

The relationship between online gaming and wellbeing among post-secondary students

by

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## **Author's Declaration**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## Abstract

As the “fastest growing form of entertainment in the world” (Tran, 2019, p. 76), gaming has become a significant part of our society (Groening & Binnewies, 2019). Considering its widespread popularity as a leisure activity amongst adolescents and adults (Entertainment Software Association of Canada, 2020), it is unsurprising that multiple studies have explored its relationship to the player’s wellbeing. Previous research has found mixed findings regarding gaming’s impact on wellbeing. Several findings have identified gaming as a way to relieve stress, relax (Russoniello et al., 2009; Snodgrass et al., 2011; Wack & Tantleff-Dunn, 2009), positively influence aspects of social wellbeing (Gitter et al., 2013; Kowert & Oldmeadow, 2015; Martončik & Lokša, 2016) and is associated with a variety of improvements in psychological and physiological functions (Ryan et al., 2006). Despite these benefits, numerous other findings have associated gaming with negative outcomes such as interfering with a player’s social functioning, wellbeing, and adjustment (Grüsser et al., 2007; Stockdale & Coyne, 2018; Weinstein, 2010). Given these apparent contradictions in previous literature, further exploration needs to be conducted in understanding the relationship of gaming and wellbeing among post-secondary students. To examine this relationship, additional factors that can impact one’s wellbeing should be considered such as the motives for engaging in their leisure pursuits, one’s feelings of connection and support from others in the community, and the breadth of activities one engages in. The purpose of this study was to explore the relationship between gaming and wellbeing among post-secondary students while taking into account the player’s motivation, social connectedness, and overall leisure repertoire. A secondary data analysis was undertaken using data ( $n = 982$ ) gathered from the Georgian College Student Wellbeing Survey launched in January 2019 conducted by the Canadian Index of Wellbeing (CIW). Multiple factors were considered in exploring the relationship to wellbeing including the students demographic characteristics (age, sex, student status). Students identified the frequency and intensity of their gaming, a measure of their leisure repertoire was calculated, and the degree to which they were socially motivated to participate in their leisure assessed. Three different measures were used to assess social connectedness: (1) number of close friends, (2) feelings of social isolation, and (3) sense of community (i.e., social climate and bonds). Finally, as a measure of their subjective wellbeing, students rated their life satisfaction along an 11-point scale. The findings indicated that neither whether students participated in gaming nor their intensity of gaming were

significant factors in explaining wellbeing. Instead, social factors (feelings of social isolation and perceptions of social climate and bonds) and leisure repertoire were particularly significant factors in explaining their wellbeing. Reducing feelings of social isolation emerged as the most important factor in explaining wellbeing irrespective of how intensely or how often students participate in gaming. Ultimately, social context is the most important factor in explaining variations in wellbeing, above and beyond other factors including gaming participation and intensity.

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## **1.0 Gaming and Wellbeing**

Gaming has become a significant part of our society (Groening & Binnewies, 2019) as the “fastest growing form of entertainment in the world” (Tran, 2019, p. 76). Many researchers have recognized gaming as a popular leisure activity amongst adolescents and adults (Entertainment Software Association of Canada, 2020; Brooks et al., 2016; Perrin, 2018). Considering video game’s popularity as a leisure activity, it is not surprising that there are many studies that have explored the impact gaming has on a player’s wellbeing (Ivory, 2013).

### **1.1 Leisure, Gaming and Wellbeing**

#### ***1.1.1 Benefits of Gaming***

Multiple findings have shown the positive impact leisure participation has on an individual’s wellbeing and level of life satisfaction (Caldwell, 2005; Rodríguez et al., 2008). Subjective wellbeing (SWB) is described as a broad construct including an individual’s cognitive and affective reactions to their life (Diener et al., 1999; Diener, 2000; Diener et al., 2002; Myers & Diener, 1995; Ryan & Deci, 2001). Subjective wellbeing consists of an individual’s emotional responses, satisfaction with their life domains, and overall general life satisfaction (Diener et al., 1999; Diener, 2000). Leisure participation enhances subjective wellbeing by creating meaning in life, providing a sense of autonomy, aiding in developing skills and knowledge, and promoting social interactions (Csikszentmihalyi, 1990; Iwasaki, 2007; Walker & Kono, 2018). The significance of gaming as a leisure activity has created interest in exploring its relationship to a player’s wellbeing (Herodotou et al., 2014). Previous research has found video gaming to promote stress reduction, relaxation (Russoniello et al., 2009; Snodgrass et al., 2011; Wack & Tantleff-Dunn, 2009), and positively influences prosocial behaviour, and aspects of social wellbeing (Gitter et al., 2013; Kowert & Oldmeadow, 2015; Martončík & Lokša, 2016). Many players find gaming as a means to stay connected with friends and relax (Stockdale & Coyne).

