Towards an Enriched Understanding of People Who Experience Problem Video Gaming

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Rehabilitation Science Institute
University of Toronto

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Abstract

Introduction: Video game addiction, also known as problem video gaming, is making headlines across the globe. Yet, our understanding of this relatively new phenomenon is limited. The purpose of this thesis is to develop an enriched understanding of people who experience problem video gaming. Methods: Two studies and a synthesis paper were completed. 1) A quantitative secondary analysis of survey data to determine the prevalence and correlates to problem video gaming. 2) A qualitative study using interviews and activity logs to understand the lives of people who experience problem video gaming from their own perspectives. 3) A synthesis of the two studies to facilitate a new discourse that broadens an understanding of problem video gaming. Results: Descriptive statistics found that 11.6% of youth experience problem video gaming. Logistic regressions revealed that the strongest predictors of problem video gaming were: being male, scoring lower in mental health status, playing more hours per day, being a problem gambler, receiving less parental monitoring, scoring lower in school subjective social status, not living in the East region of Ontario, not working outside of the home. People who experienced problem video gaming described playing video games as a meaningful and purposeful activity. A model that explains the push and pull influences on the amount of gaming is described. The synthesis of these results demonstrated that problem gaming behaviours are
influenced by issues arising not only in the individual, but also in interpersonal, and environmental circumstances. **Significance of Findings:** This thesis fosters new insights into the complexity of problem video gaming by explicating the interactions between the individuals who experience this, their interpersonal influences, and their environments. Consequently, the findings point to the importance of interpersonal and/or environmental issues which may have resulted in a misrepresentation of some gamers as being “addicted”.
Acknowledgments

The journey from clinician to researcher has not been without its challenges but it was also enjoyable and at times, even fun! Returning to graduate school has helped me reflect upon my personal and academic skills and weaknesses. It has pushed me to harness my strengths and use my earnest efforts to strengthen areas that were once overwhelmingly weak. There were several persons that helped accelerate my efforts to contribute to the successful completion of my PhD program:

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OSDUHS – Ontario Student Drug Use and Health Survey

PVP – Problem Videogame Playing Scale
Chapter 1 Introduction

*I never smoke to excess—that is, I smoke in moderation, only one cigar at a time.* –Mark Twain
(Torricelli & Carroll, Eds., 1999, pg.22)

Substitute the idea of “smoking” in the quote above with “playing video games” and it could reflect the thoughts of video gamers around the world. To many people who play video games, they are not playing excessively but enjoying one game at a time. Advances in technology and communications have resulted in countless benefits to people around the world. Consequently, it is now possible to make complicated calculations faster, write papers more efficiently, and perform intricate medical procedures. The availability of the Internet has also revolutionized the gaming industry through creative and engaging video games. Players who once played independently or against artificial intelligence programs are now able to challenge or play cooperatively with other players from around the world. A new term ‘gamer’ has been coined to describe people who frequently play such computer games, and from this group has emerged what some scholars argue is a new type of behavioural problem—problem video gaming.

Attempts to define problem gaming have been inconsistent. The first academic writings on the possibility of problem video gaming or “video game addiction” arose in the late 1990s after the release of a very popular Internet game called Ultima Online in 1997. It is generally accepted that problem gaming occurs when other areas of the individual's life are negatively impacted by his/her time spent gaming (Weinstein, 2010). According to the DSM-5 (American Psychiatric Association, 2013), problem video gaming or, “Internet gaming disorder”, is a condition requiring more research before it can be considered a formal disorder. It states that problem video gaming is the:

*Persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period:*

1. *Preoccupation with Internet games.*
2. Withdrawal symptoms when Internet gaming is taken away.
3. Tolerance—the need to spend increasing amounts of time engaged in Internet games.
4. Unsuccessful attempts to control the participation in Internet games.
5. Loss of interests in previous hobbies and entertainment.
6. Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. Has deceived family members, therapists, or others regarding the amount of Internet gaming.
8. Use of Internet games to escape or relieve a negative mood.
9. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games. (p. 795-798)

Furthermore, the World Health Organization put forth a tentative diagnosis—"gaming disorder"—for the upcoming International Classification of Diseases, ICD-11 that has sparked expert debate (Aarseth et al., 2017; van Rooij et al., 2018; World Health Organization, 2016). It is important to note that the gambling industry is also often referred to as the “gaming” industry, however, this dissertation refers to gaming as video games that are not designed as gambling games. Gambling typically involves risking money (or something of value) for a chance of winning more money in return. Gaming in the context of this dissertation means playing a game that is not typically played to win money. However, this does not exclude competitive video games that may result in monetary prizes. Problem gambling is not classified as problem video gaming. Although problem video gaming has not yet been formalized through the American Psychological Association nor the World Health Organization, it is a growing field of research that is gathering international attention due to the increasing economic and social scale of the gaming industry, the increasing amount of time individuals spend on games and the potential negative impacts on the lives of some problem gamers.

Such negative impacts or impairments can occur in many areas of life. Difficulties at work or at school are found to be severe in more than 50% of problem gamers (Chakraborty, Basu, & Kumar, 2010). Disruptions have also been documented occur in gamers’ social lives (Chappell, Eatough, Davies, & Griffiths, 2006; Kim, Namkoong, Ku, & Kim, 2008), health (Chahal, Fung, Kuhle, & Veugelers, 2013; Chappell et al., 2006; Smyth, 2007; Sublette & Mullan, 2012), and daily occupations (Chappell et al., 2006; Griffiths, Davies, & Chappell, 2004; Kim et al., 2008).
Furthermore, in some forms of online gaming, such as free-to-play games that have in-game micro-transactions, players accrue a financial loss that brings gambling and gaming disorders closer together, however, these loses are typically minimal compared to gambling loses. In extreme cases, the gamer neglects essential activities in daily life to the point of his or her own death as cited in Choi, Lee, Choi, & Kim (2007) and Christakis & Moreno (2009). These losses in productivity, health, and well-being are not only detrimental to individuals, they also have a negative impact on others’ lives and on our society. While the rate of participation in some other leisure activities tends to decline during the transition from youth to adulthood, engaging in gaming does not appear to follow this trend (Padilla-Walker, Nelson, Carroll, & Jensen, 2010). For young adults who are transitioning to new employment and family roles, high levels of online gaming may cause disruptions, as important activities that are required to fulfill these roles may be neglected.

Despite the growing body of evidence on the effects of problem video gaming, there are many gaps in knowledge in this area. These gaps can be divided into four main categories: demographics of problem gamers, measurement used in the identification of problem gamers, narrow conceptual frameworks to view problem video gaming, and methodologies used in research. First, the most obvious limitation in current literature in terms of demographics is that much of the research has been with male participants. Although a higher percentage of males experience problem gaming, a growing percentage of females also experience problem gaming (McLean & Griffiths, 2013). In fact, 41% of gamers are currently female and research is needed on this group (Entertainment Software Association, 2017). Also, much of the research to date on video gaming has focused on youth and adolescents. However, it is known that age ranges of people who play online games ranges from 11 to 68 years old (Sublette & Mullan, 2012). Problem video gaming can affect a wide range of age groups and more research is needed on adult gamers. Furthermore, youth and adult gamers who did not attend college are not well researched (Padilla-Walker et al., 2010). Possibly due to convenience, most of the research samples have been from school networks, which excludes gamers who have dropped out of school or have never attended school; a group which may include the most severe problem gamers.
A second limitation of the literature is that studies lack a consistent measurement of problem video gaming. Some scales lack distinguishing features between Internet addiction and problem gaming, such as the Young Internet Addiction Scale (Young, 1999) and the Compulsive Internet Use Scale (Meerkerk, Eijnden, Vermulst, & Garretsen, 2009). Both of these scales are frequently used in the study of problem video gaming. Other scales lack a refinement of cut-off scores to identify problem gamers. This limitation leads to variations in the identification of problem gamers studied and a high range of prevalence rates being reported. For example, a Dutch study using the Game Addiction Scale and subjective questions on problematic gaming behaviour found a prevalence of 1.3% (Haagsma, Pieterse, & Peters, 2012) while another study in Hong Kong using the same scale but a different approach to interpretation found a prevalence of 15.6% (Wang et al., 2014). In some cases, the measures might have misidentified non-problem gamers as problem gamers or problem gamers as non-problem gamers—these are false positives and false negatives (Turner et al., 2012). This limitation could be an effect of the lack of understanding of the phenomenon of problem video gaming itself. Much of the theoretical background for problem gaming research is borrowed from substance addictions or other behavioural addictions, such as gambling disorder. Although they provide a reasonable foundation for the study of problem video gaming, it cannot be assumed that problem video gaming is the same. Without potentially misleading assumptions from previous bodies of literature, more studies that seek to understand the problem video gaming phenomenon are needed.

The issue of understanding the phenomenon of problem video gaming leads to the third limitation in the literature: a narrow framework used to study video problem gaming. The dominant discourse in academic literature in problem gaming pertains to studying the deficits or “disease” in the individual problem gamer from mainly psychological (Young, 2009), neurobiological (Dong, Li, Wang, & Potenza, 2017), and behavioural perspectives (Griffiths, 2005). Environmental, and socio-cultural perspectives that shape the meaning and experiences of problem gamers have been largely neglected. As noted above, there has been some evidence that daily activities such as school, work, and sleep are impacted (Hellström, Nilsson, Leppert, & Slund, 2012; Sublette & Mullan, 2012), however, how they are affected remains unclear. The enablers and barriers to participation in daily activities other than gaming have also not been
examined. Therefore, research is needed to examine lived experiences that underpin problem video gaming and the meanings that are ascribed to video gaming.

The fourth and final limitation in current problem video gaming literature pertains to methodology. Most of the studies to date have been quantitative survey/questionnaire studies, although a few qualitative and mixed-methods studies are emerging. Questionnaire and survey studies cannot fully explore to what extent and how gamers experience the impacts of gaming on their lives. Alternative methods such as focus groups, in-depth interviews, and randomized-controlled trials are scarce or non-existent. A lack of diversity in methodologies used to study problem video gaming could result in a narrow knowledge base that lacks a deep and rich understanding of the experiences of problem gamers. The best way to gain a deeper and more complex understanding of the occupational lives of addicted gamers is through qualitative research. Qualitative research seeks to understand a phenomenon, in this case problem video gaming, from the perspective of those who are experiencing the addiction. It can be used to explore a phenomenon and build theory (Strauss & Corbin, 1998).

This dissertation aims to address these four limitations in problem video gaming literature. Both males and females in a wide age range—from youth to adults—regardless of occupation or school status are captured. The studies completed as part of this dissertation use the same measure (Problem Videogame Playing Scale) to identify problem gamers across all studies and therefore, has a consistent form of measurement (Tejeiro Salguero & Moran, 2002). It also uses the broader social ecological model as a framework to collect and analyze data to contribute new complex and nuanced knowledge to the literature. Furthermore, this dissertation addresses limitations in methodology through the triangulation of both qualitative and quantitative methods. The intent of this dissertation is to gain a deeper and more complex understanding of the lives of problem video gamers than is currently available in the literature. It investigates the following research question: What are the characteristics and daily life experiences of problem video gamers? The sub-questions include: What is the prevalence of problem video gaming? What characteristics are associated with problem gamers? What motivates them to play? From their own perspectives, what supports and constraints do they have for engagement in other life activities? The next sections briefly describe subsequent chapters within this dissertation.
Chapter 2 examines the prevalence of problem video gaming, characteristics of gamers and the correlates to problem video gaming. This quantitative study is a secondary analysis of data collected through the Ontario Student Drug Use and Health Survey (OSDUHS), cycle 2015, conducted with Canadian youth, ages 12-19 which captures responses from an almost equal numbers of male and female participants. Twenty-four variables were examined in the areas of individual, interpersonal, organizational, and community factors. The strongest predictors of problem video gaming are discussed.

Chapter 3 delves into a deeper understanding of problem video gamers through a qualitative study. There were no exclusion criteria related to demographics for this study with the exception that the problem gamers had to be over the age of 16. Recruitment ads were posted at a large mental health hospital and online. This method yielded a worldwide sample where eligible participants completed activity logs for one week prior to being interviewed. They participated in semi-structured interviews to gain an understanding of their lives from their own perspectives. Findings from this study describe influences on the amount they play and the meanings they attribute to video gaming.

Chapter 4 synthesizes the results of the two previous studies using a broad conceptual framework. A social ecological model is used to integrate the findings from the quantitative and qualitative studies. The synthesis of these results demonstrates that problem gaming behaviours are influenced by issues arising not only in individual, but also in interpersonal, and environmental circumstances. Thus, some gamers may be misrepresented as being “addicted” when it is external factors that should be the main concern.

Finally, Chapter 5 highlights the implications and key messages of the thesis. This chapter will also discuss recommendations for future research with concluding remarks.
References


Dong, G., Li, H., Wang, L., & Potenza, M. N. (2017). Cognitive control and reward/loss processing in Internet gaming disorder: Results from a comparison with recreational
doi:https://doi.org/10.1016/j.eurpsy.2017.03.004


Chapter 2
Are individual, interpersonal, organizational, and community factors associated with problem video gaming?

2.1 Abstract

**Background:** Problem video gaming can negatively impact other essential life activities. The social ecological model provides a framework for an in-depth understanding of the various factors that impact problem video game play in youth. This study aims to determine the prevalence and correlates of problem video gaming in youth. **Methods:** Problem gamers were identified using the Problem Videogame Playing Scale in an in-class survey among 5,258 youth. **Results:** Close to 9% of males and 3% of females sampled were identified as problem gamers. The strongest predictors of problem video gaming were problem gambling (OR=17.01, CI=4.8-60.29), sex (OR=4.81, CI=.87-1.49), self-reported mental health (OR=1.24, CI=1.03-1.48), hours spent gaming (OR=1.82, CI=1.59-2.08), parental monitoring (OR=1.26, CI=1.03-1.56), school subjective social status (OR=.88, CI=.8-.92), geographical region (OR=.5, CI=.31-.82), and working outside of the home (OR=.44, CI=.29-.67). **Discussion and Conclusions:** These results contribute to a deeper understanding of problem video gaming at an individual and environmental level. Multiple areas of intervention are recommended by this study, such as addressing gambling within video games, teaching alternative coping skills, education on the importance of parental monitoring for parents/caregivers, strengthening online gambling regulations, developing in-person social skills among youth, assisting with meaningful work/volunteer opportunities, and expanding or modifying community services to support youth in at-risk groups mentioned above. Early identification and targeted interventions for problem video gamers are recommended.

**Keywords:** video games; computer games; addictive behavior; game addiction; adolescent; prevalence
2.2 Introduction

Recent concerns regarding problematic video gaming have drawn increasing interest from academia, the media, and the World Health Organization. Problem video gaming can be defined as a loss of control over excessive video game play, leading to clinically significant impairment (American Psychiatric Association, 2013) including psychological distress and functional impairment (Shapira et al., 2003). Problem gamers have been shown to have higher rates of depression (Langley, 2010), and poorer psychological well-being (Devine & Lloyd, 2012) compared to those who are non-problem gamers. Of particular interest, is how excessive amounts of time spent playing video games interferes with other life activities (Chakraborty, Basu, & Vijaya Kumar, 2010). The prevalence of problem video gaming has been reported to be anywhere from 1.4% to as high as 25% among youth (Brunborg et al., 2013; Seok & DaCosta, 2012; Van Rooij, Schoenmakers, Vermulst, Van den Eijnden, & Van de Mheen, 2011). Moreover, some types of games may be more problematic than others (e.g. open-world games like World of Warcraft) and attract people with different demographics (e.g. more males play first-person-shooters) (Hussain & Griffiths, 2008; Yee, 2006). Consequently, making generalizations about problem gaming have been difficult.

Several factors are known to influence the choices and behaviours of youth, such as individual, family, school, and community factors (DiClemente, Salazar, Crosby, & Rosenthal, 2005), and thus, may contribute to problem video gaming. However, the study of problem gaming has been limited by either a focus on the individual (Kuss & Griffiths, 2012) or a few interpersonal factors (Kwon, Chung, & Lee, 2011; Stavropoulos, Kuss, Griffiths, Wilson, & Motti-Stefanidi, 2017). Other contextual factors examined in the literature have included school and work attendance and unemployment (Chappell et al., 2006; Hellstrom, Nilsson, Leppert, & Aslund, 2012; Kim, Namkoong, Ku, & Kim, 2008). Most often only one or two factors are examined at the same time, limiting the scope of study of this complex behaviour. Such a bisected approach to understanding problem gaming does not provide an overall understanding of the complexity of this phenomenon.

