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Social and emotional aspects of World of Warcraft players

SOCIAL AND EMOTIONAL ASPECTS OF WORLD OF WARCRAFT PLAYERS

GARRET FORD

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GARRET FORD

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Dr. J. Sanders Thesis Supervisor	Assistant Professor	Ph.D.
Dr. B. Lee Thesis Examination Committee Member	Associate Professor	Ph.D.
Dr. T. Leighton Thesis Examination Committee Member	Assistant Professor	Ph.D.
Dr. D. Christensen External Examiner University of Lethbridge Lethbridge, Alberta	Assistant Professor	Ph.D.
Dr. G. Tzu Chair, Thesis Examination Committee	Associate Professor	Ph.D.

Dedication

Thank you to my Mother,

Goodbye to my Alma Mater,

And to all the Children…

CONGRATULATIONS.

Abstract

This quantitative research thesis investigated the social and emotional aspects of World of Warcraft (WOW) players through the use of an online survey. The sample consisted of 374 online survey respondents of which 215 were used in final data analysis. The survey investigated demographics, gameplay habits, social anxiety, anxiety, depression, loneliness, and self-esteem. A binary logistic regression found that class specialization, hours played, social anxiety severity, and depression severity were predictive of internet gaming disorder (IGD). A univariate Analysis of Variance (ANOVA) found there was significant interaction effects between the constructs of depression, anxiety, social anxiety, and IGD. The results suggest that IGD is not wholly influenced by a specific disorder but instead by the person's mental health in general, however, social anxiety was significantly associated after accounting for interaction effects. The researcher concluded that treatment of IGD requires attention to comorbid social and emotional aspects and the ecosystem of comorbidity in which they exist.

Acknowledgments

To James Sanders, your patient guidance and benevolence allowed me to complete this epic undertaking. You are an excellent supervisor and mentor. Thank you.

To Metric, for being the soundtrack to my Masters.

To Blizzard Entertainment, the research participants, and my fellow players.

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Introduction

Research Path

This quantitative cross-sectional research thesis examines the emotional and social aspects of World of Warcraft (WOW) players. Research was conducted using an online survey which contained measures for: demographics, gameplay, internet gaming disorder (IGD), depression, loneliness, self-esteem, generalized anxiety, and social anxiety.

The Entertainment Software Rating Board (ESRB) estimated that 25% of gamers are under 18 and 49% are within the 18-49 age range (2014). While primarily considered a male past time it is estimated that 40% of gamers are female as well (ESRB, 2014). Video games are a popular hobby but problematic gameplay is a hazard for some players. Griffiths, Király, Pontes, and Demetrovics, (2015) examined 33 studies and found that problematic gaming prevalence ranged from 0.2% to 34%; this variation was attributed to the different populations and measures used.

Problematic video game play has been studied using a variety of measures prior to the creation of IGD. Grusser, Thalemann, and Griffiths (2007) studied 7069 individuals and 840 players were found to meet their criteria for an addictive disorder. This study found that 11.9% of players could be counted as addicted to video games according to their measure (Grusser, et al. 2007). Grusser et al., (2007) concluded that while the percentage seemed high the participants were active members of an online gaming magazine and the high engagement of the sample may have contributed to the prevalence.

Byrne (2014) studied 5313 WOW players and how multiple factors such as ethnicity, age, gender, perception of gaming problem, and hours of play were connected

to disordered play. Byrne (2014) found that 61% of their sample had abnormal gaming use. Byrne (2014) found that the players' score had a weak correlation with their age and hours played. Byrne (2014) found that the self-perception of problematic gaming reflected their score on the test, meaning that individuals whose score indicated problematic internet use were aware of their problem. Byrne (2014) suggested further study on the benefits and pitfalls of gaming so that clinicians can better understand individuals entering treatment.

Massively multiplayer online roleplaying games (MMORPG) are of interest in the study of problematic game play due to the reputation of this game type for being problematic both anecdotally and in research. WOW has a degree of notoriety as being addictive; www.wowaholics.com is a website where players share their stories of addiction to the game, there are various YouTube videos of players deleting their characters while talking about how the game had ruined their lives through addiction, and news articles about players lamenting their addiction to the game (Simper, 2013). Another past MMORPG that had a reputation for being addictive was Everquest (1999) which was the subject research on problematic game play (Taylor & Taylor, 2010). Scientific evidence suggests that this may be an undeserved reputation as Kim et al., (2016) found that despite this poor reputation that the RPG game type was played the least by their disordered gaming risk group.

IGD criteria was developed in 2013 for the release of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by the American Psychiatric Association (APA); the criteria for IGD was included in Section-III for disorders requiring additional study (APA, 2013). For this research IGD was the

construct used to represent the concepts of problematic gameplay and video game addiction. The current prevalence of IGD is not clear and ranges from less than 1% to 10% depending on the sample and measures used (Kim et al., 2016). As discussed by Griffiths et al., (2015) and Kim et al., (2016) there is a lack of consensus among measures for this disorder which contributes to the variety in prevalence estimates. Kim et al. (2016) pointed out that most studies of IGD have been focused on non-adult samples which limits data on this subject. Griffiths et al. (2016) discussed that the bias towards non-adult samples in the study of IGD is perhaps due to the reluctance of adults to seek help or that children and adolescents are more likely to be pushed into treatment by concerned parents.

Petry and O'Brien (2013) explained their concerns surrounding the disorder's inclusion in the DSM-5, but acknowledged that the people suffering from problematic play would benefit from any treatment methods that appear due to its inclusion. Griffiths et al. (2014) discussed the need for further research and development on IGD and understanding it. Dowling (2014) found numerous problems with the current inclusion of IGD in the DSM-5, however, they acknowledged that further empirical testing is required to determine whether the diagnosis should be included in later editions.

Video game play is the use of electronic games for entertainment in a recreational and non-disordered fashion. IGD is different from video game play because of the detrimental effects it has on the person’s functioning. According to the DSM-5 IGD is defined by a “persistent and recurrent use” of internet based games leading to clinically significant problems (APA, 2013). The DSM-5 listed nine criteria of which five or more are required to receive a diagnosis of IGD (APA, 2013). The disturbance must be within

a 12-month period and does not include gambling or problematic internet use regarding social networking, pornography, and other non-gaming sites (APA, 2013).

World of Warcraft

WOW is a MMORPG with millions of players and was released in 2004 (Statista, 2014). The game features players interacting with each other within a fantasy world via avatars. Players are encouraged to cooperate and compete with each other. Player progression is measured through multiple levels which are determined by the accumulation of experience points and items which increase the characters' power. Wealth is measured through the accumulation of in-game currency which includes gold, silver, and copper pieces.

WOW possesses four different server types: player versus player (PVP), role-playing (RP), role-playing player versus player (RPPVP), and normal. The PVP servers are where players are expected to be always ready for combat with others players and the emphasis of game play is of a competitive nature. The RP servers emphasizes role-playing where the player is expected to act and speak as their avatar would and naming conventions are enforced so that there is a greater degree of fantastic verisimilitude. The RP server is less popular than Normal and PVP evidenced by the fewer number of servers and lower numbers of players per server devoted to this play style (Warcraft Realm, 2016). The RPPVP server combines the aspects of the RP server and PVP server and is a unique although somewhat less popular play environment as evidenced by the small number of players who engage in this play style (Warcraft Realm, 2016). Normal servers lack special rules regarding player engagement in combat and role-playing and are among

the most popular (Warcraft Realm, 2016). These four server types appeal to different types of players and provide unique experiences of the games environment.

The popularity of WOW has created numerous works of gray literature on the matter which includes all manner of sociological critiques of the constructs within WOW (Corneliussen and Rettberg, 2008). The book by Bainbridge (2010) likens the evolution and development of WOW to be a parallel civilization, if not for the population but for the social environment where millions of players interact within.

WOW has been studied by multiple scholars for a variety of reasons. Herodotou, Kambouri, and Winters (2013) used a sample of 1298 WOW players to determine whether or not most players were socially dissatisfied. They found that the players studied engaged in the online game because they enjoyed social interactions and not because they were socially isolated. Kwok, Wing, and Khoo (2013) studied 128 WOW players and examined their motivations for playing the game. Kwok et al. (2013) found that intrinsic and extrinsic achievement motivators were connected to problematic play. Kwok et al. (2013) found that achievement orientation and internal regulation of reward both positively predicted problematic play in the sample.

Research objective and questions. The research objective was to study the social and emotional aspects of WOW players and provide information on the IGD. This research thesis answered the following research questions:

What are the game-play characteristics of WOW players? This research question has been selected to investigate the population's demographics, but rather that focusing upon the age and gender of the sample it was tailored to look at the particular constructs found in the game. This data is important to gather as it will give a snap shot of the hours

of play, server choice, class specialization choice, and other details of the gamers. Simple descriptive statistics were selected to analyze this question.

What game-play factors and social and emotional characteristic predict IGD? This research question has been selected to investigate whether the chosen variables are predictive of IGD. The variables include guild membership, class specialization, hours of play, age of start, current age, gender, marital status, depression, anxiety, SAD, loneliness, all in relation to IGD. Binary logistic regression- forward stepwise was used to determine which variables were predictive of IGD.

What comorbid factors impact players with IGD? This research question has been selected to investigate the influence and interaction between different selected variables which included; depression, anxiety, SAD, and IGD. The methodology of analysis for this question is the univariate Analysis of Variance (ANOVA). This methodology will determine the influence of variables between each other.

Section Summary

This chapter introduced the topic of research and details surrounding it. This chapter discussed the following; population of study, prevalence estimates, information regarding WOW, and the development of the IGD diagnosis criteria. This chapter presented the research questions which were the focus of the study.

Literature Review

Introduction

This chapter discusses the following topics; history and development of console based games (CBG) and internet based games (IBG), the particular parameters of the MMORPG and WOW, the different potential hazardous consequences of IGD and studies that have analyzed them before, the components model of addictions as proposed by Griffiths (2005), and loss of control as the defining feature of addiction.

Video Game History

Video games have become ubiquitous in our culture by shifting from arcades, to the home, and now appearing on mobile phones. There are two main types of gaming that will be discussed in this literature review; the CBG and the IBG. The IBG is a game that is played using the internet and encourages interaction with other players. The CBG is played offline and often is a solitary activity though multi-player forms exist.