#### ***1.1.2 Gaming and Negative Outcomes***

Despite these benefits, studies have found gaming to interfere with social functioning and have negative effects on wellbeing (Stockdale & Coyne, 2018; Weinstein, 2010). Excessive gaming has been associated with the development of physical and cognitive health problems (Boxer et al., 2015; Sanders et al., 2014). In addition, different intentions and consequences for playing online games have been identified between adolescents and adults and across genders

(Griffiths et al., 2004; Yee, 2006a). Given the apparent contradictions in the findings of previous research, more studies need to be conducted on the implications of video gaming on the wellbeing of individuals in post-secondary institutions.

## **1.2 The Social Context of Gaming and Wellbeing**

### ***1.2.1 Social Connectedness***

While discussions persist regarding the social benefits and negative outcomes of gaming, future research may further examine the degree of social connectedness and the social motives of gamers. The role of social relationship variables such as social support and social connectedness in relation to subjective wellbeing has been well established in previous research (Yoon et al., 2008). Research has consistently confirmed that having greater perceived social support is strongly associated with better psychological wellbeing and health outcomes (Fleming et al., 1982; Gurung et al., 1997; Lin et al., 1999; Piquart & Duberstein, 2010; Uchino, 2004). Social support is defined as the perception that one is loved and cared for by others, esteemed and valued, and part of a social network of mutual assistance and obligations (Wills, 1991). Social support can be perceived as originating from a variety of interpersonal relationships, such as friends, family, coworkers, community ties, or significant others (Allen et al., 2002). Enhancing the ability to savour experiences, increasing positive affect and self-efficacy, and appraising events as valuable are ways that social support promotes wellbeing (Feeney & Collins, 2015).

Social connectedness pertains to an individual's sense of closeness and togetherness with their social environment (Lee & Robbins, 1995, 1998). Multiple researchers have established social connectedness as a significant factor in enhancing one's wellbeing (Mauss et al., 2011; Yoon et al., 2012). Individuals with a higher sense of social connectedness can connect with others and participate in social situations with a greater sense of ease (Lee & Robbins, 1998). As opposed to individuals with a lower sense of connectedness who may struggle to form relationships leading to feelings of isolation (Lee & Robbins, 1995). Criteria that have been used to define social isolation includes infrequent social contacts, lack of confidante connections and low engagement in social activities (Cornwell & Waite, 2009; Holt-Lunstad et al., 2015).

Gaming has evolved to become a platform where thousands of individuals can come together and make social connections (Anand, 2007). A core component that may be driving the use of gaming is the social interaction with other players (Choi & Kim, 2004; Jansz & Martens,

2005). Gaming can be socially beneficial as a venue for developing and maintaining new connections (Kowert et al., 2014). Being able to form social connections online may act as a substitute for in-person social relationships (Williams, 2006) as people may reduce time with in-person friends to make more time connecting with individuals online (Smyth, 2007). Individuals' focusing solely on in-game achievements and isolating themselves to play compulsively can create a negative impact on their lives (Weinstein, 2010). Previous research has associated video gaming addiction with various negative social and psychological outcomes (Lemmens et al., 2009).

### **1.3 Leisure Repertoire**

Another factor that may have an impact on social outcomes of gaming is the extent to which the activity is a central part of a player's leisure repertoire (or leisure diversity). Specifically, the more gaming is the primary or sole leisure activity of an individual, influences their social engagement. An individual's leisure repertoire has been found to be a critical factor of leisure engagement (Iso-Ahola, 1980). Iso-Ahola (1980) defined leisure repertoire as "all activities a person considers potentially usable during his daily leisure" (p.141). Therefore, one's leisure repertoire is the number of leisure activities that an individual pursues in their leisure time (Stalker, 2011). These leisure pursuits include activities that are participated in or are perceived to be available (Lee et al., 2020). Having a broader range of leisure activities "indicates more knowledge, skills, and experiences in different activities" (Lee et al., 2020, p. 1729). Those with a greater leisure repertoire have more options during their free time and can find a substitute with more ease if the current leisure activity no longer provides positive experiences and rewards (Iso-Ahola, 1980). A diverse leisure repertoire can prevent leisure boredom (Granzin & Haggard, 2000; Iso-Ahola & Weissinger, 1987) and provide the opportunity to create more diverse social connections (Mutz et al., 2020).