Social ecological models broaden our attention from individual to interpersonal and environmental factors. These models have been widely used in public health. For example, when previously used to understand teenage pregnancies, a social ecological model helped point to a
need for interventions that address the multifaceted aspects of interactions between the adolescent mothers, their family/peers, community, and social system (Raneri & Wiemann, 2007). Social ecological models have also been used to study factors associated with substance use that go beyond individual characteristics to reveal that external factors such as parental drinking and availability of substances are also risk factors among high school students (Connell, Gilreath, Aklin, & Brex, 2010). Because social ecological models acknowledge that humans live within changing environments and larger social contexts (Bronfenbrenner, 1977), they hold great promise for understanding multiple factors influencing video game addiction. An adaptation of a social ecological model, widely used in public health, examines five factors of influence—individual (personal characteristics and behaviours), interpersonal (relationships with family and friends), organizational (formal and informal organizations), community (larger environmental area where previous factors interact), and public policy (local to national level laws and policies) (Golden & Earp, 2012; McLeroy, Bibeau, Steckler, & Glanz, 1988). This adapted model also assumes interrelationships among environmental conditions, human behaviours, and well-being (Stokols, 1996). Results from studies underpinned by social ecological models are often more relevant and generalizable than a purely one-faceted approach (Bronfenbrenner, 1977) and allow us to incorporate many different factors for a more complex understanding of social issues such as problem video gaming.

This study seeks to examine the prevalence of problem video gaming and uses a social ecological approach to guide the selection of characteristics as relevant predictors. Included for examination are the individual, interpersonal, organizational, and community factors. However, this study does not seek to test the social ecological model, but rather to explore how it can help us better understand problem video gaming. Consequently, the following research questions are addressed: What is the prevalence of problem video gaming among youth? What are the best predictors of problem video gaming as guided by social ecological factors?

2.3 Methods

The Ontario Student Drug Use and Health Survey (OSDUHS), cycle 2015, surveyed over 150 elementary and secondary schools in Canada’s most populous province to address health and drug use related factors. Administered by the Institute for Social Research at York University, it has been conducted bi-annually since 1977, completed by students in class. Data collection for
the 2015 OSDUHS was approved by the Research Ethics Boards at the Centre for Addiction and Mental Health and York University. It was also approved by the Research Review Committees of 30 school boards within Ontario (Boak, Hamilton, Adlaf, Henderson, & Mann, 2016). This regionally-stratified survey employed a two-stage cluster (school and class) design and the 2015 cycle is a representative sample of 10,426 students in grades 7 to 12 in Ontario (Boak et al., 2016). Student participation required consent from the school boards, principals, teachers, and parents (for those under 18 years), and students themselves; the student response rate was 59% (Boak et al., 2016). Multiple versions of the survey were employed so that not all students received all questions. Approximately half of the students (N=5,258) were randomly selected to answer questions on video gaming. Video games in this study refers to all types of video games that can be played through any medium (console, computer, etc.) except for games where the central purpose is to gamble.

Variables in this study were selected according to their alignment with the social ecological model (Table 2.1) and are discussed below. As some variables may fit with more than one factor within the model, all authors came to a consensus on the allocations of the variables according to closest fit (e.g. delinquency could be an individual factor, however, delinquent acts are often committed against the rules/policies of an organization and was therefore, placed in the organizational factor). The sections below will discuss the measurement instruments embedded within the OSDUHS with brief descriptions. More details about each instrument can be found in Boak et al. (2016).
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</tr>
<tr>
<td>Interpersonal</td>
<td>Interpersonal relationships with family and friends</td>
<td>Home arrangement, immigrant/non-immigrant family, family subjective social status, victim of being bullied at school, being a bully at school, victim of cyberbullying, and parental monitoring.</td>
</tr>
<tr>
<td>Organizational</td>
<td>Formal and informal organizations</td>
<td>Scholastic achievement, school subjective social status, and delinquency.</td>
</tr>
<tr>
<td>Community</td>
<td>Larger environmental area where all other factors interact</td>
<td>Region, mental health care visits, and hours worked outside of the home.</td>
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### 2.3.1 Measurement to Identify Problem Gamers

The Problem-Video Game Playing Scale (PVP) was used in this secondary analysis study to identify problem gamers. The PVP has been recommended as the best measure of problem video gaming to date (King et al., 2013). It has an acceptable internal consistency, item scores have a reliability coefficient (α) of .77 (Boak et al., 2016; Tejeiro Salguero & Moran, 2002) and it demonstrated strong convergent validity (King et al., 2013). In terms of reliability, the PVP is the only scale that demonstrated a factor structure that was confirmed in a follow-up study without contrasting findings (King et al., 2013). A cut-off score of five out of nine items was used in this study as it has been used in previous research to determine the prevalence of problematic gaming (Bioulac, Arfi, & Bouvard, 2008; Turner et al., 2012).
2.3.2 Individual factors

Age (12 to 19 years old), sex (male or female), education level (grades 7 to 12), and hours of gameplay (less than 1 hr., 1hr., 2hrs., 3-4hrs., 5-6hrs., and more than 7hrs. per day) were measured. A single item measure of self-rated mental health has been found to be a straightforward and useful way of measuring mental health in a population survey (Mawani & Gilmour, 2010). Responses were recorded on a six-point scale from “poor” to “excellent”. A single item measure of self-esteem was adapted from the Rosenberg Self-Esteem Scale with an alpha reliability of .88 (Robins, Hendin, & Trzesniewski, 2001; Rosenberg, Schooler, & Schoenbach, 1989). Those who “strongly disagreed” with the statement, “on the whole, I am satisfied with myself” were considered to have low self-esteem. A single item measure of self-rated physical health was used as it has been found to be a reliable and valid measure of physical health among youth (Fosse & Haas, 2009).

Substance dependence was measured by CRAFFT, a behavioral health screening tool for use with youth under the age of 21 (Children’s Hospital Boston, 2009). Those who responded “yes” to three or more out of the six questions were categorized as substance dependent. The CRAFFT was found to be a reliable and valid tool with adolescents (Kandemir et al., 2015; Levy et al., 2004). Alcohol dependence was measured by the Alcohol Use Disorders Identification Test (AUDIT) which demonstrated a reliability coefficient (α) of 0.84 in this sample. Consistent with recommendations for screening for alcohol dependence, students were categorized as alcohol dependent if their scores were 20 or higher out of a maximum of 40 (Babor, Higgins-Biddle, Saunders, & Monterio, 2001). Problem gambling was determined by the South Oaks Screen Revised for Adolescents (SOGSRA). Youth endorsing two or more out of the six items were classified as having a gambling problem with a reliability coefficient (α) of .71 (Cook et al., 2015).

2.3.3 Interpersonal factors

Home arrangement (living in a single home vs. split between more than one home) and being from an immigrant or non-immigrant family were asked in the survey. Family subjective social status was measured using the MacArthur Scale of Subjective Social Status (from a low of one to a high of ten) with a test-retest reliability correlation coefficient of .62 (Goodman et al., 2001; Karvonen & Rahkonen, 2011; Operario, Adler, & Williams, 2004). A single item measure of
parental monitoring was employed by asking whether one of their parents knew their whereabouts when being away from home on a five-point scale from “always” to “never”. Students were asked whether they experienced being a victim of bullying at school, being a bully at school, or a victim of cyber-bullying within the current school year.

2.3.4 Organizational factors

All school (formal organization) related variables was categorized under organization factors. Scholastic achievement was a self-reported measure from below 50% to 100%. School subjective social status was a self-reported measure of perceived status at school. This measure was based on the MacArthur Scale of Subjective Social Status to determine a ranking of social hierarchy (from a low of one to a high of ten) and has demonstrated excellent reliability among adolescents (Goodman et al., 2001; Sweeting & Hunt, 2014). Delinquency, often viewed as an individual factors is part of the organizational factor in this study due to the social and societal context in which “delinquent” behaviours occur. Delinquency was determined to have occurred by endorsing three or more of ten items that measured violent or non-violent delinquent behaviours (Cook et al., 2015). The delinquency questions included items such as carrying a weapon such as a gun or knife to school and running away from home.

2.3.5 Community factors

Regions of the province of Ontario in the sample were divided into the following boundaries: Toronto (city), North (Parry Sound District, Nipissing, District, and areas farther North), West (Peel District, Dufferin County, and areas farther West); and East (Simcoe County, York County, and areas farther East). Mental health care visits were based on a single question, “in the last 12 months, how often have you seen a doctor, nurse, or counsellor about your emotional or mental health?”. Hours worked outside of the home per week were also self-reported in four hour intervals.

2.3.6 Statistical analysis

Separate logistic regressions were run for all the variables defined in individual, interpersonal, community, and organizational factors with problem video gaming as defined the PVP. All variables that were significantly associated with PVP in univariate analyses were entered into a logistic regression for the best predictive variables to problem video gaming. Four variables were
only on one version of the survey, therefore, they had fewer cases than all other variables: alcohol dependence, substance dependence, problem gambling, and working outside of the home. Those questions were presented only to older adolescents in grades 9 to 12 in this cycle of the OSDUHS. Therefore, casewise deletion was used and the final logistic regression for all significantly correlated variables had a final sample size of 3,075 students in Stata 14 software package. All tests were run with 95% confidence intervals and results were considered statistically significant at \( p = 0.05 \).

2.4 Results

2.4.1 Description of sample

A total of 5,137 youth were sampled with the PVP where 450 (8.8%) males sampled were experiencing problem video gaming while 147 (2.9%) females sampled were experiencing problem video gaming. Grade 11 had the highest ratio of problem gamers at 12.7% while grade 7 had the lowest ratio of problem gamers at 10.3%. However, there were no clear patterns of problem gaming by grade levels (Table 2.2: Problem and non-problem gamers by sex grade).

Table 2.2: Problem and non-problem gamers by sex & grade

<table>
<thead>
<tr>
<th></th>
<th>Non-problem gamers</th>
<th>Problem gamers</th>
<th>( \chi^2 ) tests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=2,343)</td>
<td>1893 (36.9%)</td>
<td>450 (8.8%)</td>
<td>241.3***</td>
</tr>
<tr>
<td>Female (n=2,794)</td>
<td>2647 (51.5%)</td>
<td>147 (2.9%)</td>
<td></td>
</tr>
<tr>
<td><strong>Grade</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 (n=852)</td>
<td>764 (14.9%)</td>
<td>88 (1.7%)</td>
<td>4.1</td>
</tr>
<tr>
<td>8 (n=963)</td>
<td>843 (16.4%)</td>
<td>120 (2.3%)</td>
<td></td>
</tr>
<tr>
<td>9 (n=889)</td>
<td>794 (15.5%)</td>
<td>95 (1.8%)</td>
<td></td>
</tr>
<tr>
<td>10 (n=853)</td>
<td>756 (14.7%)</td>
<td>97 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>11 (n=787)</td>
<td>687 (13.4%)</td>
<td>100 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>12 (n=792)</td>
<td>695 (13.5%)</td>
<td>97 (1.9%)</td>
<td></td>
</tr>
</tbody>
</table>

\( a \) Percentage of total sample

* \( p < 0.05 \). ** \( p < 0.005 \). *** \( p < 0.001 \).
2.4.2 Prevalence of problem video gaming in youth

The descriptive statistics show that 11.6% of youth currently experience problem videogaming. The prevalence of problem video gaming among only those who played video games (2,263 males and 2,160 females) was 13.3% where 590 participants (144 females) reported problem gaming.

2.4.3 Social ecological predictors of problem video gaming

Individual, interpersonal, organizational, and community factors were explored as defined by the variables listed in the Methods section (Table 2.3: Separate logistic regressions for all variables with problem video gaming). There were eight significant correlations to problem video gaming among individual factors: age, sex, education level, problem gambling, self-rated mental health, self-esteem, self-rated physical health, and hours of gameplay ($p<.05$). There were six significant correlations with problem video gaming among interpersonal factors: family immigration, family subjective social status, parental monitoring, victim of bullying at school, being a bully at school, and victim of cyber-bulling ($p<.05$). There were three significant correlations among organizational factors: scholastic achievement, school subjective social status, and delinquency ($p<.05$). Finally, there were two significant correlations among community factors: region and hours worked outside of the home ($p<.05$).
Table 2.3: Separate logistic regressions for all variables with problem video gaming

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>SE</th>
<th>OR</th>
<th>p</th>
<th>95% confidence interval for OR</th>
<th>Lower bound</th>
<th>Upper bound</th>
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<td></td>
</tr>
<tr>
<td>Age</td>
<td>5137</td>
<td>0.03</td>
<td>1.07</td>
<td>0.039</td>
<td>1.00</td>
<td>1.14</td>
<td></td>
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<tr>
<td>Sex (female)</td>
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<td>0.000</td>
<td>0.14</td>
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<tr>
<td>Education level</td>
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<td>1.07</td>
<td>0.045</td>
<td>1.00</td>
<td>1.15</td>
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<td>Substance dependence</td>
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<td>0.30</td>
<td>1.41</td>
<td>0.111</td>
<td>0.92</td>
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<td>Alcohol dependence</td>
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<td>0.080</td>
<td>0.43</td>
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<td>Problem gambling</td>
<td>3312</td>
<td>7.80</td>
<td>17.87</td>
<td>0.000</td>
<td>7.52</td>
<td>42.47</td>
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<td>Self-rated mental health</td>
<td>5119</td>
<td>0.06</td>
<td>1.34</td>
<td>0.000</td>
<td>1.22</td>
<td>1.47</td>
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<tr>
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<td>0.49</td>
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<td>0.000</td>
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<td>3.45</td>
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<td>1.38</td>
<td>1.77</td>
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<td>Hours of gameplay</td>
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<tr>
<td>Home arrangement (split homes)</td>
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<td>Family subjective social status</td>
<td>5077</td>
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<td>0.83</td>
<td>0.000</td>
<td>0.78</td>
<td>0.89</td>
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<tr>
<td>Parental monitoring</td>
<td>5119</td>
<td>0.11</td>
<td>1.46</td>
<td>0.000</td>
<td>1.26</td>
<td>1.70</td>
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<td>Victim of bullying at school</td>
<td>5106</td>
<td>0.24</td>
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<td>1.46</td>
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<td>Being a bully at school</td>
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<td>Victim of cyber-bullying</td>
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<tr>
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<td>Scholastic achievement</td>
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<td>0.001</td>
<td>1.12</td>
<td>1.52</td>
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<tr>
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<td>0.53</td>
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<td>0.42</td>
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<tr>
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<td>0.49</td>
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<td>1.45</td>
<td>3.44</td>
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<tr>
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<tr>
<td>Region</td>
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</tr>
<tr>
<td>East</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mental health care visits</td>
<td>5105</td>
<td>0.15</td>
<td>0.93</td>
<td>0.637</td>
<td>0.67</td>
<td>1.28</td>
<td></td>
</tr>
<tr>
<td>Hours worked outside of the home</td>
<td>3312</td>
<td>0.08</td>
<td>0.47</td>
<td>0.000</td>
<td>0.34</td>
<td>0.66</td>
<td></td>
</tr>
</tbody>
</table>

Note: references categories for family immigration was “both parents born in Canada”, and for region was “Toronto”. 
2.4.4 The strongest predictors of problem video gaming

A multivariate logistic regression was run for all variables that were significant in the univariate regressions. The following variables were found to be the best predictors of problem video gaming in youth: sex, self-rated mental health, hours of gameplay, problem gambling, parental monitoring, school subjective social status, geographical region, and hours worked outside the home, holding other variables constant (Table 2.4). Males were 4.8 times more likely (CI=2.8-8.29) to experience problem gaming than females. For every one-point lower that an adolescent scored in self-reported mental health, they were 1.2 times more likely (CI=1.03-1.48) to experience problem gaming. For each unit increase in the hours played per day (less than 1 hr., 1hr., 2hrs., 3-4hrs., 5-6hrs., and more than 7hrs. per day), youth were 1.8 times more likely (CI=1.59-2.08) to experience problem gaming. Being a problem gambler was also a significant predictor where the youth were 17 times more likely (CI=4.8-60.29) to experience problem gaming than those who did not score as problem gamblers. For each unit decrease of parental monitoring (“always”, “usually”, “sometimes”, “rarely”, and “never”), youth were 1.3 times more likely (CI=1.03-1.56) to experience problem gaming. For every one-point higher in school subjective social status, youth were 1.1 times less likely (CI=.8-.92) to experience problem gaming. Youth who lived in the East region of Ontario (Simcoe County, York County, and areas farther East) were half as (CI=.31-.82) likely to experience problem gaming as those who lived in Toronto (Canada’s largest city). Finally, for every four hours that youth worked outside of the home, they were almost half as likely (CI=.29-.67) to experience problem gaming compared to those who did not work.
Table 2.4: Multivariate logistic regression analysis predicting problem video gaming in youth who play video games (N=3,075)