Game evolution: Arcades to MMORPGs. The feverish pace that video games have evolved is a testament to their popularity; from Nolan Bushnell's Ur-arcade machine *Computer Space* (1971) (Kent, 2001); to the primitive one-dimensional world of *Berzerk* (1980) which was connected to the first video game use related death (Kiesling, 1982); to today where the player can personalize an avatar and interact with others over the internet in 3D environments. Console based games (CBG) were the first type of video games available to the consumer market and were played exclusively offline, though were not necessarily single player as local and network play did exist. As technology advanced so did the capabilities of the CBG as they featured more complex and innovative experience. The first leap forward in CBG occurred with the advent the first home systems like the

Magnavox Odyssey (1972) (Kent, 2001). The second leap for CBG occurred with the rise of Atari which brought the CBG to the mainstream, an innovation which was so successful that Nolan Bushnell would later sell Atari to Warner Communications for nearly $28 Million USD (Kent, 2001). Eventually a company by name of Nintendo created the Japanese Famicom (1984) and later released the same system in North America as the Nintendo Entertainment System (1985) (Kent, 2001). Companies began to seek out the next large leap forward and this gave rise to a virtual arms race to create games that were more immersive, this was called the Console Wars. Today gaming systems have aesthetic differences but are largely the same with no quantum leaps in innovation since the rise of the IBG. There is growing popularity in virtual reality technology and alternate reality games, such as Pokemon Go, which may provide new innovations in gaming.

In the infancy of the internet based game (IBG) the costs of internet access were relegated to the rich or dedicated, as the price of two hours of IBG time could cost up to $50 (Barton, 2008). As technology advanced and access to the internet became affordable, the dark age of IBG came to an end. IBG have many sub-types, however, they feature a connection to the internet which allows competition or cooperation between users which is emphasized by the games design. Today players are able to enjoy IBG from multiple platforms such as gaming platforms (Xbox, Playstation), cellular phones, and personal computers.

MMORPG properties. The MMORPG has features that sets it apart from other game types. The emphasis on simultaneously hosting massive amounts of players online within the context of a role-playing game world. The game servers must keep track of the

character over time and their accomplishments. This was a technological impossibility in the early days of gaming due limitations of bandwidth and computer memory. Today entire online communities exist and interact with each other in cooperation and competition. In an MMORPG the player interacts with their environment through the use of an Avatar or a user created representation for themselves within the game world. These avatars give the player a personal connection to the game world because they personalize their appearance, equip them with items, and follow the story as the avatar changes over time.

There are many motivational factors for playing MMORPG though the key points of interest are; that players enjoy achieving goals within an environment, being supported by social interactions, and using a character that they identify with (Taylor & Taylor, 2010). It was found that the social components of interacting with similar peers was the main reason for play (Taylor & Taylor, 2010).

MMORPG social interaction. Social interaction is the essential core of the MMORPG that sets it apart from traditional CBG role playing games such as Final Fantasy 7 (1997). The MMORPG Guild Wars (NCSOFT, 2005) utilizes a variety of player interactions such as: cooperating to kill boss monsters; fighting each other in guild versus guild battles; or trading in virtual settlements. Eve Online (CCP Games, 2003) focused almost entirely on player versus player combat and driving the in-game economy through real world currency exchange.

Social consequences can occur from problematic gaming including lost friendships, divorces, family, neglect of important family commitments, and relationship discord (Hartmann, Jung, & Vorderer, 2012). The severity of the disconnection varies

though perhaps the most extreme example of this social disconnection being the Korean case where parents neglected a child until death while taking care of a virtual child in a MMORPG (Gamepolitics, 2010).

Isolation can become so severe that the player endangers their social networks. For instance, a phenomenological study by Chappell, Virginia, Davies, and Griffiths (2006) recorded accounts from Everquest (1999) online forums discussing their own excessive game-play, or alternatively spouses voicing concerns about their partners gaming habits. One such forum was found titled "Widows of EQ (Everquest) players" (Chappell, et al. 2006), a name which speaks volumes to the isolation and alienation felt by spouses of those suffering from video game addiction. Chappell, et al. (2006) found accounts of twelve individuals who were in various stages of playing Everquest (1999). These different user narratives about their experiences of problematic game play painted very stark images: one reported having missing person reports filed about them due to them missing so much work from playing their game; another reported having his wife leave him due to their gaming habits; another detailed how the player considered committing suicide in real life due to the alienation they felt from playing for so long (Chappell, et al. 2006).

Video games have built in reward structures to encourage certain particular methods of gameplay, IBGs feature social rewards which are outside of the game but instead are enforced by the players within the game and not the game itself. These reward structures exist on two levels: interpersonal or players' interactions with others, and intrapersonal or inner felt sense by the player. Interpersonal rewards include being viewed as a cooperative player by peers and able to participate in group play rather than

ostracized for poor play style (Yee, 2006). In WOW, players can group together to achieve different goals. Players who are unfriendly and do not cooperate can be vote kicked from the group by their fellow players.

To further illustrate the reward and punishment Taylor and Taylor (2010) explored these meta-game functions on both interpersonal and intrapersonal level. Taylor and Taylor (2010) identified four different categories of player motivations. The first motivation Taylor & Taylor (2010) identified was intrapersonal motivation for playing; the intrapersonal motivation is focused upon the feelings of the player and how the game is a means to modify their mood or to receive a feeling of personal achievement; only nine of the 77 respondents identified this as their reason for playing. Taylor and Taylor (2010) identified the second group of motivations as being intrapersonal negative factors which was the player continuing their gaming behavior in order to avoid feelings of loss; only six of the 77 respondents identified this as their reason to play (Taylor & Taylor, 2010).

The most popular motivation was interpersonal positive factors where the player perceives their social interaction to be enhanced by the game play, with 41 of the 77 respondents identifying it as their reason to play (Taylor & Taylor, 2010). The second most common motivator of play being the negative interpersonal (21 of 77) where players continued to play in order to avoid feeling loss of community (Taylor & Taylor, 2010).

A study by Yee (2006) found that the proportion of teenagers was less than 25% percent of the player base and that many were older, gainfully employed, and sometimes married with children. Yee (2006) interviewed a female player who would group with

enjoyable players regardless of if they would find good items or acquire more experience points as she found more pleasure in having the social interaction over acquiring in game rewards, this is an example of the interpersonal motivators found by Taylor and Taylor (2010). The impact of addictive playing MMORPG on relationships has become is synonymous with discord so much that some games like WOW have earned nicknames such as “World of Warcrack” denoting their addictive nature.

Consequences of Problematic Play

There are many consequences to excessive play which include: physical, mental, and social problems. These problems range from muscular discomfort, to feelings of isolation, symptoms of depression, and in rare cases death. This section will discuss the different consequences experienced by people affected by problematic play and related disorders.

Physical health consequences. Video games are an exciting form of entertainment, however their excessive use has resulted in multiple deaths due to players neglecting food, bathroom breaks, and sleep. The first recorded death that was attributed to video game use is the case of Peter Burkowski's (Kiesling, 1982) who died suddenly from heart failure while he was playing the game Berzerk (1982) at an arcade for an extended period. Death experienced by players is via pulmonary thrombosis or “eThrombosis” as it has been dubbed by one researcher in Korea (Mullan & Sublette, 2010).

Notable recent deaths due to excessive video game include: the 2004 case where a young Korean man aged 24 died from heart failure after playing an online game for almost 80 consecutive hours (Mullan & Sublette, 2010); the 2012 case where an 18-year-

old man died from health complications after playing for almost thirty hours (Rudd, 2012); the 2011 case where a 30 year old man died in an internet cafe on the outskirts of Beijing after playing for nearly three days in a row (Rudd, 2012). The deaths resulting from the excessive use of video games are the most extreme physiological hazard.

Common physical hazards of problematic play range from wrist strain to back pain but these are not any different from offline games furthermore, the same can be observed in any repetitive strain injury from other activities such as tennis or gardening (Mullan & Sublette, 2010). Another consequence of excessive play includes muscle pain that has been dubbed "Nintenditis" or "Pac-man Elbow" (Mullan & Sublette, 2010).

Mental health consequences. The presence of mental health disturbances is another concern for players. In a systematic review on IGD empirical research Kuss and Griffiths (2014) found that there were a host of psychopathological traits in people who play video games excessively including; avoidant and schizoid interpersonal tendencies, loneliness and introversion, social inhibition, aggression and hostility, easy to bore, excitement seeking, diminished self-control, narcissistic personality, low self-esteem, neurotic states, anxiety, low emotional intelligence, low self-efficacy in real life as opposed to high self-efficacy in the game world, and diminished agreeableness. The psychopathological traits of depression, anxiety, social anxiety, low self-esteem and loneliness are discussed in this section.

Depression. In the DSM-5 the construct of depression is characterized by multiple disorders which are separated by their duration, timing, and presumed etiology (APA, 2013). Depression is characterized by a variety of symptoms including somatic and cognitive changes, feeling of persistent sadness, and irritable mood that persist over a

period of time (APA, 2013). Careful consideration has been given to separate normal grief and sadness from depressive disorders in the DSM-5 including the removal of the time limit of what was considered normal grieving period (APA, 2013).

A cross-sectional study of 448 adult gamers by Achab et al. (2011) found that gamers had 3x higher rates of irritability, daytime sleepiness, sleep deprivation, low mood, and emotional changes. Achab et al. (2011) used a self-administered online format in their study with measures including the DSM-IV-TR substance dependence scale adapted for MMORPG, Goldberg Internet Addiction Disorder scale, and the Internet Addiction Test. Achab et al. (2011) found that many gamers were at considerable risk for addiction and advocated for the creation of health services that catered to them.

A longitudinal study of 1928 Norwegian adolescents by Brunborg, Mentzoni, and Frøyland (2014) found that problematic gameplay was correlated with increased depression, decreased grades, and various conduct problems. Brunborg et al. (2014) measured this with a variety of scales that measured frequency of Video game use, academic achievement, and conduct problems. Brunborg et al. (2014) used the instruments including Game Addiction for Adolescents and the Hopkins Symptom Checklist. The Game Addiction for Adolescents scale was based upon the DSM criteria for other addictions and was used to assess their salience, tolerance, mood modification, withdrawal, relapse, conflict and problems (Brunborg et al., 2014). The Hopkins Symptom Checklist was used to determine clinical complaints of the players which included feelings of depression and sadness among other complaints. Brunborg et al. (2014) found that video game addiction was associated with poorer academic achievement, conduct problems, and higher levels of depression.