Previous findings have identified that leisure repertoire is positively associated with subjective wellbeing (Kim & Kim, 2009; Lee et al., 2016). However, a limited number of studies have included an individual's leisure repertoire in exploring the relationship between leisure pursuits and wellbeing (Mutz et al., 2020). Different forms of leisure within an individual's leisure repertoire can lead to different outcomes. Is the impact of gaming on one's wellbeing moderated by the size of their leisure repertoire?

## **1.4 Motivation**

The degree to which any leisure pursuit chosen by individuals can have an impact on their wellbeing is influenced by how strongly motivated they are to participate. The more strongly motivated they are to participate in activities that are perceived to have specific benefits, the more likely their experiences are positive, and hence, their wellbeing enhanced. Individuals may be motivated to participate in the same leisure activity for a variety of reasons (Crandall, 1980). It is clear that gaming has tremendous appeal and players are highly motivated to engage with them (Ryan et al., 2006), but it remains unclear to what extent their gaming ultimately contributes to their overall wellbeing.

Multiple player models have been created to understand the motivation of gaming. For example, Yee's (2006a) model of player motivations identifies three primary components of player motivation: achievement, social, and immersion. The social component includes socializing, relationships, and teamwork (Yee, 2006a). Of the three factors, socializing and achievement motives were associated with more play (Williams et al., 2008). "Online games bring people together as they use their cell phones, their computers and their gaming consoles to access not only games, but other people" (Williams et al., 2008, p. 993-994). Gaming is strongly socially motivated and connecting with others has been associated with more time playing (Cole & Griffiths, 2007; Johnson et al., 2016; Williams et al., 2008). Although the benefits to one's wellbeing from online social connections can be suppressed by competitive, achievement driven or excessive gaming (Carras et al., 2017; Longman et al., 2009). As proven by the literature, the motive behind gaming is a key factor in exploring the relationship between gaming and wellbeing (Carras et al., 2017; Lafrenière et al., 2009).

## **1.5 Demographics of Gaming**

Gaming has often been associated with late adolescence and early adulthood so an understanding of the relationship between video games and those factors previously identified are important in order to gain greater insight into this cohort. For many individuals, this period in their life involves a major transition to post-secondary education that often involves moving away from home and an increase in independence and autonomy (Lovell et al., 2015). Consequently, the transition to university can result in a significant social displacement for many students (Briggs et al., 2012). Such a transition can be particularly challenging for international students who are not only coming to a new place, but often a new culture.

Domestic and international students both face academic and social adjustments, but international students have been found to have more difficulty adapting (Andrade, 2006). Transitioning to post-secondary, provides young adults with the opportunity to create new experiences, forge new relationships while enhancing their knowledge (Alsubaie et al., 2019). This new environment influences many of their life domains (Gall et al., 2000; Terenzini et al., 1994). This stage can be considered to be a risk period where students participate in activities that have a negative impact on their health (Lovell et al., 2015).

Researchers state that engaging in leisure activities can be a means of engaging in social interactions (Iwasaki, 2007), and that doing so can help international students establish a social network in their social adjustment to college (Glass et al., 2014). Leisure participation can provide an opportunity to develop friendships and provide social support (Iwasaki, 2007), both of which are critical in ensuring an international student's success in their new environment (Sherry et al., 2010). International students coming from a different culture, language, or customs may be exposed to many new leisure experiences in addition to adjusting to their new environment. The leisure activities international students choose to pursue may have an impact on their adjustment and overall wellbeing. Based on the previous research on games, engaging in gaming may provide a pathway for their transition and contribute to their overall wellbeing.

Additionally, gender plays a significant role in shaping leisure patterns (Kim et al., 2019). Traditionally, video games have been recognized as a male space or an activity for men to participate in (Fox & Tang, 2014; Lucas & Sherry, 2004), and at the beginning of the 2000s, more men played online games than women (Hailey et al., 2011). However, there has been a gradual increase in female and older players (Dale & Green, 2017). Gender difference have been found in the frequency and length of time playing, adoption rates, sociability while playing, gaming preferences, and motives for playing games. There have been contradictory findings regarding whether men (Chen, 2010; Chou & Tsai, 2007; Hailey et al., 2011; Stone, 2019) or women (Williams et al., 2008; Kuo et al., 2012) spend more time gaming. In terms of sociability in gaming, male and female players seek different outcomes from their relationships (Yee, 2006a), suggesting motives differ by gender. The foci of men and women differ as men are more goal-oriented as opposed to women who are more relationship driven (Gefen & Ridings, 2005).