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>B</th>
<th>SE</th>
<th>95% confidence interval for OR</th>
<th>Lower bound</th>
<th>Upper bound</th>
</tr>
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<tbody>
<tr>
<td><strong>Individual</strong></td>
<td></td>
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</tr>
<tr>
<td>Age</td>
<td>1.14</td>
<td>0.13</td>
<td>0.15</td>
<td>0.87</td>
<td>1.49</td>
<td></td>
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<tr>
<td>Sex (male)</td>
<td>4.81</td>
<td>1.57***</td>
<td>1.32</td>
<td>2.80</td>
<td>8.29</td>
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<tr>
<td>Education level</td>
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<td>-0.07</td>
<td>0.15</td>
<td>0.68</td>
<td>1.27</td>
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<tr>
<td>Self-rated mental health</td>
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<td>0.21*</td>
<td>0.11</td>
<td>1.03</td>
<td>1.48</td>
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<tr>
<td>Self-esteem</td>
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<td>0.55</td>
<td>0.56</td>
<td>0.91</td>
<td>3.28</td>
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<tr>
<td>Self-rated physical health</td>
<td>1.07</td>
<td>0.07</td>
<td>0.10</td>
<td>0.89</td>
<td>1.29</td>
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</tr>
<tr>
<td>Hours of gameplay</td>
<td>1.82</td>
<td>0.6***</td>
<td>0.12</td>
<td>1.59</td>
<td>2.08</td>
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<tr>
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<td>2.83***</td>
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<td>Family immigration</td>
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<td>0.13</td>
<td>1.03</td>
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<td>0.26</td>
<td>0.91</td>
<td>1.96</td>
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<td>Being a bully at school</td>
<td>1.55</td>
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<td>0.31</td>
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<td>-0.82***</td>
<td>0.09</td>
<td>0.29</td>
<td>0.67</td>
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</table>

*p < .05. **p < .01. ***p < .001. OR=Odds ratio. All variables were entered simultaneously.

Note: reference categories for family immigration was “both parents born in Canada” and for region was “Toronto”.
2.5 Discussion

Individual, interpersonal, institutional, and community factors in social ecological models were found to predict problem gaming in youth. The current study, which sampled males and females almost equally, found that males were almost five times more likely to experience problem gaming. There is longstanding research demonstrating that males play more video games and play for longer hours than females and, are therefore, more likely to be included in research studies of problematic video gaming (Demetrovics et al., 2012; Jansz & Tanis, 2007; Van Rooij et al., 2011). Thus, this research supports targeting male youth as a priority for preventing or reducing the negative effects of problem gaming.

The finding that youth who experienced problem gambling were 17 times more likely to demonstrate problem video gaming was a novel predictor uncovered by this study that warrants further investigation. A major concern regarding this correlation is that the present sample consisted of youth—most of whom are under the legal age for gambling (19 years old) in the province of Ontario, Canada. This staggering correlation may be related to the recent emergence of e-sports gambling in which video game tournaments are treated as sporting events and have now become a target for sports gambling. The line between gaming and gambling are being further blurred with markets which have opened for trading in-game value items for real currency. The video gaming industry could consider strengthening protocols for engaging in e-sports gambling and more emphasis should be placed on this important emerging trend.

Also, at the individual level, this study found poorer self-reported mental health was a predictor of problem video gaming. Youth who have poorer mental health status might be using video games as a method of coping with depression or anxiety (Loten, Borkoles, Lubman, & Polman, 2016). Whether this is a maladaptive strategy is an issue that needs to be explored. However, based on the finding that video gaming is more prominent with those who experience poorer mental health, this study’s recommendation that there is a need to help youth develop coping skills is consistent with previous research. Counselors who work with problem gamers should first evaluate mental health issues among youth and then educate them about other more established methods of coping such as meditation (Hofmann, Sawyer, Witt, & Oh, 2010) or recommend therapy (Cuijpers, Donker, van Straten, Li, & Andersson, 2010). Providing youth
with alternative coping strategies and simultaneously educating them on mental wellness may deter some from developing problem video game use.

This study found that youth who identified with having lower social status (or were less popular) at school were at greater risk of being problem gamers. A lower social status at school is in part related to the fact that these youth are more socially withdrawn (Rubin, Coplan, & Bowker, 2009). A lower social status at school could also be because youth who prefer online social interaction rather than face-to-face social interaction experience higher degrees of self-identified loneliness, and lower offline social support (Leung, 2011). This is congruent with previous research that found that young adults who preferred online social interaction rather than face-to-face communication were more likely to experience problematic gaming symptoms (Männikkö, Billieux, and Kääriäinen, 2015). Moreover, Colder Carras et al., (2018) suggested a feedback cycle where social anxiety spurs excessive gaming and social isolation leading to more anxiety. Programs aimed at problem gamers could introduce social skills training to support and encourage inclusion at school.

Predictors of problem gaming identified in this study may be interrelated. For example, youth who are working outside of the home are spending fewer hours engaged in gameplay which may help to reduce problematic play. Thus, interventions focused on assisting youth to gain employment or volunteer opportunities outside of the home may reduce problem gaming. Additionally, stakeholders can advocate for community businesses and organizations to increase work and/or volunteer opportunities that engage youth. Parents/caregivers could also be educated on the importance of parental monitoring (or knowing their child’s whereabouts) as a significant predictor of problem video gaming. Together, these strategies could help facilitate greater community integration and less time spent at home playing video games.

Although family immigration status was non-significant in the multivariate model, it was a significant predictor of problem gaming in univariate regression. When neither parent was born in Canada, youth were more likely to experience problem video gaming. Immigrants usually are unaware of available supportive resources and lack supportive social networks (Hynie, Crooks, & Barragan, 2011). They might also experience difficulties adjusting to the culture and social systems of a new country while being burdened by economic and time constraints (Hynie, Crooks, & Barragan, 2011). Parents/caregivers who are facing similar challenges may be unable
to offer the monitoring or guidance needed by some youth. Countless other difficulties might also present themselves to immigrant youth, for example, language barriers, alienation, discrimination, etc. (Fang, 2011). Interestingly, first-generation immigration accounts for 43.2% of the population growth in Toronto, but only 10% for the East regions (Durham Region, 2015, p.4). In this study, youth in the East region of Ontario were half as likely to experience problem video gaming than youth who lived in Toronto. These findings suggest that community-based programs and access to supportive resources should be implemented in higher immigration regions.

There are several limitations to this research that should be considered. Surveys typically lack in-depth detail of personal accounts which could be elicited through qualitative research designs. Additionally, the cross-sectional nature of this study design did not allow for examination of causality of the predictor variables. Limitations are also associated with retrospective responses such that there may be unintentional error in recalling information related to survey questions (Bernard, Killworth, Kronenfeld, & Sailer, 1984). Finally, future studies should include youth who are not only attending public schools but also youth who leave school, are home-schooled, or are in alternative school systems. Capturing a population who is currently not enrolled in school would be more likely to include those with the most severe functional impairments (Van Rooij & Kardefelt-Winther, 2017). Despite these limitations, the findings from this study found predictors of problem video gaming that encompassed a wide range of factors. While it is important to examine youth who have problem gaming from an individual perspective, a broader environmental context as suggested by the social ecological model provides an integrated framework. Such an approach is critical to designing and implementing interventions for youth who experience problems with video gaming. Assessing and targeting multifaceted factors in youth and their environments may help them address problem gaming or prevent them from engaging in problem gaming.

2.6 Conclusion

This study found that individual, interpersonal, institutional, and community factors predicted problem gaming in youth. Problem gamers were more likely to be male, have lower self-reported mental health, and played more hours per day. They are less likely to experience problem video gaming if they have higher levels of parental monitoring, live in the East region of Ontario, have
a higher self-reported social status at school and worked outside of the home. Particularly, the finding of a strong relationship between problem gambling and problem gaming (OR=17.01, CI=4.8-60.29) warrants more attention in future studies.

Employing a social ecological perspective to guide analyses of data contributed to a more complex understanding of the predictors for problem video gaming among youth. Valuable new insights gained from this study can stimulate future research and policy for this new social problem. Variables identified by the predictive model in this study can be target areas for the early identification and prevention of problem video gaming. Youth and their caregivers in these at-risk groups should be made aware of problem video gaming and risk factors for this behaviour. Findings guided by the social ecological model may be useful in providing a contextual overview of problem video gaming for program developers, policy makers, school boards, and other stakeholder groups. Interventions should target multiple areas such as addressing gambling within video games, teaching alternative coping skills, education on the importance of parental monitoring for parents/caregivers, strengthening online gambling regulations, developing in-person social skills among youth, assisting with meaningful work/volunteer opportunities, and expanding/modifying community services to support youth in at-risk groups mentioned above. Evaluation of such interventions can be conducted in future research to test their effectiveness and to assess their value.
References


Chapter 3
Understanding the lives of problem gamers: The meaning, purpose, and influences of video gaming

3.1 Abstract

The literature reveals a fragmented understanding of the daily lives of problem gamers. This study takes a social ecological approach towards a more holistic understanding. Specifically, it examines what is important to problem gamers, what shapes their gaming behavior, and what supports/constrains their engagement in other life activities. In-depth semi-structured interviews and week-long activity logs were used to collect data from the 16 problem gamers in five countries. Qualitative data were analyzed thematically. Two main themes emerged, each with sub-themes: 1) gaming as meaningful and purposeful, and 2) push/pull influences on the amount of gaming. Influences that pulled problem gamers toward gaming included: socialization/friendships, enjoyment, sense of community, opportunity to exert control, creativity, challenge, relaxation, and filling idle time. They were also motivated to game to cope with other life stressors, to appreciate the game design, and when they were too tired/lazy/unable to do anything else. Supports that pushed gamers away from gaming included: finding a sense of responsibility and meaningfulness in other activities, planning/scheduling other activities, co-habitants/friends/co-workers, online resources, therapy, spirituality, joining community clubs, change of physical setting, wanting real-life interaction/avoid toxic online players, and decreased access to games. This study found that problem gamers experience both positive and negative impacts on their lives from gaming. The push/pull influences act together to regulate the amount of gaming that they engage in.

Keywords: video games; computer games; social ecology; addictive behavior; game addiction; qualitative research
3.2 Introduction

The popularity of playing video games has grown immensely over the past decade. Approximately half of Americans play video games on various electronic devices while 10% of those who play self-identify as being a “gamer” (someone who consistently plays video games and identifies with the gaming community) (Pew Research Centre, 2016). A growing body of research has found positive uses for video games (Ferguson, 2010), including reducing flashbacks from posttraumatic stress disorder (Holmes, James, Coode-Bate, & Deeprose, 2009), reducing chronic pain (Jones, Moore, & Choo, 2016), training of health care professionals (Wang, DeMaria, Goldberg, & Katz, 2016) improved visual-spatial cognition (Spence & Feng, 2010), arithmetic, memorization, leadership, and team functioning (Thirunarayanan & Vilchez, 2012). However, it is also known that problems may arise when video game playing is excessive.

In Canada, a survey study using the Problematic Videogame Playing Scale (PVP) (Tejeiro Salguero & Moran, 2002) found that 9.4% of adolescent gamers experience problematic gaming with 1.9% being described as having severe problems (Faulkner, Irving, Adlaf, & Turner, 2014; Turner et al., 2012). Although there is ongoing debate about whether problem gaming is an actual disorder (Aarseth et al., 2016), it is generally understood that problem gaming is not necessarily “addicted” gaming.

Problem gaming can be defined as a persistent and recurrent involvement in video gaming that results in psychological distress and functional impairment (American Psychiatric Association, 2013; Shapira et al., 2003). The importance of functional impairment was emphasized by gamers in a mixed methods study conducted at a video game convention in the USA, in which gamers agreed that functional impairment was the top sign of problematic gaming (Colder Carras et al., 2018). Among the functional issues reported were: neglecting their own needs/responsibilities, a loss of interest in previous hobbies/activities, impacts on self-care activities, and failing in school/work (Colder Carras et al., 2018). Several other studies have identified productivity issues at work and school (Cole & Griffiths, 2007; Gentile, Lynch, Linder, & Walsh, 2004; Hastings et al., 2009; Hellström, Nilsson, Leppert, & Slund, 2012). Although the implications of functional impairment in activities relating to gamers’ lives have some very practical repercussions and are directly related to well-being, function has generally not been the focus of research studies.
Currently, a full appreciation of how problem gaming impacts the daily lives of gamers is lacking. Therefore, the aim of this study is to gain a more complex understanding of the activities in the daily lives of problem video gamers, particularly, what is important to them, what motivates gaming, and what supports/constraints to engagement they experience in other life activities.

### 3.2.1 Utilizing the social ecological model

Understanding the lives of problem gamers is a complicated undertaking that requires the guidance of a holistic conceptual framework. The social ecological model provides such a framework because it considers the relationships among individual, interpersonal, organizational, community, and policy as areas that influence health and well-being (Bronfenbrenner, 1977). An adapted view of the social ecological model by McLeroy et al. (1988) explains that playing video games can be viewed as being influenced by intrapersonal factors (individual characteristics), interpersonal processes (social networks and family), institutional factors (formal and informal organizations), community factors (relationships among the previous levels and the a larger environmental area in which an individual along with their social networks and organizations reside), and public policy (local, provincial, and national laws and policies). This model assumes that human behaviours, environmental conditions, and well-being are inter-related (Stokols, 1996). The social ecological model applied to problem gaming, proposes that the forces underlying the problem are not solely based in the individual gamer but also on the interrelationships between the gamer and his/her surroundings.

Conceptualizing problem gaming and recovery as a transactional process between the individual and the sociocultural context is an important distinction from the traditional medical model that focuses on a illness/disorder. Sociocultural factors are the top determinants of health and well-being that need to be considered when studying of problem gaming (Frank & Mustard, 1994; Good, 1994; Public Health Agency of Canada, 2012). Examples of the social ecological model applied to alcohol use research demonstrated that drinking levels are correlated with individual characteristics such as demographics and personality as well as community availability of alcohol (Gruenewalk, Remer & LaScala, 2014). Social contexts were also found to be correlated with increased drinking risk, such as being in a bar (Gruenewalk et al., 2014).
Similarly, the social and environmental forces associated with problem video gaming need to be considered in combination with individual ones. Individual, interpersonal, institutional, community, and policy environments are all targets for research and practice (McLeroy et al., 1988). Therefore, findings of studies guided by the social ecological model are often more comprehensive and generalizable or transferable than those employing a unidimensional approach (Bronfenbrenner, 1977). They also have the potential to reveal a more complex picture of problem video gaming. This study takes a social ecological approach toward understanding problem gamers to gain a deeper understanding of their lives and how to support them.

3.3 Method

This study employed a qualitative thematic approach where the themes arose from data about the lived the experiences of problem gamers (Boyatzis, 1998). Ethical approval was obtained at both the mental health hospital where the study was conducted and the university of the authors (Appendix A). Participants were recruited through recruitment posters posted throughout a mental health center serving a large geographical area, and advertisements on a stakeholder listserv, online gaming treatment websites, and gaming-related forums (Appendix B). Snowball sampling was used in which the participants were asked if they would like to refer someone they knew to participate in the study. Interested participants were included if they were people who: played video games, were at least 16 years old, scored five or more out of nine questions on the PVP, did not play mostly gambling games, and did not play games professionally/train with professional gamers. A score of more than five on the PVP indicates the presence of problem gaming (Cronback’s alpha at 0.69) (Tejeiro Salguero & Moran, 2002). Professional gamers were excluded because they make a living from playing games as a form of employment (Appendix C and D details the email contact).