A cross-sectional online survey of 321 participants by Dupuis and Ramsey (2011) investigated depression in MMORPGs in relation to social supports. Dupuis and Ramsey (2011) evaluated this relationship using a 13-item Likert survey to measure involvement in gaming. Dupuis and Ramsey (2014) used multiple measures as well including the Multidimensional Scale of Perceived Social Support and the Center for Epidemiological Studies Depression Scale. They found data that was the opposite of previous understanding of MMORPGs, that greater levels of social involvement in the game were related to actually lower levels of perceived social support (Dupuis & Ramsey, 2011). The paradox that they identified was that while the internet may connect people across greater distances that it does not replace meaningful human interaction in the flesh (Dupuis & Ramsey, 2011).

A semi-experimental treatment study of 568 total participants by Huanhuan and Su (2012) found that predictors of disordered game use included: being male, rumination of thoughts, short-term thinking, all or nothing thinking. While determining this Huanhuan and Su (2012) used a variety of scales which included the Internet Addiction Scale, Cognitive Distortion Scale, and Online Game Cognitive Addiction Scale. The study sample was divided into two groups; the survey group was larger and made up of 540 participants recruited from middle schools and aged 12-19 (Huanhuan & Su, 2012). The smaller treatment group was made up of 28 adolescents with IGD who were recruited from a mental hospital (Huanhuan & Su, 2012). They found that the treatment groups responded to Cognitive Behavioral Therapy and basic counseling in a similar fashion by having reduction in their internet addiction scores and online game cognitive addiction scale (Huanhuan & Su, 2012).

A cross-sectional survey of 110 gamers by Hull, Williams, and Griffiths (2012) found that decreases in happiness were the strongest predictors of addictive like experiences in gamers. Hull et al. (2012) used a variety of scales in this study which included a 24 item checklist of structural characteristics of games, flow state scale, Oxford Happiness Questionnaire, and Game Addiction Scale. Hull et al. (2012) found the social interaction within the gaming environment contributed the most to addictive behavior.

A cross-sectional survey of 689 participants by Tolchinsky (2014) investigated subjective experiences of problematic video game playing and used the Revised Problem Video Game Playing scale to assess this. Tolchinsky (2014) found that there were numerous differences between gender preferences in gaming and the manifestations of problematic video game playing. Particularly in regards to depression, Tolchinsky (2014) found that there was a strong relationship between men with problematic video game play and depression ($r = .41$; $p < .001$) while women had weak correlation ($r = .23$; $p < .01$) with the same.

In the cross-sectional study of 722 online participants Wei et al. (2012) found that depressive symptoms were present in some individuals with video game addiction. Wei et al. (2012) used various instruments including Depression and Somatic Symptoms Scale, Social anxiety Inventory, and the Chen Internet Addiction scale. Wei et al. (2012) found that longer play history and weekly hours had more depression symptoms and addictive symptoms. Wei et al. (2012) found that female players had higher amounts of depressive symptoms (13% $n=121$, $p = 0.032$) despite having less game time and experience than their male counter-parts.

Depression is a serious disorder characterized by a low mood, feelings of emptiness, and lack of energy among other symptoms. The negative consequences from depression include decreased social functioning, loss of productivity, and in some cases suicide. Depression has been found to be an important aspect in multiple studies on people suffering from IGD (Achab et al., 2011; Brunborg et al., 2014; Dupuis & Ramsey, 2011; Huanhuan & Su, 2012; Hull et al., 2012; Tolchinsky, 2014; Wei et al., 2012). Depression is an important disorder to understand because it effects many different people and has been examined before in relation to IGD.

Anxiety. The construct of anxiety is characterized by excessive fear and behavioral dysregulation under certain circumstances according to the DSM-5 (APA, 2013). The DSM-5 has multiple disorders under the anxiety section however, only social anxiety and general anxiety were investigated in this study. Generalized anxiety is characterized by fear and avoidance of regarding general life circumstances, while social anxiety is focused upon fear and avoidance of social circumstances specifically (APA, 2013). Special attention is paid to social anxiety in my research as it has been shown in previous research to be connected to IGD (Gentile, Choo, Liau, et al, 2011; Herodotou, Kambouri, and Winters, 2013; Kowert and Oldmeadow, 2014; Mehroof and Griffiths, 2010; Rooij et al. 2014; Wei et al, 2012; Tolchinsky, 2014).

Social anxiety disorder (SAD) is defined by a pronounced fear of particular social situations, particularly where one may be under scrutiny by others which leads to impairment and clinically significant distress (APA, 2013). The DSM-5 provides ten diagnostic criteria which examine the individuals functioning across a variety of levels including; social, academic, and occupational areas of functioning (APA, 2013)

Individuals with SAD often have a marked fear of a social situation in which they are exposed to scrutiny examples of this are meeting new people or speaking in public (APA, 2013). Individuals with SAD almost always find social situation to cause fear and anxiety (APA, 2013). Individuals with SAD often avoid or endure these social situations with great fear and anxiety (APA, 2013). Individuals with SAD have anxiety that is out of proportion to the actual threat posed by the social situation and based upon context, this is to distinguish what is normally anxiety provoking to what is not (APA, 2013). Individuals with SAD have fear and anxiety that is persistent, meaning lasting for at least 6 months or more (APA, 2013). Individuals with SAD are unable to attribute their anxiety and fear to another medical condition or mental disorder (APA, 2013). These diagnostic criteria provide a framework through which the construct of SAD can be examined and understood, a social fear which while irrational provides the individual with clinically significant suffering.

A longitudinal study of 3034 children by Gentile, Choo, Liau, et al (2011) found that predictors of pathological gaming were longer game time, lower social competence, and impulsivity. Gentile et al (2011) found that the outcomes of pathological gaming included depression, anxiety, SAD, and lower academic performance in school. The study by Gentile, et al. (2011) found that SAD and anxiety symptoms in children with pathological gaming habits were worse than children without pathological gaming habits.

A qualitative cross-sectional study of 1298 WOW players by Herodotou et al., (2013) found that players were meeting their basic psychological needs through engagement in the game. Herodotou, et al. (2013) conducted a survey of players to investigate the stereotype of the socially dissatisfied gamer and found that player's

reasons for gaming fell into five themes which were; collaborative relationships, competitive relationships, fun, gameplay, and escapism. The main reason for gaming was collaborative relationships which made up 56.4% of responses, and that the gamers were largely social and productive in their lives (Herodotou, et al. 2013). Herodotou, et al. (2013) found that most players surveyed were largely satisfied with their social lives and played WOW to enhance their social life. Herodotou, et al. (2013) found that the majority of players were largely social and measured this through the use of survey questions and examining the fulfillment of the Basic Psychological Needs (BPN). Herodotou, et al. (2013) found that escapism made up 15.6% of the responses for reasons of playing which was where the players desired to escape their life circumstances and forget about their worries; suggesting the stereotype of the socially dissatisfied gamer may be a minority.

A cross-sectional study of 797 online participants by Kowert and Oldmeadow (2014) to examine the relationship between gaming as a social accommodation and players with insecure attachment. Kowert and Oldmeadow (2014) found that surveyed players with attachment issues had a positive relationship ($r= 0.226$, $p < 0.001$) between playing for social comfort. Kowert and Oldmeadow (2014) used the following measures: a Social Skills Inventory to assess their social functioning, Experiences in Close Relationships to assess their attachment style, and an involvement sub-scale to determine their level of engagement in gaming. Kowert and Oldmeadow (2014) found that highly engaged players displayed different social traits than those who were not, and while there was a relationship established between gaming and social competence it was not associated with deficiencies across a wide spectrum of socializing. Instead, Kowert and

Oldmeadow (2014) concluded that the games provided those with insecure attachment with a social network which was critical to their mental health and feelings of belonging.

A cross-sectional study of 123 university students by Mehroof and Griffiths (2010) found certain traits in those with disordered video game use including; neuroticism, sensation seeking, state anxiety, and aggression. Mehroof and Griffiths (2010) found that state anxiety and sensation seeking were the highest predictors of problematic play. Mehroof and Griffiths (2010) used different measures including: Gaming Addiction Scale to examine the game playing habits, the Eysenck Personality Questionnaire (revised short scale) to measure neuroticism traits, and the State-Trait Anxiety Inventory for Adults to examine their anxiety. Mehroof and Griffiths (2010) concluded that State-Trait anxiety was among the most important traits determining if an individual would develop IGD.

A study of 8478 adolescents by Rooij et al. (2014) examined the presence of substance use and problematic video game play and found that boys were more likely to develop problematic video game play habits. Rooij et al. (2014) used the Revised Social Anxiety Scale for Children and Social Avoidance and Distress to measure SAD in their sample. Rooij et al. (2014) found a relationship between problematic video game playing and SAD, the anxiety was more severe within those with high problematic video game play. This aligned with past research, however, it was noted that SAD seemed to function as an outcome in another study (Gentile et al., 2011). Those with SAD preferred online interactions, though their condition appeared to be further exacerbated by problematic video game play (Rooij et al., 2014).

A cross-sectional study of 722 participants by Wei et al. (2012) found that players with greater weekly hours of play had a longer history of play with greater depressive symptoms, SAD, and addictive symptoms. Wei et al. (2012) found that female players had lower time played and shorter gaming history but had greater socially anxious symptoms than their male counter-parts. Wei et al. (2012) concluded that female player tended to use games to cope with negative mood and anxious symptoms more than males.

A cross-sectional survey of 689 participants by Tolchinsky (2014) found that problematic video gaming was correlated with depression, anxiety, and stress. Tolchinsky (2014) surveyed the player's subjective experiences alongside the Revised Problem Video Game Playing scale and found that problematic video game playing was correlated to psychopathological issues. Tolchinsky (2014) found that problematic video game play had a significant relationship to anxiety for men ($r = 0.41$; $p < .001$), while women showed only weak correlation ($r = 0.25$; $p < .01$) with the same.

