Yes
1	2	3

6. If someone talks to him/her, he/she does not hear them

No	Sort of	Yes
1	2	3

7. He/She gets wound up

No	Sort of	Yes
1	2	3

8. Time seems to kind of stand still or stop

No	Sort of	Yes
1	2	3

9. He/She feels spaced out

No	Sort of	Yes
1	2	3

10. He/She does not answer when someone talks to him/her

No	Sort of	Yes
1	2	3

11. He/She can't tell that he/she is getting tired

No	Sort of	Yes
1	2	3

12. Playing seems automatic

No	Sort of	Yes
1	2	3

13. His/her thoughts go fast

No	Sort of	Yes
1	2	3

14. He/She loses track of where he/she is

      No   Sort of   Yes

      1   2   3

15. He/She plays without thinking about how to play

      No   Sort of   Yes

      1   2   3

16. Playing makes him/her feel calm

      No   Sort of   Yes

      1   2   3

17. He/She play longer than he/she meant to

      No   Sort of   Yes

      1   2   3

18. He/She really gets into the game

      No   Sort of   Yes

      1   2   3

19. He/She feels like he/she just can't stop playing

      No   Sort of   Yes

      1   2   3

Appendix K

Pathological Computer/Video Game Use Questionnaire - Parent

1. During the past year, has your child become more preoccupied with playing video games, studying video game playing, or planning the next opportunity to play?

        Yes   **No**   **Sometimes**

2. In the past year, does your child need to spend more and more time and/or money on video games in order to achieve the desired excitement?

        Yes   **No**   **Sometimes**

3. In the past year, has your child sometimes tried to limit his/her own playing?

        Yes   **No**   **Sometimes**

3a. If yes or sometimes, was your child successful in limiting him/herself?

        Yes   **No**   **Sometimes**

4. In the past year, has your child become restless or irritable when attempting to cut down or stop playing video games?

        Yes   **No**   **Sometimes**

5. In the past year, has your child played video games as a way of escaping from problems or bad feelings?

        Yes   **No**   **Sometimes**

6. In the past year, has your child ever lied to family or friends about how much he/she plays video games?

        Yes   **No**   **Sometimes**

7. In the past year, has your child ever committed illegal/unsocial acts such as theft from family, friends, or elsewhere in order to get video games?

        Yes   **No**   **Sometimes**

8. In the past year, has your child ever neglected household chores to spend more time playing video games?

       Yes   **No**   **Sometimes**

9. In the past year, has your child ever done poorly on a school assignment or test because he/she spent too much time playing video games?

       Yes   **No**   **Sometimes**

10. In the past year, has your child ever needed friends or family to help him/her financially because he/she spent too much money on video game equipment, software, or game/Internet fees?

       Yes   **No**   **Sometimes**