Informed consent was obtained from the participants prior to each interview (Appendix E). Eligible participants were asked to keep a daily activity log, on an hourly basis for one week (Appendix F). Activity logs are a method to examine daily activity patterns and help individuals be more aware of how time is spent (Willard & Schell, 2014, p. 170). They were used to help increase the accuracy of self-reporting and for comparing participants’ perceptions of their time use to what they were actually doing. The logs also helped provide additional insights into their daily lives and stimulate discussion during the interview. Participants were asked to bring or
email their logs to the interviewer for the day of the interview. Semi-structured interviews and probes were used to understand the experiences of problem gamers. The interviews were approximately one hour long, were conducted either in-person, by phone, by Skype video, or by Skype audio only (see Appendix G for interview questions). The interviewer (JS) attempted to bracket prior experience with video games during the interviews by allowing participants to expand on their description of gaming related features and used probing questions to facilitate detailed descriptions from the participants. Interviews and data analysis were conducted concurrently through an iterative process. Interview questions were modified as data were collected to gain a better understanding of gamers’ lives (Merriam & Tisdell, 2015). Data collection through interviews continued until saturation was reached (i.e. no new information arose from the data).

3.3.1 Data analysis and rigour

Audio-recorded interviews were transcribed verbatim by the first author and analyzed thematically using methods suggested by Braun and Clarke (2006). Thematic analysis is particularly useful at investigating new, under-explored areas, or participant perspectives that are yet to be uncovered (Braun & Clarke, 2006). It is also a useful method to gain a rich understanding of people’s experiences. The six steps of thematic analysis proposed by Braun and Clarke are: 1) familiarizing yourself with the data by transcribing, re-reading, and noting initial ideas, 2) generating initial codes, 3) searching for broader level themes by sorting and grouping the codes, 4) reviewing themes by cutting, collapsing, or breaking apart initial themes, 5) defining and naming themes by capturing the essence of what each theme is about, and 6) producing the report with extracts embedded in an analytic narrative. Data analysis was inductive in that themes were created from the codes and categories that emerged from the data. This was a systematic process of organizing and presenting data in ways that allowed the identification of connections, patterns and categories (Bogdan & Biklen, 2003).

Computer-aided qualitative data management software NVivo, Version 11, 2015 by QSR International Pty Ltd. was used. Two authors (BK & JS) individually coded two transcripts to support data analyses and triangulation. JS coded all remaining transcripts. The interviews, together with the logs, are a form of methods triangulation where findings are generated by different data collection methods (Merriam & Tisdell, 2015). Finally, reflexive memos and
analytic notes were taken after interviews and written in margins during the transcribing phase. Reflections and analytic thoughts were also discussed with colleagues throughout the research process.

3.4 Findings

3.4.1 Characteristics of participants

Sixteen participants (11 male; 5 female) aged 16 to 35 years old were interviewed for this study. Their mean score on the PVP was seven (with nine as the maximum). According to their activity logs, the participants played a mean of 30.85 hours of video games per week, ranging from 10 hours to 62.5 hours per week. Three people did not fully complete the activity log and were excluded from the calculations. However, actual gaming hours may have been higher due to: 1) participants who stated during interviews that they were gaming during other activities that they did not log, 2) missing data in logs reportedly may have been time spent gaming and, 3) two participants were travelling during the time of log completion so it was not a typical week in which they would typically play more. Furthermore, time spent on other gaming related activities that did not involve physical game-play from the participants were also not included in the mean hours per week calculation. These activities included: 1) watching others play via live streams, 2) reading strategy guides about games, 3) reading fan-fiction related to games, 4) thinking about games, and 5) fixing/building a computer for gaming. Table 3.1 provides a summary of participant characteristics.
Table 3.1: Participant characteristics

<table>
<thead>
<tr>
<th>Participant Characteristic</th>
<th>n=16</th>
</tr>
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<tbody>
<tr>
<td>Country of participant</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>7</td>
</tr>
<tr>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Peru</td>
<td>1</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>1</td>
</tr>
<tr>
<td>Mode of Interview</td>
<td></td>
</tr>
<tr>
<td>In-person</td>
<td>4</td>
</tr>
<tr>
<td>Skype Video</td>
<td>8</td>
</tr>
<tr>
<td>Skype Audio Only</td>
<td>3</td>
</tr>
<tr>
<td>Phone</td>
<td>1</td>
</tr>
<tr>
<td>Vocation</td>
<td></td>
</tr>
<tr>
<td>School*</td>
<td>7</td>
</tr>
<tr>
<td>Work¥</td>
<td>8</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1</td>
</tr>
</tbody>
</table>

*Full-time or part-time school; some students also worked part-time hours
¥Full-time or part-time work

3.4.2 Thematic Findings

Two main themes emerged from interview data analysis—gaming as meaningful and purposeful and push-pull influences on the amount of gaming, each with sub-themes. The first theme pertains to the meaning, purpose, and roles that playing video games serves in a person’s life. The second theme describes different forces that influence decision-making about engaging in gaming versus other activities in life (Table 3.2). Verbatim quotes from interviews are presented to support the themes. Pseudonyms are used to preserve anonymity of participants. Square brackets ([ ])) indicate words inserted by authors to promote clarity of meaning. Three dots (…) signify several missing words.

3.4.2.1 Theme 1: Gaming as meaningful & purposeful

Participants revealed that playing video games is a meaningful and purposeful activity, and that it holds a place in several facets of participants’ lives. For example, friendships are formed around games, it is something they enjoy, some want to work in the video games industry in the
future, and they spend time thinking about games. This section will discuss the subthemes relating to gaming as a meaningful and purposeful activity: gaming as a part of life, the gaming community as a sub-culture, and the roles gaming fulfills in a gamers’ lives.

3.4.2.1.1 Gaming as part of life

*I’m always going to love video games...they’re so big a part of my life that I’m a completely different person because of them.*

Adam’s quote was his response to being asked about whether he feels like he needs to cut down on gaming. Interestingly, all participants reported having grown up with video games as children where a family member encouraged them to play or they watched a family member play. Having grown up with video games, participants felt that gaming is part of who they are and a part of their lives.

Gamers reported that they integrated gaming into their lifestyles. Gaming offers a way to fill idle time but also provides them with a sense of “doing” and engages them with their network of friends. Gaming is usually a go-to activity when they are bored, or have nothing else planned. Several participants reported gaming as being their default activity during idle times such as after coming home from work/school, on weekends, or during breaks, as illustrated by Micah’s quote:

*Video games were always a first option that popped up. It’s just like, "oh well you don’t have anything else to do during this time. You better find something to do with this time. Why not play a video game?"

Although participants used games to fill idle time, they also specified that gaming requires less effort or is “easier” than some other activities. Gamers felt that it was easier to game than to participate in other hobbies, study, do chores, or even to think of another activity do. Since most participants played after they returned home from school or work, they reported feeling too tired to engage in anything else other than gaming. They felt that other activities are too much “trouble” (i.e. takes time to set-up or involves special equipment), involve leaving the house, or are perceived to be “difficult”. They revealed that in contrast, they can play video games within
the comfort of their home while still feeling like they are “doing” something because of the endless possibilities that video games offer.

### 3.4.2.1.2 Gaming community as a sub-culture

A sub-culture is defined as, “a cultural group within a larger culture, often having beliefs or interests at variance with those of the larger culture” (Oxford University Press, 2017). Participants spoke about the gaming community as a sub-culture that is sometimes misunderstood by the dominant culture. All participants had a network of friends who shared similar interests in video games and shared experiences either by playing together or attending gaming events/conventions together. They also reported using games as a way of staying in touch with friends who live far away—even in different countries. Mercedes describes travelling with her boyfriend from Canada to visit friends whom they met while playing online games:

> Sometimes on multiplayers, people in the [USA] that I don’t see that often, we can talk on there while we’re playing together... We met them from playing games to begin with and we met them in real life afterwards... they’re cool. It’s fun...you have an excuse to go [to a new place].

Participants reported not only being able to bond with existing friends through games but also make new friends. Melanie revealed that she invited someone she met through online gaming to her wedding where they finally met in person.

Although the gaming community is viewed as accepting and positive by participants, some adult gamers described feeling misunderstood by those who do not play. Roy explained that gaming affects his current relationship because his partner does not feel it is an age-appropriate activity for adults.

> My current relationship is [under] strain already. Gaming kind of puts a strain on it...not everybody is as open-minded to gaming. People look at it as, it’s only for kids. But people don’t understand gaming is not only for children. But people have this mindset that games are only for kids so they become adults, they’re not supposed to do that. Right? And that is like 90% of the world believes this as well.
Some participants perceived that those who do not play video games believe adults should not be gaming, and that this lack of acceptance of gaming as a mainstream hobby leads to their feelings of being segregated from popular culture. Bernard explained in a follow-up email after his interview that gamers can become increasingly closed off from those who do not share an interest in gaming.

> I think that most hobbies can easily be shared with others. Friends need not be professional dancers, musicians, poets, etc. to appreciate one's performances. If they are not sporting crossfit-ready bodies, we can simply run or cycle at a slower pace. In the case of gaming, however, before one can even begin to make sense of a gamer's world, there's a huge barrier of requisite knowledge, from the gameplay itself, to the characters, specific interactions and metagame. And it is a natural consequence that gamers will feel increasingly distant from other groups of people who cannot in any meaningful sense share the same experiences that they so much enjoy.

Participants felt that it is difficult for outsiders to understand gaming as a hobby and they perceive the activity as “wasting time”. Because of this, Melanie reported that she experiences “guilt that I want to play”. However, many participants in this study sought out opportunities in which they were amongst others who enjoy gaming, which perpetuates their gaming habits and the gaming community.

### 3.4.2.1.3 Gaming as a purposeful activity

According to the participants, the purpose of video games in their lives included offering opportunities to relax, exert control, be challenged and achieve goals. They reported that games help them destress and unwind after work. Mark reported games helped him “relax” after returning to the comfort of his home. Participants also reported that they played because games were enjoyable as well as provided a sense of control. They controlled in-game characters and as Kurt described it, make “multiple choices” where, “you feel like your actions really come into play”. Some participants asserted that gaming is an activity that can be done alone or in the company of friends [online or in person]. It was also conveyed that games offered adventure through role-playing and stimulated creativity. One participant confided that games inspired her art work:
Video games make me want to draw more or, like, have ideas to make other stuff because I craft a lot too. If I wanted to make a bag or something, it’s like, ‘oh, this had really good details, maybe I should use this’.

The most dominant role of games reported by participants was the challenge and sense of achievement they provide. Games are not viewed as a passive activity, but rather, one where participants are motivated by challenge and game related self-improvement as Bernard described:

You can improve yourself in a sense of the game... And that feeling of being able to be faster than them and more clever than them, you know, that’s really, really enticing.

Participants discussed feeling a sense of achievement when they win or accomplish something within the game especially in games with skill ratings and rankings for each individual player. The gamers described a “sense of exhilaration” and feeling “validated” through gameplay.

3.4.2.2 Theme 2: Push and pull influences on the amount of gaming

Push and pull influences on the amount of gaming emerged as a pervasive theme. Specifically, various forces influence choices on the amount of gaming. Personal, interpersonal, and environmental influences pull gamers into games or push them away from games (see Figure 3.1). These forces are sometimes within the individual (e.g., they play because they enjoy it) and sometimes external to the individual (e.g., they play because of influence from friends or because there is nothing else available for them to do in their community). The dotted-line around the “Amount of Gaming” in Figure 3.1 connotes the ability for the amount of gaming to expand or contract based on the pushing and pulling of the influences. The three influences—personal, interpersonal and environmental also converge and do not exist in isolation; each of them push/pull on the amount of gaming simultaneously. For example, a person may want to stop gaming because he is tired, however his friends encourage him to play one more. These influences will be further described in the sections below.
Figure 3.1: Influences that regulate the amount of video game play

Note: Arrows indicate that the influences are pushing and pulling at the amount of time spent gaming so that a person would play more or less.

3.4.2.2.1 Personal push-pull influences

Personal influences reported by participants included their sense of responsibility for other tasks and roles, planning/scheduling, and meeting self-care needs. These needs and tasks competed with the perceived meaning and purpose that participants derived from video games. The most salient personal influence that pushed participants away from gaming was the sense of responsibility—usually associated with a productive activity such as work, school or volunteering. When participants believed that they are engaging in other meaningful activities, they would forego games. Evan described his sense of responsibility in activities other than gaming:

_One really strong thing was getting the job and finding out the responsibility of showing up on time and getting that paycheck every 2 weeks. Knowing that I’m going to get money when I go to that job and there’s something to earn from doing it. That’s the main reason why I go to my job every single time I have a shift and not say, “okay, I’m going to call in today so that I can play games”._
In essence, this sense of responsibility comes from being accountable to oneself (e.g. make money to pay the bills/buy things) or to others (e.g. being a caregiver for a family member).

Two participants described how spirituality and prayer helped them gain a sense of “clarity” and “strength” to put other tasks ahead of gaming. Micah discussed attending church during holy week and reflecting on his life:

> The impending mortality, right. Not that it's impending, but aging is there and [it’s] like, “Okay, I’ve got this time here and I do actually want to be able to build a life that’s not in an apartment [gaming].”

Micah’s comments demonstrate his recognition that building a life outside of gaming is more meaningful to him than staying in his apartment playing games.

Gamers’ sense of responsibility must outweigh the meaningfulness of gaming to push them away from gaming. There may be occasions where gaming takes priority. Emily described using volunteering to control how much she games by booking her volunteer hours on weekend mornings. However, she disclosed that because she enjoys the competitive side of video games, she has sometimes prioritized gaming over volunteering. She described one occasion when she signed up for a video game tournament and cancelled her volunteer activity one weekend in preparation for the tournament so that she did not let down her teammates. Marcus also described skipping a class he did not feel was meaningful to attend because all of the class material had already been posted online and instead opting to play video games at home. Participants’ stories revealed that gaming can outweigh participants’ sense of responsibility if they do not feel the other activity is worthwhile.

As noted earlier, participants often played video games during idle, unstructured times. Intentionally planning time by filling their schedules with other activities was expressed by some participants as a way to push themselves away from games. Although scheduling other activities in their day was not guaranteed to stop gaming, participants often reported that it helped them to set boundaries for gaming. Several participants reported setting an alarm to remind them to stop
gaming and move onto the next activity such as going out with friends or studying for school. Cynthia suggested that it would be helpful for game developers to embed customizable scheduling functions within the games to help her manage her daily activities where the game would “cut off to make you stop so you could go do whatever you need to do next”.

Other participants found enjoyment in alternative activities and participated in them rather than gaming. These participants reported going on excursions around their city or travelling to other destinations as stimulating and like an adventure. Although Mark was pulled to play video games because of the relaxation it brought him, he also reported that going to the gym energized him and gave him motivation in life and therefore pushed him away from gaming. Melanie reflected on the choice to engage in other activities, stating that accessibility was important:

*Having it around is probably the biggest thing. So, having it within reach. And so, like, I can’t pick up a piano but with like a ukulele and a book, I always keep them close.*

Participants felt they needed to choose other activities that also offered the sense of challenge and meaning that many video games offer. For example, two participants described starting hobbies that were difficult but provided them with a sense of pride (e.g. making sourdough bread and dancing).

While some basic self-care tasks such as using the toilet were completed as needed, others such as sleeping, eating, and bathing were all negatively affected by gaming. Participants went to sleep later than intended, skipped meals or ate smaller meals, skipped bathing, and/or neglected physical bodily pain (such as neck and shoulder pain) to continue gaming. At other times, participants set alarms to remind themselves to stop gaming and to go to sleep. Some participants reported foregoing games to catch up on sleep another day (usually on weekends). Even though sleep appeared to be sacrificed for gaming, ironically, it was common for participants to also use gaming to fall asleep or fall back to sleep if they woke during the night.

Another personal “pull” influence on the amount of engagement in gaming was the extent in which participants found games to be helpful as a coping method for negative feelings or
negative life events (such as death of a family member or breakup with a partner). It offered an immersive way to “escape reality” and frustrating situations, as stated by Arnold:

It felt great as a coping method…it did kind of fill this space where I felt my failures were kind of tearing at me. I wasn’t doing well and I felt like it was tearing at me. And then playing these games just kind of filled it sort of. Not satisfyingly, but it just made me feel like I’m okay. Like it was just kind of like a false feeling of happiness… It was just like a bad coping method for me.