SAD is a debilitating disorder characterized by an avoidance or fear of social situations which may lead to judgment or interaction with others. The consequences of SAD are wide spread and affect people at varying levels with some only fearing public speaking, while others avoid social contact altogether (APA, 2013). SAD has been found to a significant factor in multiple studies of players with IGD with a wide variety of negative consequences on the individual and their relationships. (Gentile et al., 2011; Herodotou et al., 2013; Kowert & Oldmeadow, 2014; Mehroof & Griffiths, 2010; Rooij et al., 2014; Tolchinsky, 2014; Wei et al., 2012). Generalized anxiety is problematic as well and often studied alongside SAD, however they are different constructs and are studied using different methods.

Social consequences. IBG can provide social interaction for individuals who live far away from others with similar interests, providing feelings of camaraderie, companionship and even love in a virtual world. A notable case study featured a young boy aged eleven years named Martin (Wood, 2007). His parents were concerned about his time spent playing WOW (2004) and sent him for treatment, it was determined that Martin found video games as a way to socialize and make friends while he was being bullied at school (Wood, 2007). The case studies provided by Wood (2007) also had instances of the alienating effects of video games such as Helen a 32-year-old British female who took multiple weeks off work and stopped seeing her friends to play an MMORPG. Other research has shown similar cases and isolation, such as the Taylor and Taylor (2010) study of Everquest (1999) players, online video games can have negative impacts on social interaction as they can isolate and alienate players from their social network.

A systematic review by Mullan and Sublette (2010) found a trend between increased gaming ability and decreased ability to socialize in real life in their review of studies on problematic gameplay. The detrimental effects of video games are commonly observed in the loss of social network, poor marks in school, and work problems when compared to the isolated deaths due to health complications (Mullan & Sublette, 2010).

While isolation is observed in other kinds of addiction, the kind of isolation that occurs within IBG and particularly MMORPG is unique since the player may socialize within the online world (Chappell et al., 2006). Chappell et al. (2006) investigated the phenomenological experience of Everquest (1999) players and found that players

displayed many characteristics similar to other addictions including, social conflict, mood modification, tolerance, withdrawal, cravings, and relapse.

Some players who move often finding a group of real life friends is difficult, thus they feel that their online community is their only permanent group of friends (Chappell et al., 2006). There can be serious consequences from social withdrawal caused by excessive gaming: unemployment, divorce, alienation, and even suicide (Chappell, et al 2006). Social conflict is the dissonance experienced by players in their personal relationships with others. The conflict can include but is not limited to a break down on multiple tiers of social interaction including: social exclusion, relationship turmoil, work and academic problems, and loss of support network. The developers of WOW inserted messages into their loading screens that encouraged players to visit their friends in real life, use parental features to manage their time, and playing in moderation (Blizzard, 2004). The effectiveness of these reminders are unknown.

Loneliness. Studies of people with IGD found loneliness to be significantly predictive of problematic game play (Lemmens et al., 2010) as well as having less social and emotional supports (Kowert et al., 2014). However, some players reported using the social aspect of the game pro-actively and were largely social in nature (Herodotou et al., 2013), meaning that the lonely gamer is a minority. Feeling loneliness sometimes is a part of life, however it can be very painful when the isolation becomes absolute and there is no perceived way out.

A cross-sectional study of 1298 WOW players by Herodotou et al. (2013) found that social interactions both competitive and collaborative were their main reason for playing online games. Herodotou et al. (2013) found significant but weak associations (r

= -0.09, p <. 0.001) between the players' basic psychological needs and time spent playing WOW which suggested that real-life socio-economic was less likely to be impacted by gaming. Herodotou et al. (2013) used a basic psychological needs index in an online survey on reasons for playing. Herodotou et al. (2013) found players surveyed used WOW to keep in touch with friends and make new connections.

A cross-sectional survey of 4500 German players by Kowert, Domahidi, Festl, and Quandt (2014) found that increased online play is associated with greater social isolation; meaning they had less emotional and total social supports in association with lower confidence. Kowert et al. (2014) used a survey of game play and social network survey to study this. Kowert et al. (2014) found that increased social online gaming and not offline video gaming was associated with low quality offline social networks.

A two-year longitudinal study of 851 players by Lemmens, Valkenburg, and Peter (2011) found there was a significant relationship between gaming and loneliness. Lemmens et al. (2011) found that lower social skills and loneliness was significantly correlated with pathological gaming. Lemmens et al. (2011) determined this using the following instruments, Satisfaction with Life scale, Social Competence scale, and UCLA Loneliness scale.

Self-esteem. Self-esteem is a characterized by a person's self-worth and how they view themselves. Self-esteem is an important aspect to be considered when studying IGD. A person with high self-esteem thinks of themselves as a worthy individual while those with low self-esteem often feel unworthy.

In a systematic literature review by King and Delfabbro (2014) found of the four common factors of IGD sufferers, using games to meet self-esteem needs was one of

them. King and Delfabbro (2014) found this by conducting research on multiple online research databases including Academic Search Premier, PubMed, PsychINFO, ScienceDirect, Web of Science, and Google Scholar. King and Delfabbro (2014) found that cognitive symptoms such as preoccupied gaming thoughts and self-esteem issues were connected in that players would self-medicate low self-esteem by playing video games.

A two-year longitudinal study of 851 players by Lemmens, Valkenburg, and Peter (2011) they found there was a significant correlative relationship between gaming and self-esteem. Lemmens et al. (2011) found that lower social skills and self-esteem were associated with pathological gaming six months later. Lemmens et al. (2011) determined this using instruments such as: Satisfaction with Life scale, Social Competence scale, and Six-item Self-esteem scale.

Consequences Summary

IGD provides a wide range of consequences for those who have been afflicted by it and these consequences can manifest in varying aspects of the player's life. This can effect a person in the mental, social, and physical domains. This chapter presented these areas and how they have been studied in the past because it was relevant to current study which will examine the same.

Research on the Internet

The internet is a valuable research tool and there have been many other studies conducted in similar fashion. Achab et al. (2011) studied gaming characteristics of 448 adults through an online survey. Herodotou et al. (2013) used the internet to study socialization habits of 1298 WOW players. Their sample was gathered through the WOW

websites and other gaming forums. Kowert and Oldmeadow (2014) studied 797 online participants in while researching using gaming as social comfort. The internet is an invaluable tool for research and allowed me to study participants internationally.

Griffiths (2010) explored online methodologies for data collection in gambling and video gaming addiction research; they found that there were many advantages to this form of data collection. The internet allows the collection of detailed data from sensitive populations which may be difficult to approach in public (Griffiths, 2010). This form of data collection may be more accurate than face to face interactions due to the dis-inhibiting effect of online interactions; meaning data collection online may lead to higher validity due to research showing greater emotional disclosure and higher levels of personal disclosure online over in the flesh interaction (Griffiths, 2010). Furthermore, those who are socially awkward may be willing to answer an online survey instead of a face to face one (Griffiths, 2010). Internet data collection provides ease of access for those who might not otherwise have opportunities to take part in the survey if it was not online (Griffiths, 2010). The internet data collection has a potentially global pool of participants and can provide cost effective solutions to creating cross cultural studies (Griffiths, 2010). Lastly, using the internet to recruit participants is aided by the presence of multiple forums, bulletin board systems, chat-rooms, and websites. There are many benefits to using the internet for research.

Components of Addiction

The DSM-5 diagnostic criteria for IGD shares many aspects with the criteria for substance addiction and gambling disorder, despite sharing traits with IGD are they are different in many ways (APA, 2013). People suffering from IGD do not suffer from the

financial consequences associated with gambling disorder (Wood, 2007). People can die from prolonged problematic play in certain cases but this is considerably rare when compared to substance addiction overdoses (Wood, 2007). People with IGD most commonly experience consequences which are considered peripheral indicators which are; loss of time, and social problems both occupational and academic (Wood, 2007).

Griffiths (2005) discussed the components model of addiction which functions in a biopsychosocial framework and showed that all addictions are consistent within six components. Griffiths (2005) argues that these six components are similar across all addictions and excessive behaviors and that an eclectic approach to studying them would be best in understanding them.

Griffiths (2005) discussed six core components which are found in all excessive behaviors and addictions. Griffiths (2005) discussed salience which is the tendency for the addictive behavior to become the most important in the person's life often taking significant time and interfering with functioning in expected roles. Within salience the person is pre-occupied with maintaining, using, or seeking their addiction or behavioral excess (Griffiths, 2005). Griffiths (2005) discussed mood modification as a common component as well, this is where a person engages in their addictive behavior. Griffiths (2005) argues that Tolerance is another core component; this component is wherein the addictive process requires an increasing amount to maintain its desired effect, whether that is amount of heroin used, video games played, sexual acts performed, or money gambled (Griffiths, 2005). Withdrawal symptoms are another core component which are the feeling or physical effects which occur when the addictive activity is ceased or reduced (Griffiths, 2005). Conflict is the core component that identified as the

interpersonal and intrapersonal discord caused by the activity (Griffiths, 2005). Relapse is the last core component suggested by Griffiths (2005) and refers to the tendency for individuals to return to previous behavior and for patterns of addiction to resume at their previous morbidity even after years of discontinuation. These core components of addiction are seen in both substance use and gambling, though often taking different forms dependent on their environment, user, and social context. The core components of addiction are useful in understanding addiction.

Loss of Control as Defining Feature of Addiction

Loss of control or impulsivity is a central feature of addiction and is necessary to understand in the context of IGD. Loss of control is seen as the addicted person's inability to manage their behavior as the severity of their addictive condition worsens (Blume, Rudisill, Hendricks, & Santoya, 2013). For people suffering from IGD loss of control is seen in their inability to control their play time length and/or frequency. This has been shown in other studies such as the two-year longitudinal study by Gentile, et al. (2011) where they saw greater impulsivity as a risk factor to developing disordered play.

According to Billieux, Deleuze, Griffiths, and Kuss (2015) there is evidence that the multi-faceted nature of loss of control is connected to the particular psychological and motivational mechanisms. Billieux et al. (2015) found that the main dimensions within loss of control are related to the executive mechanisms on both the conscious and less conscious aspects of self that can determine whether a person is susceptible or not to their impulsivity. Billieux et al. (2015) found that the three main dimensions of impulsivity were urgency, lack of premeditations, and lack of perseverance. Billieux et al. (2015) found that the executive mechanisms such as inhibitory control, decision making ability,

and resistance to cognitive interference were related to the aforementioned dimensions of impulsivity. The ideas of Billieux et al. (2015) have been illustrated by other studies that showed that disordered play was tied to having poor decision making ability, impairments to executive mechanisms, and other mechanisms involving their self-regulation. Loss of control is a keystone to understanding addictions and is especially important in understanding IGD.