## 1.6 Purpose and Research Questions

The purpose of this research is to explore the relationship between gaming and wellbeing among post-secondary students. This study also seeks to consider how social support and connectedness, motivation, and leisure repertoire can help understand the relationship between video gaming and wellbeing. The following research questions will guide this study:

1. What is the relationship between gaming and wellbeing?
  - a. To what extent is the frequency and duration of gaming related to wellbeing?
2. To what extent does gaming behaviour intersect with social connectedness ultimately affect wellbeing?
  - a. Does gaming contribute to the number and quality of social connections?
  - b. Does the intensity of gaming have an influence on the quantity and/or quality of their social connections?
  - c. Does the degree of social support and connectedness experienced by gamers affect their overall wellbeing?
3. Does the relationship between gaming and wellbeing differ for male and female students?
4. Is the relationship between gaming and wellbeing influenced by one's leisure repertoire?
5. To what extent are social motives related to the intensity of gamers' participation?
  - a. To what extent do social motives affect gamers' overall wellbeing?
6. How does social connectedness, leisure repertoire, and social motive collectively contribute to or detract from a gamer's overall wellbeing?
7. Does the intensity of engagement in gaming vary between domestic and international students?

## **2.0 Literature Review**

The core of this study examines the relationship between subjective wellbeing and leisure participation, and gaming in particular. In this chapter, subjective wellbeing and its relationship to leisure is described first, including how different aspects of leisure and an individual's leisure repertoire may contribute to our understanding of the relationship. An individual's social connectedness has been proven to impact their subjective wellbeing. A player's perception on the strength of their relationships may be impacted if they consider gaming a meaningful social activity. How players approach gaming might influence its contribution to their wellbeing. Social connectedness and the motives that drive this student population to participate in gaming could impact leisure's relationship with their wellbeing.

### **2.1 Subjective Wellbeing and Leisure**

Subjective wellbeing (SWB) is defined as a broad construct including people's cognitive and affective reactions to their life (Myers & Diener, 1995; Diener et al., 1999; Ryan & Deci, 2001). Subjective wellbeing includes people's emotional responses, satisfaction with specific life domains, and overall satisfaction with life (Diener et al., 1999; Diener, 2000). It has been regarded as an umbrella term for how individuals think and feel about their own lives (Diener et al., 1999). Researchers are especially interested in determining the key predictors of subjective wellbeing because it is linked to many positive outcomes including better health and social relationships (Diener & Chan, 2011). The link between leisure participation (leisure engagement) and subjective wellbeing has been well examined by numerous studies (Shin & You, 2013; Kuykendall et al., 2015; Schulz et al., 2018).

Scholars from a range of disciplines maintain that leisure is a key to wellbeing (Csikszentmihalyi & LeFevre, 1989; Kelly & Godbey, 1992; Mannell & Kleiber, 1997; Pressman et al., 2009). Leisure is defined as an activity that is freely chosen, provides meaning to the participant, is internally motivated, and is an enjoyable experience outside of obligatory responsibilities (Godbey, 1994). Previous researchers have distinguished several types of leisure activities (Tinsley & Eldredge, 1995; Scott & Willits, 1998; Passmore & French, 2001; Lloyd & Auld, 2002). Though the classification of leisure activities may differ in the literature, it is established that leisure contributes to subjective wellbeing and its relationship is complex (Lloyd & Auld, 2002; Leung & Lee, 2005; Iwasaki, 2007; Rodríguez et al., 2008).

Previous research has shown that leisure participation has a positive impact on an individual's wellbeing, level of life satisfaction and quality of life (Lemon et al., 1972; Caldwell, 2005; Tkach & Lyubomirsky, 2006; Rodríguez et al., 2008; García-Villamizar & Dattilo, 2010; Brajša-Žganec et al., 2011; Newman et al., 2014; Paggi et al., 2016; Ku et al., 2016; Schulz et al., 2018). "The concept of leisure may encompass many types of activities, with varying levels of effect on the participants" (Shin & You, 2013, p. 54), which suggests that the leisure activities an individual seeks to engage in may have a positive, negative, or no impact on their wellbeing.