Participants acknowledged that using games as a coping method only offered temporary relief from their negative emotions and did not address the problems they are facing. Bernard described using games to feel good and avoid frustration as he struggled to understand some complex concepts he was learning in school. However, after gaming, he realized he had “wasted time” and could have spent that time studying and trying to understand those concepts. Two participants reported playing even though they did not enjoy it anymore, but, continued to use games “like a drug” that “made them feel worse” afterward. They realized that games were not a solution to their problems, but rather, mimicked addiction-like symptoms.

3.4.2.2.2 Interpersonal push-pull influences

Interpersonal influences from co-habitants (family members and partners), friends, social apps/websites, co-workers, teammates, and therapy were highlighted by participants as influence on the amount of video gaming. All participants reported starting gaming at an early age (in primary school) when a parent or other family member supported their engagement with video games either by playing with them, purchasing games for them, or rewarding them with games for doing well in school. Participants who talked about gaming cessation also spoke about parents or family members who helped them engage in other activities—either another hobby (e.g. skateboarding) or productive activity (e.g. finding a part-time job). Participants who lived with their parents and other adult participants reflected on parents’ influence on gaming. Those who lacked supervision or engagement from their parents (e.g. time to talk to their parents about their lives) reported being stuck in an intense gaming period for a longer. It was particularly problematic for Ivan; he played games as the only other activity outside of attending school since early childhood and reported his parents would bring him food to eat at his computer so that he
could continue gaming. He lamented that he did not receive encouragement from them to participate in any other activities.

The influence from others who lived in the same household, such as siblings and romantic partners, was different from parents. Participants reported playing with them as a form of bonding but were also pushed away from gaming because of wanting to better themselves in other ways or feeling guilt/shame for playing. Emily described gaming with her boyfriend, and at the same time, trying to stay accountable to each other:

*We’re usually playing the same game. I’m over here with my computer, he’s over there with his computer (Emily motions with her hands). So, we try to hold each other accountable like, “oh you have work in the morning” ... But sometimes it doesn’t work. It’s half trying to help each other, half like enabling each other. Cause then it’s like, “oh that was a bad game, let’s just play one game before we go to bed”.*

As evidenced above, co-habitants can act in different ways to pull gamers to play more games and/or push them away from gaming.

Participants were not socially isolated and were often pulled into playing games when friends asked them to play online. Gaming was frequently used to bond with friends or co-workers. It was also described as a way to stay in touch with out-of-town friends as they played together through voice-chat. Brian described integrating video games into his volunteer activities where he ran a language exchange program:

*When we do the language exchange, we’re gaming either by board games or console games at the café...So, we play board games or video games with instructions and communication in English and Japanese.*

Participants reported that other influences pulling them towards games are when friends back out of in-person plans, they meet new friends online, and when they use games to reveal friends’ personalities in a different way while playing online together. Adam described how his friends’ personalities can be amplified through a game:
We know people that are either really quiet in real life and then in the game, they’re really loud…and almost, like, vulgar. Like, you don’t expect that kind of stuff to happen. Or, like, people that are selfish minded…their selfishness just shows within the game. And people that are really cooperative and kind and generous, you can see that in the game as well. So, it’s just weird things like that you can just pick up on. It’s valuable to me.

Not all participants were part of the gaming community (as described in the section on the sub-culture of gamers). Some participants who played in isolated situations reported that they may have missed out on exercising their real-life social skills. Their drive to interact with real-life people pushed them away from gaming. Some were pushed away from gaming because of obligations to real-life teams or organizations. Other forces that typically pushed participants away from gaming in these cases were negative—or “toxic”—online players.

One participant reported receiving therapy for personal issues but used it as a way of understanding himself to push himself away from gaming. This participant reported that talking with someone helped him understand that he was using gaming as a “easy” and “reliable” way to get the “stimulation” and “attention” that he needed, but was not offered by his family. Even though his therapy was not targeted at video gaming, he consciously tried to decrease his time spent gaming and to engage in other activities.

Finally, websites and digital applications were also found to influence the amount of gaming, depending on it’s function. Apps and websites that acted as pulling influences included fanfiction websites, gaming forums, team-chat apps (e.g. Skype, Discord, Teamspeak, Ventrillo, etc.), Steam (a game-purchasing app with a social component), gaming bookie websites for gambling, and video streaming websites (e.g. Twitch). Participants reported that they would watch gaming-related videos on YouTube.com that would make them want to play later into the night.

In contrast, interpersonal apps and websites that pushed gamers away from gaming involved online support groups, chat/dating apps, and exercise/activity apps with a social component (Habitica and Couch to 5K were mentioned). Ivan reported that reading personal stories of gamers who were trying to quit playing video games on the StopGaming thread on Reddit.com
helped him stop playing games for at least 82 days and focus on other activities.

3.4.2.2.3 Environmental push-pull influences

Environmental forces that influenced the amount of gaming revealed by this study included game features, physical setting, and environmental supports and barriers to access to activities. First, participants noted that games are designed to be attractive, fun, and “addictive”. Participants described games as interesting, visually appealing, and allowing them to experience infinite possibilities through gaming. Sometimes the game design was so enticing that participants reported playing even though they “hate” it. Lianne talked about enjoying the game design even though she felt nervous playing it and did not like the genre:

I get the jitters when I play a game like Overwatch ‘cause...playing with multiple people makes me feel nervous. Everything feels a little awful even though I’m trying to enjoy the game. It’s weird... [Overwatch] is really pretty and the developers did a really good job on it. So even someone like me can enjoy it. What’s really cool is that their audio effects are amazing. Like, you can hear someone coming up behind you. I freaking hate first person shooters.

Different genres of games and game features are designed to pull players in and keep their attention in different ways (e.g. storylines for exploration or shooter games for excitement). Participants described mobile and non-mobile games being modeled after gambling principles. Random loot or better characters can be awarded for gameplay. Furthermore, Ivan described underage gambling occurring through video games and on digital platforms/websites related to video games. A participant believed that the game developers not only try to make games “addictive”, but that some also try to entice gamers to play several games at once by offering in-game rewards for one game by playing another game by the same company. She also reported that players are punished if they leave in the middle of a game (by losing ranking points or being temporarily blocked from playing the game). However, not all game features can cater to all players. Participants reported stopping to play another game or engaging in another activity if the games do not create a just-right-challenge. Participants often stopped playing out of frustration or anger towards the game. They also stopped playing if they became bored with the game.
Second, the physical setting in which the individual is situated can influence the amount of gameplay. Participants reported retreating into their rooms to play when they lived in households where there are frequent arguments or conflicts. Micah described his environment in the following passage:

Well, the house was messy. The house was always pretty consistently messy and my brother and I would both sort of retreat into the computer land. Not just because of how messy the house was and things like that and the lack of structure in the house but also because my sister was going through her teenage years and my parents and her were getting into yelling matches pretty consistently. So [gaming] was pretty much an escape for us.

Evan, who lived in a small town, reported that there was not much to do in his town, so he spent his time gaming. Both Lianne and Roy talked about living in environments that were dangerous. Roy pointed out that he could have potentially become involved in gang activity if he did not stay home to play video games. Others reported pulling influences towards video games were due to the lack of physical space at home to do other activities and when the weather outside was bad, so they preferred to stay in.

In contrast, if participants enjoyed their environment, they tended to play less and engage more with other activities. This frequently occurred when participants were away from home (e.g. on vacation or at school). When away from home, they typically reported that there were other things to do or they preferred to be with their friends. Sometimes being away also meant that they did not have access to their computer where the games were installed and would only occasionally play mobile games. Alternatively, if participants were doing something else that involved their gaming computer (e.g. for homework or entertainment), starting a game was described as a “easy transition” because they were at their computer already.

Lack of access to computers (e.g. broken computer or lack of finances to fix a computer/buy an expensive game) also prevented gaming. One participant reported intentionally blocking her access to games by changing all the passwords during exam time. In such situations, participants reported they would need find something else to do. Similarly, constraints to participation in other activities included a lack of: finances to do the things they were interested in, access to the
physical space required, and knowledge in resources that were available to them in their communities. Some participants simply reported that they did not know what else there was to do other than to play video games. In summary, personal, interpersonal, and environmental forces converge to push and/or pull in ways that regulate the amount of gaming.

Table 3.2: Summary of themes and sub-themes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-themes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaming as meaningful &amp; purposeful</td>
<td>Gaming as a part of life</td>
<td>Gaming has always been a part of their lives and is integrated into their lifestyles.</td>
</tr>
<tr>
<td></td>
<td>Gaming community as a sub-culture</td>
<td>Gamers are part of a network of people who share similar interests and experiences through video games. Outsiders to this sub-culture might misunderstand gamers or have a lack acceptance for playing video games.</td>
</tr>
<tr>
<td></td>
<td>Gaming as a purposeful activity</td>
<td>Playing video games fulfills a purpose in their lives. This could include gaming for: relaxation, opportunities to exert control, enjoyment, creativity, challenge, and achievement. It could also be used as a coping method or stress management.</td>
</tr>
<tr>
<td>Push &amp; Pull influences on the amount of gaming</td>
<td>Personal influences</td>
<td>Influences that are within the control of the individual or are a characteristic of the individual, such as: their sense of responsibility for other tasks and roles, ability to plan/schedule, and meet self-care needs.</td>
</tr>
<tr>
<td></td>
<td>Interpersonal influences.</td>
<td>Influences from those who interact with the individual, such as: co-habitants, friends, social apps/websites, co-workers, teammates, and therapists.</td>
</tr>
<tr>
<td></td>
<td>Environmental influences.</td>
<td>Influences that are typically outside of the control of the individual, such as: design of the games, where they live, and environmental supports/barriers on activity engagement.</td>
</tr>
</tbody>
</table>

3.5 Discussion

This study uncovered important aspects of how video gaming is integrated into the lives of problem gamers by conceptualizing problem gaming from a social ecological perspective. Contributions towards a more complex understanding of the lives of problem gamers was achieved through qualitative analysis of interviews and hourly activity logs. Understanding that problem gamers extract meaning and purpose from playing video games while they are influenced by push/pull characteristics in their lives could help researchers, policy makers, and health care workers move forward with their work. These prominent themes uncovered by this
study contribute to the study of problem video gaming and may also be useful in the study of other behavioural addictions. The findings from this study will be further discussed below.

This study found that problem gamers experience both positive and negative impacts on their lives from gaming. Even though all participants in this study scored as problem gamers on the PVP, playing video games was a meaningful activity that is perceived to add value to their lives. Similarly, another qualitative study, where gamers were recruited from various online venues also found that fun and meaningfulness were derived from gaming (Rogers, Woolley, Sherrick, Bowman, & Oliver, 2017). Many personal motivators for gaming were revealed by the current study. Gamers in this study described being motivated to play for: socialization/friendships, enjoyment, sense of community, challenge, opportunity to exert control, creativity, relaxation, and filling idle time. They were also motivated to game to cope with other life stressors, to appreciate the game design, and if they were too tired/lazy/unable to do anything else. In essence, the gamers have situated themselves as part of a sub-culture.

Although the benefits of gaming and the motivation underlying it are evident in this study, maladaptive use occurred particularly when gamers used it as a coping method to deal with other stressors in life (e.g. procrastination from school work or avoiding dealing with family issues). Participants reported feeling worse when they used gaming in this way and felt they had wasted precious time. Other researchers have also stated that gaming “disorder” is not a disorder itself, but a consequence of using games as a way of coping or meeting other life needs (Kardefelt-Winther, 2014; Starcevic, 2017). In a qualitative study, Snodgrass et al. (2014) found problematic play was a response to life stress where using video games excessively was a diversion that lead to problems. In this study, the culprit was not video gaming itself but a lack of effective and healthy coping strategies. In this case, therapists can be a valuable support for problem gamers. A need for promoting balanced life activities with problem gamers include learning alternative evidence-based coping strategies for their personal issues and education surrounding healthy gaming use to avoid playing excessively as a way of coping with personal stressors.

Another negative effect of gaming found by this study was a tendency for gaming to override the need to fulfill self-care activities. Sleep and proper nutrition are important issues to consider with problem gamers since sleep can affect physical and mental health (Moore, Adler, Williams, &
Participants reported skipping meals or taking quick meals at their computers which impacts psychosocial well-being (Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004). The finding that gamers typically ignore these self-care needs is concerning and requires further attention. The push-pull influences identified by this study helped shed light on the lives of problem gamers and can be targeted to help control gaming use amongst problem gamers, if excessive gaming is an issue, that needs to be addressed first for the physical and mental well-being of the individual.

3.5.1 Application of the push-pull influences

The push-pull influences on the amount of gaming found in this study are supported by other studies and can be practically applied to interventions with problem gamers. For example, a correlational panel study of German adolescents found excessive gaming is often episodic in that it may appear and disappear quickly from one’s life (Rothmund, Klimmt, & Gollwitzer, 2016). Managing the amount of gaming involves leveraging personal, interpersonal, and environmental supports to participate in other meaningful activities outside of gaming. It could also mean that sometimes access to games should be removed or restricted. As participants indicated, blocking access could be self-imposed or negotiated with someone else living with the individual. If access to gaming is withheld, it would be particularly important to reoccupy the individual’s life with other meaningful activities that offer choice and control to prevent boredom and alienation (Townsend & Polatajko, 2013). Productive activities that provide a sense of responsibility, such as paid or volunteer work could be used to fill the large blocks of time that were previously devoted to gaming.

Many participants used gaming to fill idle time. A study on gaming abstinence with young adults conducted online found that boredom and a need for mental stimulation was experienced by gamers who did not play for 84 hours (King, Kapsis, Delfabbro, & Gradisar, 2016). As boredom and idle time often leads to gaming, an activity described as easy and effortless, there is a need for meaningful activities to be integrated into gamers’ lives in a planned and accessible way. Activities selected to fill blocks of idle time should meet the needs of the individual—that is, whether they want challenge, achievement, adventure, and so on. Finally, planning and setting reminders/alarms can not only help combat the existence of idle time, but also help to set boundaries for gaming and remind gamers when to sleep.
Participants in this study were unable to identify policy or regulatory supports that would help them engage in other activities. This suggests a current lack of support from a policy standpoint from gamers’ perspectives. The suggestion from Cynthia to equip games with built-in schedulers could be an avenue of regulatory exploration. Parental guidance was the only type of regulatory support reported by participants. Some participants in this study reported that their parents encouraged them to participate in other activities; others who did not have this encouragement reported that they wished their parents helped regulate their gaming more. Regulations for video game play might serve to help young gamers who do not have parental guidance or supervision. Several Asian societies are experiencing more problems related to video gaming than Western countries. These concerns have prompted Korea to enact a shutdown law which bans children and adolescents from playing online after midnight and Hong Kong prohibits children under the age of 16 or those wearing school uniforms from entering arcades, while China is considering similar action (Birtles, 2017; Williamson, 2011). Aside from censorship for explicit content, there are currently no provincial/state or federal laws on video gaming in Canada or America. The effectiveness in regulating video game play has been scarcely studied; however, Lee, Kim, & Hong (2017) found the shutdown law in Korea had minimal positive effects on regulating gaming, but yielded negative outcomes on gamers. Enacting legislation for limits on video game play might be more effective alongside promoting other activities and opportunities for gamers to discover other leisure activities that they are interested in and learning to control the amount they play in the future.

In the same vein, as participants reported that gaming is a part of their lifestyle and it is also their “default” activity, the importance of introducing new experiences and activities to youth to broaden their awareness of their range of choices is emphasized here. This is not to say that gaming is an undesirable activity, but because it is mostly sedentary, it should be complemented with activities that promote physical exertion. Physical exercise promotes not only physical health, but, also mental well-being (Fox, 1999). Social assistance programs and/or financial incentives should be implemented to support caregivers in enrolling their youth in physical activities. An example of such support is the children’s fitness tax credit that provides a claim up to $500 per child per year for program involving physical activity by the government of Canada (Government of Canada, 2017). Such support and the development of engaging programing for
youth is crucial in promoting overall health and well-being, particularly with low income households.

Finally, another concern with a lack of policy found by this study is regarding the use of gambling features within video games. Many games have incorporated elements of gambling into their designs such as attractive sounds and colours, bonuses, and the illusion of skill (Griffiths, 1999). Furthermore, Griffiths & King (2015) argue that mini-games within video games appear to meet the criteria for gambling. China is intervening in this issue by mandating gaming companies to announce the random drop rates of “loot” within the games (Tassi, 2017). A greater onus should be placed on video game publishers to support their users’ health. Just as there are typically no clocks readily visible in casinos, most games also do not show the time even though the game fills the screen and immerses the player. A simple solution to this would be to mandate game publishers to integrate a built-in clock into their games. This feature might help gamers who reported using planning/scheduling as a way to maintain their schedules and lead a well-balanced lifestyle.