Similarities to Substance Addiction

The core components of addiction as previously discussed by Griffiths (2005) are salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. The negative issues that are commonly associated with excessive video game use include conflict, withdrawal, relapse, and salience (Wood, 2007) all are features which are all core components of addiction as suggested by Griffiths (2005). While video game addiction does not have legal risks or overdose dangers, in the same fashion that substance addictions have (Wood, 2007), those with IGD suffer in other numerous ways.

An entire range of addictive symptoms have been observed in those who game excessively. Chappell et al. (2006) found the following addictive traits: relapse, mood modification, tolerance, social conflict, withdrawal symptoms, and relapse, were found in the problematic play.

A study of 225 young adults with IGD in Taiwan found that all the DSM-5 criteria except for deceiving were reported by participants (Ko et al., 2014). This is relevant to the development of the diagnostic criteria because many of the criteria for the IGD diagnosis utilize concepts from the substance addictions such as tolerance, withdrawal, and relationship conflict.

In a study of 1928 Norwegian youths Brunborg et al. (2014) found that there was a connection between excessive video game use and lowered academic standing, depressive symptoms, covert conduct problems and aggression issues. Brunborg et al. (2014) however did not find a relationship between excessive video gaming and binge drinking.

A cross-sectional study in the Ukraine of college students administered seventeen addiction assessments and found that while many behavioral addictions may not share chemical similarities, the effects of the addiction were similar in their interactions with the individual's life and circumstances (Linskiy et al., 2012).

Substance addiction is a serious issue for many people and can have severe consequences. Within the components model substance use and IGD have the same behavioral traits which include; salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse and Griffiths (2005) explained this is because all addictions and behavioral disorders share common components, regardless of their type. The study of substance addiction within an IGD population is important and Linskiy et al. (2012) found that the effects of both IGD and substance use were similar in how they harmed the user.

Section Summary

This chapter discussed the topics that are relevant in relation to IGD. This chapter briefly discussed the following topics; the history and development of video games; major trends in gaming, the development of the MMORPG, the development of IGD, physical consequences of IGD, social consequences of IGD, and mental health

consequences. This chapter presented the components model, loss of control, and the similarities of IGD with other addictions.

Research Method

Introduction

This chapter discusses the methodology used to answer the research questions. This chapter discusses the following aspects of the research methodology; sample population, recruitment of sample, inclusion criteria, instruments used, data analysis methods, data predictions, limitations and research bias, and possible ethical concerns.

Sample Population

The sample population was made up of adult WOW players. The sample population was a convenience sample and was not representative of the general public. The survey sample was made up of 374 participants of which 215 were used in data analysis due to incomplete surveys. The survey was conducted in English, though was open to international participants.

Recruitment of Participants

The research was conducted online through www.surveymonkey.com which is a survey hosting site. Participants were recruited through the following gaming forums; www.wowhead.com, www.mmochampion.com, www.icyveins.com, www.reddit.com, www.method.com, and www.mmorpg.com. The anonymous survey was conducted by posting advertisements on these online forums, websites, and other places frequented by WOW players. The researcher provided incentive for participation in the form entry into a draw for an in-game pet for WOW.

Inclusion criteria. There were four inclusion criteria in the survey that was conducted. To have their response used in the data analysis survey participants were required to: (a) be 18 or older; (b) speak English, (c) agree to the informed consent form; and (d) be a current subscriber of WOW.

Instruments

Multiple instruments were used in the survey. Instruments were selected to measure different constructs that were of interest. The constructs being examined are IGD, generalized anxiety, SAD, loneliness, self-esteem, and depression. The instruments used to measure these constructs were: the DSM-5 Diagnostic Criteria for IGD, the Liebowitz Social Anxiety Scale Self Report (LSAS-SR), the Single Item Self-Esteem Scale (SISE), the Beck Anxiety Inventory (BAI), the Beck Depression Inventory II (BDI), and Three Item Loneliness Scale (TILS).

Demographics survey. The demographics survey asked players about their sex, age, marital status, and country of residence. Participants were required to fill out a game play survey as part of their demographics survey, this provided data on their play style within WOW and details such as amount of gaming time, server preference, class type, and guild membership.

Beck depression inventory II. The Back Depression Inventory II (BDI-II) is a self-report psychometric test that is used to assess the construct of depression in clinical populations, it has seen wide spread use in the field since its creation. The BDI-II is composed of 21-items that measure depressive symptoms over the last two weeks. The BDI-II is a valuable tool in assessment of depressive disorders because of the wide variety of symptoms it investigates ranging from sadness to loss of interest in sex. This

assessment has been constructed on a Likert scale of 0-3 with 0 indicating no issues to 3 indicating severe issues.

Psychometric properties. Given its longevity and strong psychometric properties, the BDI-II is considered a gold standard in the assessment of depression. The psychometric properties of the test were evaluated in numerous articles which demonstrate strong internal consistency and good factorial, content, criterion, and construct validity (Beck, Steer, & Brown, 1996).

Beck anxiety inventory. The Back Anxiety Inventory (BAI) is a self-report that assesses the construct of generalized anxiety in clinical populations, like its counterpart it has received widespread use throughout the field since its creation. The BAI is composed of 21-items which measure various symptoms of generalized anxiety. These symptoms include everything from feeling numbness or fatigued to feeling faint. This assessment is conducted by measuring various symptoms using a 0-3 Likert scale from 0 indicating no issue to 3 indicating severe issue.

Psychometric properties. The BAI has demonstrated good internal consistency and fair retest reliability given the variability of anxiety symptoms over time. There is evidence that the test has good convergent and discriminant validity, as well as content and criterion validity (Beck & Steer, 1993).

Liebowitz social anxiety scale self report. The Liebowitz Social Anxiety Scale Self Report (LSAS-SR) is a self-report version of the Clinician Administered Liebowitz Social Anxiety Scale (LSAS-CA) which is used to assess SAD. The LSAS has been used in the field for many years and has been shown to have strong psychometric properties (Fresco et al., 2001). The LSAS-SR is used to assess the construct of social anxiety in the

participant's life through the self-assessment of fear and avoidance of particular social situations (Baker et al., 2002). The LSAS-SR is divided into two scales that measure fear and avoidance on Likert scales (Liebowitz, 1987). The LSAS-SR is a short scale and only takes approximately three minutes to complete.

Psychometric properties. The LSAS-SR is a reliable and valid instrument in the measurement of SAD. The LSAS-SR has been found to be a reliable assessment tool with good test-retest reliability over a 12-week period (Baker et al., 2002). The LSAS-SR has been found to be a highly reliable measure when self-administered over the internet as well and the LSAS-SR internal consistency ranges from 0.81 to 0.94 when administered on the internet (Hedman et al., 2010). The study by Hedman et al. (2010) found that the LSAS-SR had high test-retest reliability of 0.80 to 0.94 and shares construct validity with other similar tests. Furthermore, the LSAS-SR is written in plain language suitable for use as a self-reporting tool.

Three-item loneliness scale. The Three Item Loneliness Scale (TILS) measures the construct of loneliness and was developed using items from the Revised UCLA Loneliness Scale (R-UCLA) which contains 20 items; the R-UCLA and was considered too long for use with large surveys and the TILS was adapted for use in such surveys (Hughes, Waite, Hawkley, & Cacioppo, 2004). Loneliness is a serious problem and the TILS was tested in multiple studies to see if it was an effective measure. In a longitudinal study by Hughes et al. (2004) found in their sample of 2182 participants from the general public that the TILS provides strong evidence of association between objective and subjective social isolation, which means that if a person perceives themselves as being lonely, they feel lonely. In another longitudinal study by Hughes et al. (2004) of 229

clinical participants they further confirmed the association between subjective and objective isolation and that the tool is useful in measuring this construct.

Psychometric properties. The TILS has good psychometric properties overall considering the relative brevity when compared to the R-UCLA. In a longitudinal study of 2182 participants by Hughes et al. (2004) TILS was found to have a Cronbach's α of 0.72 which meant that it had adequate internal consistency although it is lower than the R-UCLA. The TILS was found to have high discriminant and convergent validity in measuring the construct of loneliness (Hughes et al., 2004). Participants TILS scores were weakly associated with feelings other than loneliness which demonstrates its discriminant validity (Hughes et al., 2004). The convergent validity was found to be high as well by examining its correlation with other measures of mood and emotion (Hughes et al., 2004). In another longitudinal study by Hughes et al. (2004) of 229 clinical participants they found that the Cronbach's α of 0.72 which indicates that the reliability was identical to the previous study. Hughes et al. (2004) found that the correlation between the R-UCLA was high at 0.82 and further demonstrates the construct validity. The TILS was found to have robust properties in both self-administered and telephone interviews (Hughes et al., 2004). The convergent and discriminant validity was found to be identical to their previous study longitudinal study; the TILS was found to be an adequate measure of the construct of loneliness, however, they identified that isolation is better measured as a qualitative construct than quantitative through this research (Hughes et al., 2004).

Single-item self-esteem scale. The Single-Item Self-Esteem Scale (SISE) is brief measure of self-esteem composed of a single item (Robins, Hendin, Trzesniewsky, 2001).

The SISE was found to have only moderate validity in regards to studying minors though it was found to be a suitable test for adult populations (Robins et al., 2001). The SISE was found to have both high convergent and discriminant validity and is usable with multiple populations (Robin et al., 2001).

Psychometric properties. The SISE does not have a conventional internal consistency as Cronbach's α cannot be calculated because it has only one item, however using the Test-retest reliability it was found to have a mean reliability estimate of 0.75 (Robins et al., 2001). When examined for stability over time the SISE was similarly found to have a reliability of 0.61 which in turn showed that the longer time between assessments, the lower the correlation in results (Robins et al., 2001). The SISE was shown to have both high convergent and discriminant validity and is highly correlated with measures of the same constructs this was determined by comparing it with the Rosenberg Self Esteem scale (Robins et al., 2001). The SISE was found to have strong convergent validity in multiple populations including: men and women, college students and community members, and ethnic minorities (Robins et al., 2001). The SISE does not have as high of reliability as other longer measures, however given the relative brevity this is a viable trade off in speed of use (Robins et al., 2001).

Procedure

Ethical concerns were addressed as required by the Faculty of Education Human Subject Committee at the University of Lethbridge (No Approval Number Provided) and upon notification of this approval the research began. Survey information was posted to various WOW game forums and places frequented by players and waited for responses. An incentive was offered to participants which was a 1-in-3 chance to win an in-game pet

from the WOW in game shop. The research was conducted online using a survey hosting website and received data was cleaned, processed, and analyzed.

The research was conducted online using a survey and had four (4) stages. During the survey the participant: (1) began the survey by filling out the informed consent which granted them access, (2) answered the demographics and gaming profile questions, (3) answered the questions from the aforementioned measures, (4) terminated the survey session. At any point on the survey participants could retract their survey consent by clicking the stop now button and end the survey session.

Data Analysis

The researcher performed data analysis using SPSS version 23 software. SPSS was an invaluable tool in the data analysis due to the ease of use and wide variety of analyses available to be performed through it. The researcher was able to perform all data analysis using SPSS and did not use additional software.

Binary logistic regression. The researcher performed a binary logistic regression-forward stepwise data analysis; this analysis is used to determine what independent variables are predictive of the dependent variable (Yockey, 2011). The binary refers to the dependent variable being binary and measured in that participants either met the criteria for IGD or not. The forward stepwise refers to the method of how variables are examined, in forward stepwise analysis the process begins with no variables and then each is added in and measured progressively through a series of sub-analyses; the relevant variables are found and removed and the process runs until all variables are found to be either relevant or irrelevant to the data set that is in question (Yockey, 2011). This analysis was useful in the research as it helped determine what independent

variables are predictive of IGD in the sample. The forward stepwise analysis examined the following variables: SAD, anxiety, depression, loneliness, class specialization, guild membership, hours of play, current age, age of start, server played on, and relationship status.

Analysis of variance. The researcher performed a one-way ANOVA analysis to look for differences between the groups. The One-way ANOVA was selected as there is only one independent variable that was being compared with IGD (Cooper, 2003). Univariate ANOVA data analysis was performed on the ranked scores for the BAI, BDI, LSAS in relation to IGD and each other. The univariate ANOVA was used to test for influence between these ranked scores and IGD.

Possible limitations of data. There were limitations to the data that was gathered. The survey sample was a convenience sample and was not representative of the general population. The online survey was a self-report and participants may have entered data that was erroneous either intentionally or unintentionally. Participants may have felt intimidated or upset by the questions causing them to terminate the session.

Researcher biases. The researcher identified the following which may manifest as bias: the researcher is interested in video games and has knowledge on the game of topic. This bias was evident as the researcher had to be reminded to explain jargon terms such as MMORPG, RPG, PVP, and RP.

Predictions. The researcher made multiple predictions about what they expected to find in the data. The researcher predicted that there would be an association between IGD and the male gender. The researcher predicted that guild involvement would be associated with IGD and predicted this because being part of a guild provides a secondary

social circle which a disordered person might feel inclined to escape into. The researcher predicted that having a single marital status would be associated with IGD and predicted this because a single person might be inclined to ameliorate feelings of loneliness through playing games online with others. These were the outcomes the researcher expected prior to undertaking data analysis.

Researcher role. The researcher wore many different hats as their role shifted during each stage of the thesis. The researcher's role in the study was in the creation of the literature review, researching and gathering measures, creating the online survey, gathering responses from the online survey, responding to participants, emailing winners of the incentive draw, performing the data analysis, recording the results, and presenting the relevant data and making conclusions from that data. The researcher learned a great deal about being adaptable and the hard work that goes into the creation of new research.

Ethical concerns. All known ethical concerns were addressed as required by the Faculty of Education Human Subject Committee at the University of Lethbridge (No Approval Number Provided). There were potential ethical issues identified, particularly a minor could lie to obtain access to the survey as there is no way to officiate age online. Another issue was a participant could be upset by the questions asked by the survey. The researcher provided a link to the Canadian Mental Health Association. For international participants the researcher encouraged participants to seek help if they felt upset by the survey by contacting their appropriate health service provider. These were the ethical issues that were identified.

Section Summary

This chapter covered the research methodology and discussed the instruments used. The chapter explained the following topics; sample population, recruitment of participants, inclusion criteria, instruments used, procedure, data analysis, and possible limitations of data.

Results

Introduction

This chapter will discuss the results of the research on the social and emotional aspects of WOW players, these results include; the demographics of the studied population and the answered research questions. This chapter summarizes the results and present them in a succinct manner.

Demographics

A total of 374 participants were surveyed and of them 215 participants completed the survey and were used in the final data analysis. The sample was made up of a total 85.9% (n=184) males and 14.4% (n=31) females. The mean age of participants was 28.44 with a standard deviation of 8.95. The participants were gathered from online forums from several popular WOW forum websites which allowed users from many different server regions of the world to participate. Users were from North America 45.6% (n=98), Europe 46.3% (n=100), and other regions 8.1% (n=17). The participants surveyed were made up of different marital statuses with 57.2% (n=123) reported being single and 42.8% (n=92) reported having a partner.

Research Questions

The research questions were answered through the data analysis. The researcher divided the participants into two groups, WOW players who met DSM-5 IGD criteria (IGD1) and those who did not (IGD0). Multiple data analyses were performed to determine the answers to the research questions.

What are the game-play characteristics of WOW players? The gameplay survey examined the habits surrounding the surveyed participants' style of gaming. The researcher determined the gameplay characteristics of the surveyed WOW players through descriptive statistics. The gameplay survey included their age of start, hours played per week, membership in a guild, preferred server type, and specialization.

Table 1. Player Age and Hours of Play

	N	Min.	Max.	Mean	Std. Deviation
What is your age?	215	18	66	27.76	8.792
How many hours in a week do you play World of Warcraft?	208	0	160	28.07	29.726
At what age did you start playing World of Warcraft?	215	8	56	18.77	7.779
Valid N (listwise)	208				

Table 2. Player Server Type

		Frequency	Percent
Valid	Roleplaying (RP)	31	14.3
	Player Versus Player (PVP)	65	30.1
	Regular (Normal)	115	53.8
	Roleplaying Player Versus Player (RPPVP)	4	1.8
	Total	215	100.0

Table 3. Class Specialization

		Frequency	Percent
Valid	Damage	118	55.0
	Healer	46	21.6
	Tank	50	23.4
	Total	215	100.0

Table 4. Player Guild Membership

		Frequency	Percent
Valid	Yes	155	72.3
	No	60	27.7
	Total	215	100.0

The social and emotional survey gathered data on social and mental health constructs. The survey included IGD criteria from the DSM-5. The researcher found that 89.3% (n= 192) of participants were in the IGD0 group and did not meet the criteria for IGD; 10.7% (n= 23) of participants and met the criteria for DSM-5 IGD and were placed

in the IGD1 group. According to the survey, the typical WOW player was 27 years old and started playing at 20 years old, is a member of a guild, plays on a Normal server, and uses the damage class specialization.

What game-play factors and social and emotional aspects predict IGD? The researcher performed a binary logistic regression- forward stepwise to examine what variables are possible predictors of IGD. A binary logistic regression was used to predict scores on one variable while examining the scores of another (Yockey, 2011). Through the binary logistic regression class specialization was found to be predictive of IGD.

There are three types of specialization for players to choose from which vary in popularity. The class specialization is differentiated by what they do; Damage specialization focuses upon killing enemies, the Tank specialization has massive amounts of health and armor so they can absorb punishment, and the Healer specialization focuses upon healing the party, removing harmful diseases and curses, and reviving fallen party members.

The IGD0 group played Damage (70.83%) (n= 136), Tank (11.97%) (n= 23) and Healer (17.18%) (n= 33); the IGD1 group played Damage (39.13%) (n= 9), Tank (34.78%) (n= 6) and Healer (26.08%) (n= 8). The difference in the IGD0 and IGD1 groups suggests IGD1 shows significant ($p < 0.05$) preference for tank and healer roles. The researcher analyzed the construct of loneliness in the research. Past research on loneliness and IGD has found that increased online play meant a smaller lower quality social network (Kowert et al., 2014; Lemmens et al., 2011.) While loneliness may be experienced by those with IGD it is not found to be predictor of the disorder through the regression whether the loneliness was felt in real life ($p= 0.09$) or online ($p = 0.45$).

The researcher analyzed the construct of self-esteem in the research. Previous research on the connection between self-esteem and IGD suggested that players would often play to ameliorate feeling low self-esteem and fulfill self-esteem needs (King & Delfabbro, 2014; Lemmens, et al. 2011). The regression showed that self-esteem was not predictive of IGD ($p = 0.378$). The researcher found there was no significant relationship ($p = 0.55$) between IGD and player guild membership.

This lack of relationship is important because it is counter to what the researcher expected to find. Guilds are groups of players that band together to work towards common goals and socialize. The researcher expected there to be a relationship here because a Guild requires players to log in regularly to maintain membership which in turn requires the player to invest increased gaming hours.

Greater amount of hours played per week ($p < 0.05$) was found to be predictive of IGD. A high LSAS rank ($p < 0.05$) was found to be predictive of IGD. Higher BDI rank ($p < 0.05$) was found to be predictive of IGD.

Table 5 shows the removed predictive variables at each step of the regression and the significance of the changes.

Table 5. SPSS Regression Results at Each Step

	Variable	Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 1	BDIrank	-72.433	28.373	1	.000
Step 2	LSASrank	-58.400	7.679	1	.006
	BDIrank	-59.011	8.902	1	.003
Step 3	LSASrank	-54.443	9.500	1	.002
	BDIrank	-53.499	7.612	1	.006
	Spec	-54.963	10.541	2	.005
Step 4	LSASrank	-53.461	12.823	1	.000
	BDIrank	-49.388	4.676	1	.031
	Spec	-52.509	10.919	2	.004
	Hours	-49.830	5.560	1	.018

Note: df = degrees of freedom. BDIrank = depression test rank, LSASrank = Social anxiety test rank, Spec = class specialization, Hours = hours played per week.
A binary forward stepwise regression was used to determine the predictive variables for IGD.