3.5.2 Limitations & Future Directions

A strength of this study was that participants were sampled worldwide. Therefore, a culturally diverse view of the lives of problem gamers was obtained. However, a limitation was that this was only for English speaking participants. A broader participant pool may have revealed different socio-cultural implications. Another limitation is that the PVP was used to screen gamers and they had not been also clinically assessed. Regarding recruitment, none of the participants were referred by clinicians treating problem gaming even though emails were sent through the listserv and treatment websites; results could have differed with more participants who were currently in treatment for problem gaming as they may have been more severe problem gamers. Furthermore, accessing more gamers with the most serious problems who do not attend school nor work is difficult and strategies should be developed to target this population.

The process of understanding problem gamers will be iterative and best done with a combination of qualitative and quantitative methods. As this study found, problem gaming is not solely a function of individual gamers but influenced by interpersonal and environmental forces as well. Quantitative research can be completed as a follow-up to test the generalizability of the findings
from this study in terms of themes, motivations, supports, and constraints found. As participants in this study encountered difficulties tracking their weekly time-use, caution should be taken with survey studies that ask for “time spent gaming”. Questions asked should differentiate between physical time spent gaming and time spent on gaming related activities. As this study has gained valuable insights using qualitative research methods, future studies could engage different qualitative approaches to understanding the phenomenon of problem video gaming. With the growing video game industry and easily accessible games, future studies can look into how new generations are influenced and what their perceptions are on problem video gaming.

3.6 Conclusion

Everyone needs to use time in a meaningful and purposeful way (Wilcock, 1993). To gamers, playing video games is a meaningful activity in their lives and there is a sub-culture of gamers who enjoy it. However, using video games as a form of coping disrupts lives in negative ways and excessive gaming can interfere with basic functions such as sleep and eating. Personal, interpersonal, and environmental influences were found to moderate the extent to which an individual engages in video games over other activities.

This study identified push-pull forces that influence the amount of gaming and these can be used to moderate gaming use amongst problem gamers. Traditional settings for social activity have changed rapidly with technology (Kennedy & Lynch, 2016) and evidence for a sub-culture of gamers has emerged (Grooten & Kowert, 2015). The gaming culture is relatively new and has advanced quickly while society’s perceptions of gaming as pastime for children/adolescence have remained the same. This study revealed the meaningfulness of video games for young adults and adults. With this in mind, conventional leisure activities for children as well as adults should be closely examined and perhaps socio-culturally broadened to accept these virtual activities. Problem gamers understand what activities offer them a sense of meaning and personal growth. However, in cases where gaming is used problematically to a point of harm or impairment, intervention may be needed to address underlying life issues and control video game use. Similarly, if problem gamers wish to decrease the amount of gaming and participate more in other activities, constraints (pull forces) need to be removed to these activities and adequate supports (push forces) need to be obtained to enable their desired participation.
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Chapter 4
Broadening our understanding of video game “addiction”: A synthesis of quantitative and qualitative research

4.1 Abstract

Video game “addiction” or problem video gaming is gaining media and research attention around the world, however, what it entails and how it manifests in people who experience it remains unclear. Problem video gaming is inextricably linked to individual, social, and environmental circumstances. Therefore, a sole focus on the individual and pathology is misleading as it does not provide a holistic characterization of the phenomenon. A more comprehensive approach to conceptualizing problem video gaming is to use elements from a broader social ecological model. This paper synthesizes the findings of two studies that used the social ecological model as a framework for understanding people who experienced problem video gaming. By doing so, it demonstrates that problem gaming behaviors are influenced by issues arising not only in the individual, but also in interpersonal, and environmental circumstances. It facilitates a new discourse based on these broader understandings. This paper further argues that oversight or neglect of interpersonal and/or environmental issues has resulted in a misrepresentation of some gamers as being “addicted”. Consequently, this paper fosters a more nuanced understanding of people who experience problem video gaming and encourages future research to expand our understanding of problem gaming from solely individually-oriented perspectives to those beyond the individual.

Keywords: video games; computer games; social ecology; addictive behavior; gaming disorder; compulsive behavior
4.2 Introduction

As the use of video games increases across the globe, there has been growing attention to video gaming as a form of behavioral addiction. Viewing video gaming as an addiction remains controversial (Aarseth et al., 2016; van Rooij et al., 2018), hence it has also been referred to as a problematic behavior. Largely, research on problem video gaming has been disease-based and focused on the individual (see Király, Nagygyörgy, Griffiths, & Demetrovics, 2014), with a majority of the theories focusing on neurobiological or psychological determinants of problem video gaming behaviors. Although some social/environmental characteristics related to gaming have been studied (Anderson et al., 2010; Cole & Griffiths, 2007; Yee, 2006), they have not been studied extensively in the context of problematic gaming. The field of game studies or ludology that normalizes the act of playing games has also not addressed the issue of problematic video gaming broadly enough. Considering that gaming is a “normal” and common activity for many people around the world, it is important to understand problem video gaming behaviors within its societal context. Since people are rooted in interpersonal and environmental circumstances, these circumstances are important in influencing the existence of problem video gaming behaviors. This paper argues that interpersonal and/or environmental issues have been overlooked in favour of individual issues, with a resulting focus on illness or “addiction”. It discusses two empirical studies that examined problem video gaming within a social ecological framework, thereby providing a more holistic view of problem video gaming and the lives of people who experience this phenomenon.

Illness or disease models in addictions literature include the chronic disease model (associated with the twelve-step model) and the public health model (Ferentzy & Turner, 2013, p. 107-120). The chronic disease model views addiction as being caused by weakness within the person, such as having an addictive personality. Previous conceptualizations of problem video gaming using this type of model that focuses largely on the individual included genetic, neurobiological, psychological, and biopsychosocial approaches. Genetic and neurobiological approaches claim that neurobiological reward mechanisms are involved with gaming urges in a way similar to substance dependence (Dong, Li, Wang, & Potenza, 2017; Ko et al., 2009). For example, Blum et al. (2000) proposed that dopamine receptors are heavily involved with rewards, thus, carriers of the DAD2 receptor A1 allele with compromised receptors may be more susceptible to compulsive behaviors such as gaming. Psychological approaches have also been commonly
employed, suggesting that problem video gaming is an individual psychiatric disorder and should be diagnosed as such (American Psychological Association, 2013; Hollander, 1993; World Health Organization, 2017; Young, 2009). Finally, the biopsychosocial approach proposed six components of addicted behaviors, including video gaming, as follows: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Griffiths, 2005). Although valuable, these approaches do not account for the external circumstances that may have contributed to, caused, or triggered problem video gaming behaviors.

These person-based, “illness approaches” to problem behaviors are biomedically oriented and are insufficient on their own to fully explain problem video gaming. Recovery in these approaches consist of achieving and maintaining complete abstinence from the addictive substance/behavior (Horvath, Misra, Epner, & Cooper, 2016). Thus, abstinence and subsequent recovery are purported to eliminate the illness, but the person is viewed as being vulnerable their entire life and must abstain from the substance/behavior for life (Ferentzy & Turner, 2013, p. 107-120). Many 12-step programs are meant to provide a form of peer support for substance and behavioral addictions and are based on the disease model that views alcoholism or gambling problems as illnesses that “can be arrested through total abstinence... in any form” (Alcoholics Anonymous, 2018; Ferentzy & Turner, 2012). However, in the case of some behavioral addictions such as food addiction, sex addiction, and problem video gaming, abstinence would be unrealistic. Moreover, this type of dichotomous approach can create a divide between the person who experiences the problems and the rest of society (Acker, 1993) and is particularly inappropriate for application to video gaming, which is seen by many as a harmless pastime.

Alternatively, public health models focus on harm reduction and seek to mitigate the negative secondary consequences of problem video gaming while retaining respect for the rights of people to play video games. While these models are more ideal in understanding problem gaming, they still come from an illness-based perspective that views addictions as a range of problems from mild to severe and aims to control/remove the “toxin” (Ferentzy & Turner, 2012; Ferentzy & Turner, 2013, p. 151-160). As an example, the Distribution of Consumption Model that is based on a public health model attempts to reduce alcoholism by focusing on policies to reduce overall alcohol consumption, rather than focusing on the problem users (Ferentzy & Turner, 2013, p.165). As a result, public health models may be biased towards over-pathologizing normal behavior. Similar to the chronic disease model, it does not focus on the non-addicted gamers, and
thus has a poor understanding of normal levels of gaming. These models also do not adequately address the social and environmental factors that contribute to the behaviors. The social and interactional context in which gamers play video games influences outcomes. For example, a study based on a survey of Dutch youth found that gamers who were socially active online had fewer symptoms of problem gaming (Colder Carras et al., 2017). Social and environmental contexts in which individuals function can be best examined holistically using social ecological models. These types of broader frameworks can deepen and add complexity to our understanding of problem video gaming.

Social ecological models are grounded in Bronfenbrenner’s (1977) Ecology of Human Development framework which presents a way of viewing the mutual direct or indirect interactions between humans and their environmental systems. Social ecological models evolved whereby they are not grounded in a singular discipline, but rather, constitute an overarching paradigm spanning several different fields of research (Stokols, 1996). The four system levels comprise of: 1) the microsystem—a persons’ individual characteristics, 2) the mesosystem—settings of direct interaction with others, 3) the exosystem—settings that affect a person’s development, and 4) the macrosystem—cultural values and political systems that influence people. A particular social ecological model frequently used in public health and health promotion explains relationships between individual, interpersonal, organizational, community, and policy systems as influencing health and well-being (Bronfenbrenner, 1977; Golden & Earp, 2012). In other words, it is the relationship between personal, interpersonal, and environmental levels in a person’s life that, together, affect behavior. Viewing people who experience problem video gaming in relation to their interactions with others and within their environments offers a more comprehensive perspective that accounts for the multiple contexts and systems in which they live their daily lives.

Some research has already been conducted on the interpersonal and environmental contexts of problem video gaming. Particularly, studies with adolescents have revealed the importance of the family unit (Kim & Kim, 2015; Wang et al., 2014). Those who did not experience problem video gaming had significantly higher scores in both parental attachment (or psychological security with parents) and perceived parental acceptance in a South Korean study (Kim & Kim, 2015). Similarly, a study in Hong Kong found problem video gaming to be significantly positively associated with perceived family disharmony (Wang et al., 2014). The authors
recommended that the individual’s relationship with parents should be considered in addition to individual game usage patterns (Kim & Kim, 2015). Outside of the family unit, support from teachers was found to protect children against problem video gaming in a 2-year longitudinal study conducted in China (Yu, Li, & Zhang, 2015). Finally, in terms of the school environment, students with low well-being at school and weaker social integration in class were found to be particularly at risk for problem video gaming in a 5-year longitudinal German school-based adolescent study (Rehbein & Baier, 2013). These studies demonstrate the value of examining interpersonal relationships and environments further.

This paper is not intended as a review of the current state of literature, but a synthesis of findings from two empirical studies that reached beyond previous research by using a social ecological framework to guide their exploration of problem video gaming. The synthesis is supplemented by other literature to help expand our understanding of people who experience problem video gaming and to demonstrate that current interpretations using only a person-based approach may be misrepresenting problem video gaming as an “addiction” or illness when interpersonal and environmental circumstances may also be important contributing influences on problematic behaviors. This paper also provides a closer look at the influence of interpersonal relationships and discusses interactions between the different system levels within the social ecological framework. Study 1 was a quantitative analysis of data from a representative survey on health and drug use of 5,258 adolescents in the province of Ontario, Canada (Shi, Kirsh, Renwick, & Turner, 2018a). Study 2 was a qualitative study drawing on data from semi-structured interviews and activity logs with 16 participants who experienced problem video gaming (both adolescents and adults) from five different countries (Shi, Renwick, Turner, & Kirsh, 2018b). The activity logs were completed by participants on an hourly basis for one week and used to complement the semi-structured interviews. In addition to individual characteristics, these two studies considered environments at home, school, work, and within the games. Both studies identified people who experienced problem video gaming using the Problem Videogame Playing Scale (Tejeiro Salguero & Moran, 2002), with a cut-off score of five or more out of nine questions. The three system levels discussed in the following sections of this paper include the personal, interpersonal, and environmental levels.
4.3 Personal Level

The personal level includes individual characteristics, behaviors, and beliefs. Demographics, health status, problem gambling, and personal reasons for playing games amongst people who experience problem video gaming are discussed in this section.

Regarding demographics, it appears that more males currently experience problem video gaming than females. Study 1 found that males were more likely to experience problem video gaming than females and in Study 2 found that twice as many males were eligible to participate in the interview than females (Shi et al., 2018a; Shi et al., 2018b). Participants who experienced problem video gaming spent more hours per day on games than those who did not experience problem video gaming (Shi et al., 2018a). On average, participants who experienced problem video gaming spent just over 30 hours per week gaming (Shi et al., 2018b) which is almost the equivalent to hours spent working at a full-time job.

Several aspects of health were explored by the two studies. In terms of self-care, some participants in Study 2 reported neglecting their sleep to play video games, but also used video games to fall asleep (Shi et al., 2018b). Moore, Adler, Williams, & Jackson (2002) attribute negative physical and mental health effects on a lack of sleep. In Study 1, participants with lower self-reported mental health were more likely to experience problem video gaming. In Study 2, individuals described playing video games as a “like a drug” experience such that they continued to play, but they no longer enjoyed doing so (Shi et al., 2018b). As suggested by other research as well as by participants in Study 2, it is likely that gaming was, in these cases, used as a coping mechanism for poor mental health or negative feelings (Loton, Borkoles, Lubman, & Polman, 2016; Shi et al., 2018b; Snodgrass et al., 2014) rather than an addiction.

Other personal characteristics examined in Study 1 included alcohol and drug misuse and problem gambling. While problem video game use was not correlated with misusing substances, it was significantly correlated with experiencing problem gambling (measured using the South Oaks Screen Revised for Adolescents) (Shi et al., 2018a). Participants in Study 2 explained that gambling behavior was a common occurrence within video gaming due to: a) the gambling-like design of video games (random rewards/loot); b) video game tournaments which were treated like sporting events (Schneider, 2015); and c) access to online betting platforms or websites.
where gambling can occur with real money or in-game value items (such as rare “skins”) (Shi et al., 2018b).

In contrast to the negative associations found between people who experience problem video gaming and personal characteristics, some participants in Study 2 found gaming to be meaningful and purposeful and a part of life where playing video games has been in their lives since an early age and is part of who they are (Shi et al., 2018b). One participant, Roy, explained that he felt proud to be a gamer:

*I feel so proud when I tell [people], “hey, I played six hours straight!” …There’s always that person that says, “I stayed up five hours reading a book,” or, “I stayed up for five hours dancing,” or, “singing,” or, “I went partying for like the whole night and I’m still awake”. For a gamer, you know, you feel good. I stayed up SIX hours and I STILL got up and came to work.*

Similarly, another qualitative study with those who did not experience problem video gaming also found that gaming was a “significant part of life” (Bourgonjon, Vandermeersche, De Wever, Soetaert, & Valcke, 2016, pg. 1743). However, a sense of responsibility for doing their paid or voluntary work, along with scheduling/planning daily activities and spiritual beliefs helped participants engage in other important activities aside from gaming (Shi et al., 2018b).

### 4.4 Interpersonal Level

The interpersonal level includes direct points of contact with family and friends. These interpersonal interactions occurred in-person or through electronic media.

Participants in Study 2 spoke about coming from immigrant families and using games as a way of bonding with friends in a new country (Shi et al., 2018b). One participant reported that his parents divorced soon after moving to a new country which fortified his gaming habits:

*I was left to choose [which parent] I want to be with. And because I was young, it was really complicated. So, I kind of wanted to get away—one reason to play gam[es]. But they kind of even encouraged me [to play games] because what happened was, when I went over to my dad’s house, he would kind of try and impress me. And try and make it as a fun environment as he could. So, he would encourage me to game.*
Study 2 also found that family members could exert both supportive and negative influences on the amount of gaming (Shi et al., 2018b). Similarly, gamers who were not living with parents but with partners, perceived their partners to have either a positive or a negative influence on their amount of gaming, depending on whether or not their partner shared their interest in gaming (Shi et al., 2018b). For example, at times of family conflicts, a participant reported retreating to his room with his brother to game to “escape” from the “yelling matches”. Study 1 also found decreased parental monitoring (i.e., parents knowing participants’ whereabouts when away from home) was significantly correlated with more problem gaming (Shi et al., 2018a). However, one participant had a sibling who was not interested in gaming and asked the participant to engage in other activities, such that the participant was more likely to stop gaming to spend time with their sibling (Shi et al., 2018b).