The observed versus expected accuracy of the regression was overall 89%. The odds ratio or Exp (B) suggests that the chances of having IGD increases at different rates depending on the particular removed variable. The odds of having IGD increase by 1.659 times for each BDI rank. The odds of having IGD increase 3.153 times for each LSAS rank. The odds of having IGD increase 1.031 times for each increase in hours played. The odds of having IGD increase by 0.116 depending on class specialization selected. This data means that the key predictors of IGD for the sample were LSAS rank, BDI rank, hours played, and class specialization.

A number of social, mental health, and gameplay variables were not found to be predictive of IGD. Gender was not found to be predictive of IGD, which supports Griffiths et al. (2015) who discussed male representation within gaming samples

Table 6. Predictive Regression Results

Correlation	Wald	Sig.
LSASrank	10.411	.001
Spec	9.340	.009
Spec(1)	9.162	.002
Hours	5.417	.020
Spec(2)	2.009	.156

a. Variable(s) entered on step 1: BDIrank.
b. Variable(s) entered on step 2: LSASrank.
c. Variable(s) entered on step 3: Spec.
d. Variable(s) entered on step 4: Hours.

What comorbid factors impact players with IGD? Data analysis was needed in order to determine to what extent each of the mental health variable contributed to the presence of IGD and influenced each other. A univariate ANOVA was used to evaluate this. The variables included in the Univariate ANOVA were IGD, LSAS, BAI, and BDI. There was significant influence ($p < 0.05$) between variables presented on Table 7. The researcher found that IGD was associated with general mental health dysfunction, and when factoring in all the various mental health variables it appears that social anxiety continues to be a significant variable associated with IGD.

Table 7. SPSS Univariate ANOVA Results Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	11.952a	38	.315	6.447	.000
Intercept	3.898	1	3.898	79.892	.000
LSASrank	.503	3	.168	3.439	.018
BAIrank	.021	3	.007	.145	.933
BDIrank	.351	3	.117	2.396	.070
LSASrank * BAIrank	1.076	7	.154	3.151	.004
LSASrank * BDIrank	1.467	8	.183	3.759	.000
BAIrank * BDIrank	.723	7	.103	2.118	.044
LSASrank * BAIrank * BDIrank	2.171	6	.362	7.416	.000
Error	8.587	176	.049		
Total	23.000	215			
Corrected Total	20.540	214			

Dependent Variable: DSMIGD
R Squared = .582 (Adjusted R Squared = .492)

Note: All single ordinal variables are in relation with IGD. BDIrank = depression test rank, LSASrank = social anxiety test rank. BAIrank = generalized anxiety rank, DSMIGD = Internet gaming disorder test result

Section Summary

This chapter explained the survey group's demographics, the data analysis used, and answered the research questions. Using the ANOVA, the researcher found that IGD, BAI, BDI, and LSAS scores influenced each other in an ecosystem of comorbidity. The researcher found that IGD was significantly influenced by SAD and even when factoring in the different mental health variables. Through the regression four factors were found to be predictive of IGD which were BDI rank, LSAS rank, class specialization type, and

amount of hours played per week. Implications and limitations of these findings are discussed in the following chapter.

Discussion

Introduction

In this chapter the researcher discusses: the predictions that were made versus the results; conclusions from research, predictors and prevalence of IGD, implications for counseling, limitations of data, and considerations for future research.

Prevalence

There have been multiple studies on IGD prevalence and they provide context for this research. In this quantitative cross-sectional survey of 215 adult online participants it was found that 10.7% (n= 23) of the participants met the criteria for IGD. There have been other studies on IGD and problematic video game play, with varying estimates to the prevalence of the disorder; this variance being the result of the different measures used and samples studied (Kim et al., 2016; Gentile et al., 2011; Griffiths et al., 2015; Müller et al., 2015; Rehbein et al., 2015).

These surveys by Müller et al. (2015) and Rehbein et al. (2015) found IGD prevalence to be 1.6% and 1.16% respectively and were much lower than this study's 10.7% (n=23) prevalence. The surveys by Müller et al. (2015) and Rehbein et al. (2015) were much larger samples which incorporated both gamers and non-gamers which would contribute to the differences in prevalence.

The study by Kim et al. (2016) is similar to the survey that the researcher conducted in that it focused on an online adult population. Kim et al. (2016) found 13.8% IGD prevalence which is much closer to the 10.7% (n= 23) prevalence found in the

survey. The longitudinal study of 3034 school aged children by Gentile et al. (2011) found that the prevalence of pathological gaming was 9% of their studied population, which is closer to the current study results as well.

Griffiths et al. (2015) indicated that because researchers have used multiple measures with different cut off points there is no way to verify if prevalence rates are accurate. Throughout the studies examined by Griffiths et al. (2015) males appeared more likely to develop disordered gaming along with the presence of concurrent disorders. Griffiths et al. (2015) said that young adolescent males may appear to be at the greatest risk this may be because of sampling bias as this group plays games more than other demographic groups. Griffiths et al. (2015) adds that university students may be at increased risk as well because of their high stress lifestyle and schedules.

Samples of online gamers have a different prevalence than a sample of the general population. Furthermore, there are societal differences between sampled countries which may contribute to the presence of IGD and it is possible that the different cultural and socio-economic landscapes of these countries may add an additional layer to understanding the context of how IGD develops.

Predictors of IGD

The regression found that four independent variables were predictive of IGD. These variables were class specialization, hours played per week, LSAS, and BDI. This means that depending on what class specialization they use they were more or less likely to have IGD. The class specializations were Tank, Damage, and Healer; Tank and Healer were predictive of IGD. Hours played were found to be a predictive factor with IGD, this would be expected because addiction is defined by the loss of control. LSAS rank was

found to be predictive and means that the more socially anxious an individual is the more likely they are to be using an online game detrimentally. BDI rank was found to be predictive and means that the more depressed an individual is the more likely they are to be using an online game detrimentally.

Social and emotional disorders and IGD. The researcher found that depression and SAD were predictive of IGD through the regression the ANOVA suggested additional significant influence from SAD above and beyond what was accounted for from the general mental health of individuals. This suggests that while IGD is able related to the general mental health of individuals SAD has a significant effect that requires further investigation to explore fully.

The researcher analyzed the construct of depression in the research. Depression has been associated with IGD in prior research (Brunborg et al., 2014; Tolchinsky, 2014; Wei et al., 2012). The research implies that general mental health problems more reasonably explain the presence of IGD than depression specifically.

The researcher analyzed the construct of anxiety in the research. Anxiety been in associated with IGD in previous research multiple studies found that anxiety symptoms worsened in combination of IGD (Gentile et al., 2011; Mehroof & Griffiths, 2011; Rooij et al., 2014; Tolchinsky, 2014; Wei et al., 2012). The findings suggest there is a significant difference between the IGD group and non-IGD group, particularly in relation to SAD, however, generalized anxiety was not found to have this significance. Social anxiety continues to be a factor in relation to IGD and this is a topic that requires further investigation to the nature of this relationship. The researcher speculates that online gaming provides a social network that allows the player ameliorate feelings of isolation.

Loneliness was examined in relation to IGD and was found to not be predictive of IGD. Past research associated loneliness and IGD as well as having smaller lower quality social networks. (Kowert et al., 2014; Lemmens et al., 2011.) Thus even though individuals with IGD may experience greater feeling of loneliness than others individuals this does make it a predictive factor.

Self-esteem was analyzed through this research and was not found to be predictive of IGD. Past research has associated low self-esteem with IGD and some individuals use games to fulfil their self-esteem needs (King & Delfabbro, 2014; Lemmens, et al. 2011). This suggests that while individuals with IGD may have lower self-esteem than other individuals this is still not a predictive factor of IGD.

Weekly gaming hours. The researcher found that increased time spent playing was predictive of IGD through the research. Time spent playing is predictive of IGD because of the loss of control as discussed in the literature review. Loss of control being the inability of the individual to manage their addictive process leading to dysregulation and consequences (Billieux et al., 2015; Blume et al., 2013; Gentile et al., 2011). An individual who experiences loss of control would then begin to experience the components of addiction as proposed by Griffiths (2005) which include; salience, mood-modification, tolerance, relapse, withdrawal, and conflict. Furthermore, the time spent playing is able to be connected to loss of control (Billieux, et al., 2015) as an individual who as IGD would feel urgency in regards to their playtime, lack of premeditation in regards to the effects of their playtime, and lack of perseverance in regards to trying to reduce their time played.

Increased gaming time is predictive of IGD, which may be due to the interaction between the components model (Griffiths, 2005) and concept of loss of control (Billieux et al., 2015; Blume et al., 2013; Gentile et al., 2011). A disordered player would have gaming as the salient activity of their day and they would spend increased time gaming due to the development of tolerance. They have probably made repeated attempt to stop playing however, they relapse they experience withdrawal symptoms. They return to play games to ameliorate their withdrawal symptoms from not playing games. They experience conflict by significant social ties and they use gaming for mood modification to ameliorate negative feelings brought on by conflict. At each point in this addictive process the player experiences loss of control; they feel unable to stop playing games and continues the addictive process (Billieux et al., 2015; Blume et al., 2013; Gentile et al., 2011). The above illustration however, is a simple speculation and the development of IGD is much more complex; especially with concurrent mental disorders contributing.

The concept of the ecosystem of comorbidity is the idea that concurrent disorders all interact with each other in a way that reinforces disordered behavior. This idea is based upon the findings of the statistical analyses that were performed, particularly this idea is supported by the findings of the univariate ANOVA. The univariate ANOVA was used to test for influence between depression, anxiety, SAD, and IGD. The univariate ANOVA found multiple significant influences between variables, this suggests that rather than a single variable being essential to IGD, it is the comorbidity of multiple disorders and the general mental health of an individual which best explains the presence of IGD. The term ecosystem of comorbidity was chosen to describe this phenomenon.

Class specialization. Class specialization was found to be predictive of IGD and the researcher believes that this is because each class appeals to a different player types. This is an aspect of gamers which warrants further investigation as to the extent that class specialization, that is to say, the way a game is played, can be predictive of IGD. The researcher speculates that class specialization was predictive of IGD because of the required skill, ability to find groups for cooperative play, and the reliance upon a party.