Contrary to the popular belief that gamers who experienced problem video gaming were isolated or loners (see Gavriloff & Lusher, 2015), both studies found that they were typically not socially isolated when playing online (Shi et al., 2018a; Shi et al., 2018b). Friends who asked participants to play together influenced some of them to play more frequently or for longer than intended. However, friends who asked them to participate in other activities aside from gaming also helped pull them away from gaming (Shi et al., 2018b). Other organized activities, such as joining a sports team and volunteering, were also described as influences that helped to facilitate outside social and community participation (Shi et al., 2018b).

Newer forms of interpersonal communication through electronic applications and websites, depending on their function, facilitated either increased or decreased video gaming (Shi et al., 2018b). Participants noted software designed for easier communication and networking between gamers (i.e., Twitch.com and Discord) while others were highlighted as being effective for getting participants to do something else, such as using Tinder for dating and Couch-to-5k for physical activity. In all cases, it was up to the participants who experienced problem video gaming to discover these sources on their own or through friends/family since there are no organized resources for introducing alternatives to gaming.
4.5 Environmental Level

The environmental level comprises the community and society in which an individual and their social networks reside. It also encompasses formal and informal organizations such as schools, workplaces, and virtual environments where an individual is situated.

The region in which individuals lived was a significant predictor of problem gaming in Study 1 (Shi et al., 2018a). Participants in Study 2 reported living in a small town without a lot of other choices of activities, a lack of physical space for other activities, unpleasant local weather, and residing in a dangerous neighborhood where it may be unsafe to leave home to participate in other activities, influenced them to play more video games (Shi et al., 2018b). Other community characteristics, such as a lack of access to games, a lack of finances to purchase gaming-related equipment, and a lack of physical access to games/computers influenced them to play video games less often (Shi et al., 2018b). For example, being away from home while travelling helped those with problem video gaming play less with no urges to play reported.

Within this environmental level, social status was perceived as one’s standing in relation to others who shared the same social context. In the school environment, for those who experienced problem video gaming, gaming was associated with a lower self-reported social status as measured by the MacArthur Scale of Subjective Social Status (Goodman et al., 2001; Shi et al., 2018a). Regarding the work environment, participants reported bonding with co-workers over common interests in video games (Shi et al., 2018b). For example, one participant revealed that becoming closer with co-workers could sometimes enable video game playing through leveraging these relationships formed at work:

*One of my friends is actually my boss. I’ll kind of abuse that. I’ll call in saying my car won’t start...and then I’ll play games—I’ll just stay at home and be online.*

On the other hand, being a part of the community by working outside of the home was something that helped people with problem video gaming stay away from games (Shi et al., 2018a; Shi et al., 2018b). This occurred by virtue of the fact that there was less time for the person to stay at home gaming when they are employed and that they were also doing something else that was meaningful to them (Shi et al., 2018b). According to the participants in the qualitative study, working also provided a sense of responsibility that helped decrease the amount of gaming (Shi et al., 2018b).
Aside from school and work environments, the video gaming community and in-game environments were also influential in shaping gamers’ behaviors. A sense of belonging was cultivated through the sub-culture of gamers within a real-world or online community. They had shared interests and experiences with other gamers within and outside of games and they often felt misunderstood by non-gamers who were in their community (Shi et al., 2018b). Gamers who may or may not experience problem video gaming were also found to be on a “cultural diet of video gaming” in a study using online forums (Bourgonjon et al., 2016, p.1745). Within the virtual environments, an enticing game design that was visually and auditorily interesting along with different game genres, influenced the amount of gaming in which those with problem video gaming engaged (Shi et al., 2018b). The game environment enticed gamers to play longer by offering in-game rewards for one game by playing another game that was made by the same company. Furthermore, participants reported that if they left mid-game, they received game-related punishments (Shi et al., 2018b). One participant played daily, even though she reported that she did not enjoy the genre of the game, because she was attracted to the graphics and sounds of the in-game environment (Shi et al., 2018b).

Health systems such as formal mental health therapy offered in one’s environment were noted as important influences on gaming by three participants in Study 2, however, only one had received formal services (Shi et al., 2018b). This participant reported that he had received services for issues unrelated to problem video gaming, but that it had indirectly supported his participation in other activities outside of gaming, such that he decreased his video game playing (Shi et al., 2018b). The lack of participants who received formal support in Study 2 and the fact that receiving mental health services was not significantly correlated with problem video gaming in Study 1, reflects the disconnect between what is measured as problem video gaming and the utilization of formal health care services. Those who experienced problem video gaming did not receive the formal help they needed, which could be due to a lack of resources or awareness of issues/services or, that they were mislabeled as problem gamers.

4.6 Interactions Between Levels

Evidence presented above demonstrates that people who experience problem video gaming are influenced by personal, interpersonal, and environmental circumstances. These synthesized results based on the social ecological model also demonstrate the value of examining
perspectives outside of individual psychological or biomedical fields. Similar results were found by a systematic review of studies focused on children and adolescents in that “external factors” including family, social, and game-related factors were described to promote or maintain problematic gaming (Paulus, Ohmann, von Gontard, & Popow, 2018). The current study goes even further in advancing an understanding of problematic video gaming by discussing the interactions amongst the personal, interpersonal, and environmental levels (Figure 4.1). The permeable lines in the figure represent the fluidity of some of the embedded concepts as well as the interactions that may occur across the three levels. Examples of these interactions will be discussed in this section.

An example of fluidity of the concepts and interactions between the three levels pertains to the sex of the gamers. While sex may be initially thought of as solely a personal characteristic, it is influenced by environmental characteristics. The gendered nature of some types of games influences rates of gaming between the sexes. Most literature on gaming indicates that males play more than females, however this depends on the type of game played as different games fulfill different roles in a gamers’ lives. First-person shooter games attract almost exclusively male gamers (Nagygyörgy et al., 2013), while studies conducted on Second Life where gamers simulate real-life living within a virtual environment found more female gamers (Guadagno, Muscanell, Okdie, Burk, & Ward, 2011). Sex characteristics related to gaming could change with evolving video game design and sociocultural shifts. For example, games historically designed by a male-dominated technology industry are becoming more accessible (i.e. mobile gaming), accepted in society, and gender inclusive. Therefore, sex alone is insufficient to explain demographic influences on problem video gaming.

Another interaction between personal and environmental levels occurs where the design of the gaming environment or genre of the game match the gamers’ needs. Seventy-nine percent of gamers had a clear preference for genre of games which suggested that different types of games fulfil different psychological needs (Nagygyörgy et al., 2013). Additionally, being part of an organized team either outside of video games (e.g. sports teams) or within games, was recognized as an influence on those with problem video gaming. The individual meaningfulness of the activity determined the activity in which they decided to participate. For example, sometimes the importance of practicing video games with their online team overrode physical hockey practice (Shi et al., 2018b). Similarly, because video games were found to be meaningful
to those who experience problem video gaming, games cannot be simply removed from their lives. Instead, they need alternatives to replace some of the meaningfulness that they experienced through gaming. Therefore, resources and interventions targeted at reducing problem video gaming should focus on increasing participation and engagement in meaningful activities outside of gaming.

Interactions between individual social economic status and environmental characteristics were also described in Study 2. For instance, for one participant, living in a dangerous neighborhood was a reason to stay indoors to play video games, however, that participant also lacked the financial means to move to a better neighborhood and access health care services and therapy, as needed (Shi et al., 2018b). Past studies have also demonstrated this interaction between community and social economic status where living in a dangerous or crime-stricken community is linked with a lack of finances (Peterson, Krivo, & Harris, 2000). Study 1 also identified an environmental situation that was linked with the individual level: those who lived in the East region of Ontario were less likely to experience problem video gaming. Interestingly, this region had immigration rates of 10% compared to 43.2% in another region in Ontario where problem video gaming was more prevalent (Durham Region, 2015, p.4; Shi et al., 2018a). In the previous section, as one participant indicated, video games were used to bond with others in his new environment, but family conflicts also arose which may have stemmed from the transition to a new country. These circumstances may have played a role in influencing problem video gaming. Once again, problem gaming behaviors appear to be the result of, and may be influenced by external challenges. It may be the case that problem video gaming is not an illness that should be used to label individuals but a societal issue that needs to be addressed by targeting the interpersonal and environmental levels.

If conceptualizations and targets for the study of problem video gaming are aimed at interpersonal and environmental levels, the perspective that individuals have a gaming “disorder” may be shifted to the view that external networks could be flawed instead. At the person level, the participants in both studies were measured as experiencing problem video gaming. However, at an external level, participants in both studies were not enrolled in formal mental health care services. These low rates of enrollment in mental health care services appear to be a consistent trend with behavioral addictions. For example, problem gamblers also demonstrate an underutilization of services where only 10 to 15% seek help (Collier, 2013). It may be the case...
that the type of help that is the right fit for people who have been labeled to be problem gamers is not currently being offered. Where it may not be the individual who needs direct intervention, interpersonal and environmental circumstances could be targeted. It may be interventions addressing these external levels that hold the most promise for future studies and interventions rather than relying on individual diagnosis.

Figure 4.1: Holistic understanding of people who experience problem video gaming

4.7 Conclusion

The foregoing discussion in this paper strongly suggests the importance of external circumstances such as interpersonal and environmental levels that influence video gaming behaviors. Current interpretations misrepresent problem video gaming as an illness or “addiction” because they narrowly focus only on individual characteristics and do not consider interpersonal and/or environmental issues. The current state of the literature focuses primarily on the individual level while the synthesized results of two recent studies (Shi et al., 2018a; Shi et al., 2018b) demonstrate that problem video gaming is affected by the interplay between individual and external circumstances. Therefore, future research and interventions should attend to understanding problem video gaming throughout personal, interpersonal, and environmental
levels and to considering the interactions of influences at each level so that everyday behaviors such as problem video gaming are not misrepresented as personal flaws. Future research should target multiple levels concurrently so that interventions could address the root of this phenomenon, rather than treat the symptom that manifests as problem video gaming.
References


Chapter 5
Conclusion

*Video games are bad for you? That’s what they said about rock and roll.* –Shigeru Miyamoto
[Representative Director of Nintendo]

5.1 Introduction

The aim of this dissertation was to gain an enriched understanding of the characteristics and lives of problem video gamers. The sub-questions aimed to explore what supports and barriers problem gamers had for engagement in other life activities from their own perspectives. It also sought to examine the prevalence of problem video gaming, characteristics associated with problem video gaming, and motivators to play video games. Furthermore, the four main limitations in video gaming research as described in the introduction were addressed by this dissertation. A consistent form of *measurement* of problem video gamers was employed throughout the studies using a cut-off score of five or more on the Problem Videogame Playing Scale (PVP) (Tejeiro Salguero & Moran, 2002). By consistently using the PVP, this dissertation captured the same group of problem gamers in both studies and therefore, was able to synthesize findings confidently. The *demographics* of both studies included both males and females as well as a wide age range, from youth to 35 years old. Furthermore, problem gamers who were currently not attending school and one who was unemployed were captured in the qualitative study. This dissertation also accomplished the goal of using a more holistic *framework* to include environmental and socio-cultural perspectives. The social ecological model assisted with broadening our awareness of other characteristics attributed to problem video gaming that draw attention away from pathologizing the individual to understanding outside influences. Finally, the convergence of using quantitative and qualitative methods contributed to a diversity in *methodologies* used to study problem video gaming. Consequently, a deeper understanding of problem video gamers was achieved.
5.2 Summary of key findings

The quantitative study in Chapter 2 titled “Are individual, interpersonal, organizational, and community factors associated with problem video gaming?” found approximately 11.7% of Ontario youth are currently experiencing problem video gaming. This study also uncovered eight significant predictors of problem video gaming: problem gambling (OR=17.01, CI=4.8-60.29), sex (OR=4.81, CI=.87-1.49), self-reported mental health (OR=1.24, CI=1.03-1.48), hours spent gaming (OR=1.82, CI=1.59-2.08), parental monitoring (OR=1.26, CI=1.03-1.56), school subjective social status (OR=.88, CI=.8-.92), geographical region (OR=.5, CI=.31-.82), and working outside of the home (OR=.44, CI=.29-.67). These predictors are in areas of individual, interpersonal, organizational, and community levels of the social ecological model. The significance and implications of these predictors are discussed in a later section.

The qualitative study in Chapter 3 titled “Understanding the lives of problem gamers: The meaning, purpose, and influences of video gaming” also took a social ecological approach to understanding problem video gamers. Participants who experienced problem video gaming found gaming to be a meaningful and purposeful activity. Push and pull influences on the amount of video gaming were also identified in personal, interpersonal, and environmental areas. It was found that all three of these areas act together to influence when and how much a problem gamer plays video games. Taken together, video gaming was not a passive activity, but rather a purposeful activity that provided the gamers with: socialization, enjoyment, a sense of community, challenge, opportunity to exert control, creativity, relaxation, and an alternative to boredom. They were also motivated to game to cope with other life stressors and to appreciate the game design.

An integration of the findings from the two studies above was discussed in Chapter 4 that added depth, value and new insights: “Broadening our understanding of video game ‘addiction’: A synthesis of quantitative and qualitative research”. Examining problem video gaming as an illness or “addiction” may be erroneous since this view is centered on the person/individual. This synthesis paper concluded that the issue of problem video gaming cannot be dealt with by solely looking at the individual; environmental and social characteristics must be taken into consideration. Examining interactions of influences at the individual, interpersonal, and environmental levels provides a more holistic view of this new phenomenon.
5.3 Implications, significance, and future directions

The increasing prevalence of problem video gaming among Ontario youth is concerning. A study conducted with the 2009 cycle of the Ontario Student Drug Use and Health Survey found 9.4% of youth were problem video gamers (Turner, et al., 2012) while the quantitative secondary analysis study in this thesis found a prevalence rate of 11.7%. What is more concerning is the high rates of gambling among problem video gamers (OR=17.01, CI=4.8-60.29). The dangers of youth gambling are obvious and require further attention. As revealed in the qualitative study, gambling is often embedded within games and it is easy for gamers to access gambling platforms that are associated with video games. The increasing amount of problem gamers and gambling problems associated with problem video gaming should be monitored and examined in detail in future studies through cross-sectional and longitudinal studies.

Problem video gaming has predominantly been viewed as an individual issue or illness. However, the importance of external or environmental (i.e. social, cultural, etc.) contributions to problem video gaming have been identified in this thesis. This thesis cautions researchers, health care workers, and policy makers to pause before labelling problem gamers by creating a “disorder”. The quote at the beginning of this Chapter by Shigeru Miyamoto alludes to the moral panic that sometimes occurs with cultural innovations. This idea of delaying the creation of a bona fide mental disorder pending thorough research was also highlighted in van Rooij et al. (2018). This thesis is one of the first to take a holistic view of problem video gamers and can serve to stimulate more thought about and research on the external forces that shape this phenomenon.

The limitations of each study have previously been discussed in Chapter 2 and Chapter 3. Although this thesis could not directly address societal, regulatory, industry, or individual interventions for problem video gaming, these are the next steps for future research. A tailored survey study that targets problem gamers online as well as qualitative focus groups also hold promise for future studies. This thesis also adopted modern technology for the recruitment of problem gamers. Using online platforms or social media to recruit participants is a novel but growing trend in health care research (Zhang, Albrecht, & Scott, 2018). In particular, Twitter is one platform that has been examined (Zhang et al., 2018; Sinnenberg, Buttenheim, Padrez, Mancheno, Ungar, & Merchant, 2017). Although this thesis did not recruit directly from Twitter,
it recruited from other online venues that problem gamers might frequently use, such as gaming-related forums and problem gaming threads on a social discussion website. Using these online methods also have increased chances of a successful snowballing effect of reposts from interested participants sharing the ad with their friends. It also had a higher chance of capturing the most isolated problem gamers—an issue that can not be resolved through school-based or employment-based recruitment strategies since video games are played through an electronic medium. Subsequently, the recruitment methods used in this thesis captured a population who may not have responded to paper-based ads. The differences and advantages/challenges of online recruitment can be further explored to improve the representativeness of problem video gamers in research.