Tank specialization. Tank specialization requires players to be a leader within the game and know the mechanics of the encounter, furthermore they generally require a party to function as they cannot mend their own wounds or deal damage to foes effectively as the other two classes specializations can. The researcher believes that the appeal of collaborative play combined with the skill set required to play the tank specialization is why it was found to be predictive of IGD.

Healer specialization. Healer specialization requires the player to focus on healing their comrades and remove harmful curses from party members, however they generally lack the health and armor of a tank specialization and the combat ability of the damage specialization thus the healer, like the tank, requires a party to function. Perhaps the unique roll of the healer in the group is why this class specialization was predictive of IGD, they are an integral member of the group and requires the protection of other party members to survive.

Damage specialization. The damage specialization is generally able to deal damage to enemies the best and is the most common specialization as more are needed to fill out any group than healers or tanks, furthermore damage specialization are able to play alone as they are no lacking without their party. I believe the independent nature of

the damage specialization is why they are less likely to develop IGD, they are less relied upon by the party, they need to wait longer to find a group, and thus players who wish to group as fast as possible and have long hours of collaborative play choose the tank and healer specializations.

Interaction Between Variables

The researcher believes that there are possible interaction effects at work within the ecosystem of comorbidity. The following are the most prominent interactions between variables that the researcher identified.

SAD and IGD. The researcher believes that SAD and IGD may have an interaction between each other that would reinforce disordered play. As discussed by Rooij et al. (2014) individual with SAD appears to prefer online interactions over the being in the flesh, perhaps this is connected to Griffiths (2010) evaluation of online research and that the internet can allow those who are intimidated in talking about a problem in person the opportunity to have that connection. How this is related to IGD and SAD is clear to the researcher, those with SAD might yearn for social interaction with peers but be too afraid or avoidant to be able to enjoy it in real life, and thus they use the online medium to meet their social needs.

Depression and IGD. Depression and IGD may have an interaction effect. This may be from the feelings of accomplishment and excitement that individual feel upon accomplishing their goals, engaging in challenging battles, and finding rare treasure. An individual who is depressed may not feel excitement or joy in other parts of their life and thus, may gradually gravitate towards playing the game which brings these feelings instead of participating in their which feels dreary and dull in comparison.

Hours of play and IGD. The hours of play and IGD is perhaps the easiest interaction to speculate upon. The amount of hours determines high engagement in gaming, and as it has been shown in comparing general population samples versus gamer samples, the gamer populations that are more engaged in gaming have a higher prevalence of IGD. The researcher believes that because there is a limited amount of hours in the week, an individual with higher gaming hours will neglect aspects of their life to play more of their game. This fits well with the components model (Griffiths, 2005) and loss of control (Billieux, 2014).

Differences Between Predictions and Results

The researcher was not correct in the predictions that were made. The researcher found gender was not predictive of IGD. Griffiths et al. (2015) explained that while many players with IGD are males this may be better attributed to sampling bias as gaming is a more popular past time with males. Billieux et al. (2015) predicted that the trend of male gamers has changed because women are taking up games as a pastime which is increasing feminization in the gaming community.

The researcher found guild membership was not predictive of IGD. This was surprising as they expected that players that were members of guilds would show higher IGD rates, but with the majority of players being the member of a guild this was proven to be false.

The researcher found that marital status and loneliness was not predictive of IGD. This was surprising because the researcher expected those who were single would be more likely to experience this disorder. This expectation was due to the stereotype of the socially dissatisfied gamer, however, as Herodotou et al, (2013) found in their study,

online gamers were a largely social group who use online gaming to supplement their social circle.

Implications for Counseling

Counselors working with individuals with IGD face many challenges and this was further illustrated by the issues the survey highlighted. The information on treatment of IGD is limited and previous clinical interventions include: cognitive behavioral therapy; pharmacological treatment; and individually tailored psychological interventions (Griffiths, Király, Pontes, & Demetrovics, 2015). Cognitive behavioral therapy has shown promise in past research, however, optimal treatment methods for IGD are still unknown as there are limited treatment options and a lack of controlled comparative studies between methods of treatment (Griffiths et al., 2015). The lack of comparative treatment methods is not because there is no demand for such services; in a survey of 229 mental health professionals, two-thirds reported treating individuals with IGD (Griffiths et al., 2015). Significant demand has been shown particularly in South-East Asia as there are multiple government funds on the subject; in South Korea there are more than 140 counseling centers devoted to the treatment of online addictions (Griffiths et al., 2015). The demand is not exclusive to South-East Asia: there is an increasing number of clinics in Europe and the United Kingdom (Griffiths et al., 2015).

The treatment of IGD is currently focused on the 11-17 age range though this is likely due to parental involvement and unwillingness of adults to seek treatment (Griffith et al., 2015). The treatment of adults with IGD is problematic as they may be less likely to seek help until other problems develop (Griffiths et al., 2015). The presence of concurrent disorders in this population is another issue and more research should be done

on adult populations and the concurrence of substance use, gambling, and mental disorders with IGD. The implications of the research for counselors is to start looking at the ecosystem of comorbidity when dealing with IGD and pay special attention to the presence of social anxiety.

Contribution to the Field

This research provides four core contributions to the understanding of IGD. The first contribution is through the use of multiple measures of this research shows that despite being predictive, none of the studied constructs were essential to IGD, although, it was found that social anxiety was a variable significant for both the IGD0 and IGD1 groups.

This research provided a second contribution in finding that multiple anecdotal variables were shown to be not predictive of IGD in this sample. These anecdotal variables include; being male, membership in a guild, and being single. Disproving these anecdotal variables as being predictive will allow future research to instead focus upon the most salient finding of the research.

The next contribution is that hours of play was found to be predictive of IGD. This finding was important because it reinforces past discussion around the components model of salience (Griffiths, 2005) and loss of control (Billieux et al., 2015). This contribution is important as it not only supports past research but is backed up by theory by leading researchers in this field.

The final contribution is that this research has made is the finding that class specialization was predictive of IGD. This contribution is novel and opens up additional lines of inquiry into the study of IGD. There is a possibility that certain types of players

who are more likely to develop IGD, a concept which is purely speculation at this point, but may bear fruit in the future.

Limitations

The survey provided valuable data set however, there were limitations to the data. The main limitation that is apparent to is the reliance upon the DSM-5 IGD criteria which is new and still requiring further research. The DSM-5 IGD criteria was chosen because of the widespread use of the DSM-5 as a tool by professionals in both clinical and academic settings in North America.

The presence of other unmeasured disorders is a limitation that was realized by after data collection was completed. This could have easily been fixed by including a question where the participant could have entered text on other different disorders they are diagnosed with. The researcher realized they had not accounted for this during the final stages of the data collection when a survey participant asked if their additional diagnosis of borderline personality disorder would invalidate their entry. Furthermore, the addition of screening tools for alcohol and other drugs could have added another dimension to the results.

The sample when compared to other studies was quite small (n=215) with 10.7% (n = 23) IGD prevalence. The participants were made up of a convenience sample collected from several different forums, online message boards, and locations frequented by gamers. This could be improved upon in future research by collecting a larger sample.

The incentive to fill out the survey was a 1 in 3 chance to receive an in-game pet from the Blizzard store. Pets hold financial value within the game for collectors with some selling for tens of thousands of gold pieces. Pets do not have a meaningful impact

gameplay as they are used as cosmetic items however, they may be used as part of a pet battling mini-game. Pet collection within WOW is not universally practiced, the sample may have been biased towards players who value and enjoy pet collection.

The last limitation was the possibility of erroneous data entered by participants. Erroneous data could have been entered inadvertently as well, a player may not have insight into the actual amount of time they play per week as loss of time is a common occurrence when gaming (Wood, 2007). The manifestation of this limitation was seen most clearly in the standard deviation for the hours played per week, where the standard deviation had high variation. Erroneous data could have been entered maliciously as part of the practice of internet "trolling" which is the practice of deliberate online harassment by an individual or a group.

Considerations for Future Research

This research informs future explorations in multiple ways. The greater presence of concurrent disorders in the IGD1 group compared to the IGD0 group is important in future study of IGD. It is apparent through this data that IGD does not exist as an isolated problem and has multiple points that need investigation, particularly in relation to social anxiety.

Future research should examine comorbid concurrent disorders within similar IGD1 and IGD0 groupings. This would allow researchers to look at the different levels of severity within the surveyed groups and similar surveys to this one could be conducted on a larger scale within different samples.

Future research should investigate on a qualitative experience of players with IGD and concurrent disorders; by investigating on a qualitative level one could create rich

narrative information on the subjective details such as existential despair. Furthermore, investigating individuals who have recovered from IGD could provide data in regards to what changes are likely to be a catalyst towards healing.

Qualitative research should be done to facilitate the study of family conflict and early childhood trauma and how it relates to IGD. This may be an important keystone in the understanding IGD and the ecosystem of comorbidity. The relationship between early childhood trauma and substance use disorders has been established through other studies (Khoury, Tang, Bradley, 2010; Maté, 2012), and the same should be performed with regards to IGD.

The last recommendation for future research on IGD is that the international community have consensus on what tool should be utilized and/or the creation of a unified tool for assessment of this disorder. The inclusion of IGD in the DSM-5 Section III was a landmark development and gave much needed recognition for those suffering from the disorder. Through the combined efforts of both clinicians experienced in assessment, researchers apt to explore the disorder, and scholar familiars with gaming culture; this could be achieved. The development of a standardized tool to differentiate disordered from non-disordered individuals would lead to leaps forward in the ability to identify the afflicted, recommend treatment, and examine the ecosystem of comorbidity.

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Appendix: Instruments

Demographics Survey

Gender: Male / Female
Age:
Country of current residence:
Relationship status: Single, Married, Widowed, and Separated/Divorced

Gaming Profile Survey

Server Type most commonly played on: RP, Normal, PVP, and RPPVP?
What is your Main Character's Class Specialization: Damage, Healing, and Tank?
What are your WoW Weekly game-play hours?
For your most commonly played character, do you belong to a guild?
How old were you when you started playing WoW?

DSM-5 Criteria for IGD

American Psychiatric Association. (2013)

Liebowitz Social Anxiety Scale Self Report (LSAS-SR)

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