5.4 Concluding remarks

Problem video gaming literature is still in its infancy and we are just starting to understand the phenomenon. Even the definition of “behavioral addiction”, the category where problem video gaming would fall under, is still being formulated (see Open Science Framework at https://osf.io/q2vva/wiki/home/). Nonetheless, this thesis offers new insights into the complexity of problem video gaming by explicating the predictors of problem video gaming, an understanding of people who experience problem video gaming, and the interactions between the individuals who experience this, and their environment through a social ecological model. This research also helps to provide a foundation of future research topics regarding problem gamers. Important contributions to the body of research of problem gaming in this thesis include: 1) exploring the prevalence of problem video gaming in Ontario, Canada; 2) finding the most significant predictors of problem video gaming; 3) uncovering motivations for video gaming from the perspective of problem gamers; 4) proposing arguments for the interaction between the individual and his/her environment to influence problem video gaming; 5) proposing a model demonstrating the influences on the amount of video gaming; and 6) synthesizing social ecological factors that contribute to problem video gaming and arguing for an increased focus on external contexts.

The evidence uncovered by this thesis cannot support the creation of a new mental health disorder in the form of “gaming disorder”. Although the quantitative study found several predictors of problem video gaming, those predictors were not shown to be a result of problem
video gaming. Understanding the perspectives of people who experience problem video gaming revealed valuable insights that pointed to both positive and negative associations with playing video games, however, these insights cannot be generalized to the population. Furthermore, the synthesis of study results concluded that issues external to the individual need to be further examined to achieve a more nuanced understanding of problem video gaming. Future diligent research in problem video gaming by nosology experts may conclude that there is robust scientific evidence for gaming disorder, however, evidence from this thesis currently does not support this.
References


Addendum

After this thesis was completed, on June 18, 2018, the World Health Organization officially recognized Gaming Disorder in the International Classification of Diseases, 11th Revision (https://icd.who.int/browse11/l-m/en#/http%3a%2f%2f.id.who.int%2ficd%2fentity%2f1448597234). This decision was passed after much debate within the scientific and video gaming communities as previously alluded to throughout this thesis (see pages 2, 37, 69, and 89). The recognition of Gaming Disorder comes as a relief to many around the world who are seeking treatment for video gaming related issues. This recognition also marks the beginning of more research to come, so that a full understanding of this new disorder can be achieved. Future research should continue to explore meanings placed on video games seek input from people who experience Gaming Disorder. It is through continued open communication, such as using the Open Science Framework, and diligent research that we can advance this new field of behavioural addictions.
Appendices

Appendix A: Ethical approval

PROTOCOL REFERENCE # 096/2016

November 17, 2016

Dr. Nigel Turner
Independent Scientist
Department of Social and Community
Centre for Addiction and Mental Health

Dear Dr. Turner:


We are writing to advise you that the Centre for Addiction and Mental Health Research Ethics Board (CAMH REB) has granted approval to the above-named research study for a period of one year from the date of this letter¹. IF THE STUDY IS EXPECTED TO CONTINUE BEYOND THE EXPIRY DATE, YOU ARE RESPONSIBLE FOR ENSURING THE STUDY RECEIVES RE-APPROVAL BY SUBMITTING THE CAMH REB “ANNUAL RENEWAL OF ETHICS APPROVAL” FORM ON OR BEFORE October 1, 2017. Should the study be completed prior to the annual renewal date, please submit a “Final Report”. The level of continuing review for this study is Level 2.²

Your revised “consent form” received November 17, 2016 and “advertisement” received November 16, 2016; “participant letter” received November 11, 2016 and “protocol” received October 3, 2016 have been approved. Copies of consent, advertisement and letter are attached. Subjects should receive a copy of their consent form.

During the course of the research, any significant deviations from the approved protocol (that is, any deviation which would lead to an increase in risk or a decrease in benefit to human subjects) and/or any unanticipated developments within the research should be brought to the attention of the Research Ethics Office.

Best wishes for the successful completion of your project,

Susan Pilon, MHSc
Manager, Research Ethics Office, CAMH

SP/ot
Encls

cc: Arpita Dubey

¹ CAMH investigators are reminded that should they leave CAMH, they are required to inform the Research Ethics Board of the status of any on-going research. If a study is to be closed or transferred to another facility, the REB must be informed and any advertisements must be discontinued.

² Level 2: Review of annual reports, changes and amendments to the approved protocol, adverse events, filing of a final report and audit of study files/documentation. Please retain a printed copy of this letter (and documents if applicable) for your records. Kindly quote the above reference number on any correspondence relating to this study.
PROTOCOL REFERENCE # 33858

December 7, 2016

Dr. Bonnie Kirsh
DEPT OF OCCUPATIONAL THERAPY
FACULTY OF MEDICINE

Ms. Jing Shi
DEPT OF OCCUPATIONAL THERAPY
FACULTY OF MEDICINE

Dear Dr. Kirsh and Ms. Jing Shi,

Re: Administrative Approval of your research protocol entitled, “Understanding the lives of addicted video gamers”

We are writing to advise you that the Office of Research Ethics (ORE) has granted administrative approval to the above-named research protocol. The level of approval is based on the following role(s) of the University of Toronto (University), as you have identified with your submission and administered under the terms and conditions of the affiliation agreement between the University and the associated TAHSN hospital:

- Graduate Student research - hospital-based only
- Storage or analysis of De-identified Personal Information (data)

This approval does not substitute for ethics approval, which has been obtained from your hospital Research Ethics Board (REB). Please note that you do not need to submit Annual Renewals, Study Completion Reports or Amendments to the ORE unless the involvement of the University changes so that ethics review is required. Please contact the ORE to determine whether a particular change to the University’s involvement requires ethics review.

Best wishes for the successful completion of your research.

Yours sincerely,

[Signature]

Daniel Gyewu
REB Manager
Appendix B: Recruitment flyer

Do you play a lot of video games?

The Rehabilitation Science Institute at the University of Toronto and the Centre for Addiction and Mental Health (CAMH) in Toronto, Ontario is recruiting men and women for individual interviews for research on understanding video game overuse.

**REQUIREMENTS:**

If you are over the age of 16 and have been playing video games/computer games to a point where it negatively affects other daily activities, you may be eligible to participate in our study. We will speak to you in-person or via Skype about your experiences with video gaming and how it affects your daily activities.

A short questionnaire will be required before the interview take place. If you meet the requirements to proceed with the interview, you will receive a gift card at the end of the interview.

If you have friends or family members who play video games and it negatively affects their daily activities, please feel free to pass this information along to them.

**Exclusion:** Please do not respond if the majority of what you play are gambling games or if you are a professional gamer (paid/sponsored to play video games).

**Contact:** Jing Shi can be reached at [email protected] or via Skype using the same email.

REB REF # “096/2016”
Appendix C: Email screen

Hi PARTICIPANT NAME,

Thank you for your interest in participating in the Videogame Overuse Project. My name is Jing and I am a PhD student who is trying to understand videogame overuse and its impact on gamers’ lives.

If you agree to participate in this project, I will interview you for approximately 1 hour and I will ask you to fill out a time log during the week before our interview. Once the interview is complete, you will receive an honorarium as a thank you.

If you are interested, please respond “yes” or “no” to the 9 questions below and I will contact you to let you know whether you qualify for the interview.

In the last 6 months...
1. When I am not playing video games, I keep thinking about them, i.e. remembering games, planning the next game, etc.

2. I spend an increasing amount of time playing video games.

3. I have tried to control, cut back or stop playing, or I usually play video games over a longer period than I intended.

4. When I lose a game or I have not obtained the desired results, I need to play again to achieve my target.

5. When I can’t use video games I get restless or irritable.

6. When I feel bad, e.g. nervous, sad, or angry, or when I have problems, I use the video games more often.

7. Sometimes I conceal my video game playing to the others, this is, my parents, spouse, friends, teacher, co-workers, etc.

8. In order to play video games I have skipped classes or work, or lied, or stolen, or had an argument or a fight with someone:

9. Because of the video game playing I have reduced my schoolwork or job demands, or I have not eaten, or I have gone to bed late, or I spent less time with my friends and family.

Thank you very much for your time. I look forward to hearing from you.

Sincerely,

Jing

Jing Shi, MSc(OT), OT Reg. (Ont.)
PhD candidate, Rehabilitation Sciences Institute,
University of Toronto
Research Trainee, Institute for Mental Health Policy Research,
Appendix D: Email follow-up

Hi PARTICIPANT,

Thanks for your responses. I really appreciate your help with our study. I'm looking for anyone who scored 5 or more "yeses" in those 9 questions and who is not a pro gamer making money off gaming.

I attached a time log to this email (you can chose whichever format is best for you). Could you please fill in the main activity that you were doing that hour. For example, things you could put down could be: sleeping, resting, gaming, tech time, eating, friends, family, exercise, school/work/volunteer, reading, etc.

Please start filling in the log today for 1 week, we can find a common time to do the interview anytime after 1 week. In terms of logistics, please let me know which country/time zone you are in. If you're in Toronto I can book an interview room at 33 Russell St. If you're not within driving distance then we can speak via Skype.

Please let me know if you have any questions. If you can please give me a few times when you'd be free for the interview, we can go from there. Thanks!

Best,

Jing

Jing Shi, MSc(OT), OT Reg. (Ont.)
PhD candidate, Rehabilitation Sciences Institute,
University of Toronto
Research Trainee, Institute for Mental Health Policy Research,
Centre for Addiction and Mental Health
Appendix E: Informed consent

INFORMATION LETTER
Understanding Videogame Overuse

Principle Investigator: Jing Shi, BHSc, MSc(OT), PhD candidate
Rehabilitation Sciences Institute, University of Toronto
Email: [redacted]

Supervisors:
Dr. Bonnie Kirsh, PhD (University of Toronto)
Dr. Nigel Turner, PhD (Centre for Addiction and Mental Health)
Dr. Rebecca Renwick PhD (University of Toronto)

Dear Participant,

Thank you for considering participation in this study. The following letter describes the reason and nature of your potential role in the study. Please read this carefully and identify and questions you may have prior to signing the attached consent form.

Purpose: Video games are widely available on various devices such as smartphones, laptops, consoles, and computers. An estimated 10% of gamers may be addicted to games. We currently do not have a full appreciation of how gaming addiction impacts the daily lives of gamers. There is also no peer-reviewed literature on video game addiction that has been examined through an occupational therapy lens. Therefore, the aim of this study is to gain a deeper understanding of the lives of people with an addiction to video games, particularly what occupations (or activities) are important to them, and what supports and barriers they experience with relation to participation in other activities.

Participation: Although your participation and encouragement and your contributions are valued, your ongoing participation is completely voluntary. You can decline participation and you may also withdraw from the study or excuse yourself at any point during the research process. You will be asked to complete an activity log to track your time use for one week. Afterwards, there will be an interview either in-person or via Skype up to one hour in length where we will discuss activities that are meaningful to you and the supports and barriers you encounter to participate in these activities. Please note that we will use audio recording during your participation unless you refuse. You will receive a $10 gift card as a thank you for participating.

Risks and Benefits: There are no known risks associated with your participation in this study. However, you will be asked about situations in which you may be vulnerable to video game overuse, which may trigger cravings. If this occurs, please discuss those cravings with a counselor at CAMH (or other addiction treatment center/therapist). The study will not benefit you directly; however, your participation is likely to help us learn more about the lives of people who are addicted to video games.

Confidentiality: All information about this study will remain anonymous and the information you provide will be held in the strictest confidence. Your name will not be stored with the data. No personal information will be stored in the encrypted data file. The information you provide for the study will be kept confidential to the full extent of the law. As part of the Research Services Quality Assurance Program, this study may be monitored and/or audited by a member of the Quality Assurance Team. Your research records and CAMH records may be reviewed during which confidentiality will be maintained as per CAMH policies and extent permitted by law.

Summary of Results: There will be approximately 10-30 participants total in this study worldwide. The knowledge gained from this research are expected to be published so that you and other interested people may learn from the research.

Initials: _____
Conflicts of Interest: We have no known actual, apparent, potential or perceived conflicts of interest in conducting this study.

Would you be willing to allow us to contact you for other research projects related to video gaming? □ No □ Yes If yes, please provide your phone number ____-______

Sincerely,
Jing Shi, MSc, OT Reg. (Ont.)

Initials: _____
CONSENT FORM

Understanding Videogame Overuse

By signing this form, you agree that:
1. The study’s purpose and methods have been explained to you.
2. Your participation in the study will have an audio recording unless you state otherwise.
3. Any queries have been answered to your satisfaction.
4. The possible harms, discomforts and benefits (if any) of this study have been explained to you.
5. You understand that you have the right not to participate and the right to withdraw from this study at any time.
6. You are free now, and in the future, to ask any questions about the study.
7. You have been assured that your records will be kept confidential, except where release of information is required by law. You understand that no information that would identify you will be released or printed without asking you first.
8. You understand that the results of the present study will not be used in your academic and/or professional records.

Your data will be kept until full analyses have been performed and research has been published. All electronic files will be erased and hard copies will be shredded no longer than ten years after the completion of the project. All your data will also be destroyed immediately if you choose to withdraw from this study. Please note that all studies involving human participants at CAMH are subject to careful review.

I hereby consent to participate.

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Thank you for your participation. If you would like more information about the study, contact Jing Shi at [redacted]. If you have any questions about your rights, Dr. Padraig Darby may be reached by telephone at [redacted] at the Centre for Addiction and Mental Health.

As part of continuing review of the research, your study records may be assessed on behalf of the Research Ethics Board. A person from the research ethics team may contact you (if your contact information is available) to ask you questions about the research study and your consent to participate. The person assessing your file or contacting you must maintain your confidentiality to the extent permitted by law.

Initials: _____
Appendix F: Activity log sample

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Appendix G: Semi-structured interview guide

Semi-structured Interview Guide

Prior to the Interview

1. Introductions.
2. Send participant the activity log and PVP Scale and provide instructions on how to fill it out. Set-up date, time, and location to meet with the participant. Remind participant to bring the activity log.
3. Explain the purpose of the interview and explain the consent form.
   a. To understand the lives of people who may have videogame overuse
   b. Particularly through an understanding of activities or occupations that are important to you
   c. We’re also hoping to look into what supports and barriers you experience when trying to participate in these other activities as well as gaming.
4. Ask if the participant has any questions prior to the interview. Sign informed consent.

Interview Questions

- Tell me about how you started gaming?
  o How many years have you been gaming for?
  o Approximately how long do you spend gaming in one session?
  o How often do you play? (Frequency)
  o What is your preferred day and time of play?
- What types of game(s) do you play?
  o how does it make you feel?
- What do you enjoy about gaming?
- Tell me about what makes you want to start playing?
  o Emotion, situation, sights, sounds, smells, tastes (any of the senses)
  o Others influence, certain situations
- Tell me about things that make you want to stop playing or take breaks from playing
  o Emotion, situation, sights, sounds, smells, tastes (any of the senses)
  o Others influence, certain situations
- How would you say that gaming affects your life if it does?
  o Relationships, goals, lifestyle
  o Self-care, productivity, leisure
  o Are there any supports or resources that you use to help you cut down on gaming?
  o Do you feel like there are things preventing you from cutting down on gaming?

Go over PVP scale?
- Are there other activities that you do (with peers, family; in the neighborhood; at school)?
  o What do you enjoy about those things?
- Are there other activities that you need to do but aren’t?
  o If yes, what are these activities? If not, why? What are the barriers to participating in activities other than gaming?
o Can you tell me about things that help you or support you in engaging in these other activities?
  o Tell me about some activities you **want** to do but aren’t?
    ▪ Tell me about the barriers to participating in activities?
    ▪ Can you tell me about things that help you or support you in engaging in these other activities?
• Can you describe to me what your typical day looks like? (The activity log will be used at this point to start conversation surrounding their day to day activities.
  o Ask if keeping track of their time affected what activities they did.
  o If they did not follow through, ask them what the barriers were.
  o What are some challenges or pros and cons of keeping a log in terms of regulating gaming
• Is there anything else you would like to tell me about what we’ve talked about today? Or anything you would like to add?

**Conclusion**

1. Thank the participant and see if they have any questions or feedback.
2. Stop recording.
3. If there is anything that they missed or wanted to tell us anything else, we can be reached via email at [redacted]
4. Which country do you live in so that I can give you an Amazon gift card.
5. Send gift card.