Lloyd and Auld (2002) supported that there is a positive connection between participating in social activities and subjective wellbeing. Wellbeing has found to have a positive relation with the frequency of participating in leisure activities that the individual enjoys, highlighting the value of various types of leisure activities (Pressman et al., 2009). The relationship between leisure and "wellbeing may depend on the type of activity involved (e.g., physical, sedentary, social)" (Shin & You, 2013, p. 54). Different aspects of wellbeing may have varying levels of affect depending on the types of leisure activities in which people participate (Shin & You, 2013); in other words, certain types of leisure activities may provide additional benefits over other types (Chang et al., 2014). While active leisure activities have been positively related with elevated levels of wellbeing (Holder et al., 2009), passive activities have been negatively correlated with wellbeing (Csikszentmihalyi & Hunter, 2003). Prior findings support the positive relationship between social activities and subjective wellbeing (Lloyd & Auld, 2002). Social relationships can be formed and strengthened through engagement in social leisure activities (Shin & You, 2013). Teenagers facilitate their social development by developing their peer relations in their leisure time (Caldwell & Faulk, 2013).

Although participating in leisure activities has been shown to have a positive association with wellbeing, growing evidence suggest that the relationship may be more complex (Shin & You, 2013). Engaging in too much leisure has been argued to lead to leisure boredom, which has detrimental effects on life satisfaction (Granzin & Haggard, 2000; Iso-Ahola & Weissinger, 1987, 1990). During a study on organizational behaviour Pierce and Aguinis (2013) coined the term "too-much-of-a-good-thing (TMGT)" that illustrates that too much of a good thing can lead to a lack of positive effects. The idea that there is a limit to the benefits one can receive was later confirmed by Schulz et al. (2018) who conducted a study with high school and university students and showed that increased leisure engagement did not continuously enhance the

individual's wellbeing; instead, excessive engagement was found to have a negative effect on their subjective wellbeing. Many studies have identified that excessive leisure participation has a negative impact on the individual's leisure satisfaction and subjective wellbeing (Campbell et al., 1976; Iso-Ahola & Weissinger, 1987, 1990; Granzin & Haggard, 2000; Lee et al., 2020; Ready et al., 2009; Schulz et al., 2018). Lee et al. (2020) "confirmed the existence of leisure satiation and the TMGT effect" (p. 1739).

"While leisure is an ideal context for engaging in activities to promote well-being, people often do not use their leisure to engage in the types of activities that are most conducive to promoting well-being" (Kuykendall et al., 2018, p. 1). Passive activities have found to have a negative connection with wellbeing (Holder et al., 2009). A previous study identified that some leisure activities showed no association with subjective wellbeing (Schulz et al., 2018). Examples of these activities include virtual life, religion and spirituality (Schulz et al., 2018). Overall, by participating in leisure activities an individual can build their social relationships, feel positive emotions, and gain additional knowledge and skills which can improve their quality of life (Brajša-Žganec et al., 2011).

Researchers have presented some theoretical explanations to explain how leisure impacts subjective wellbeing. It has been suggested that participating in leisure activities contributes to subjective wellbeing by creating meaning in life, providing a sense of autonomy, the opportunity to develop skills and knowledge, offers a respite, and promotes social interactions (Csikszentmihalyi, 1990; Iwasaki, 2007; Iwasaki & Smale, 1998; Kleiber et al., 2002; Walker & Kono, 2018). In his review, Diener (1984) distinguished between bottom-up and top-down approaches to subjective wellbeing. The bottom-up model considers that an individual's overall life satisfaction is based on their satisfaction in particular life domains (Kuykendall et al., 2018). These models are often used to explain how leisure experiences indirectly impact wellbeing (Kuykendall et al., 2018). In bottom-up models, leisure participation is an important antecedent of leisure satisfaction which proximally influences subjective wellbeing (Newman et al., 2014; Kuykendall et al., 2015). Top-down factors include relatively stable processes and structures that influence the way the individual perceives and interprets external events (Diener, 1984; Diener et al., 1999). Overall, bottom-up models suggest leisure experience influence subjective wellbeing through leisure satisfaction; in contrast, top-down models propose that those engaging in a variety of leisure activities that meet their psychological needs may perceive their experiences

more positively than individuals with lower subjective wellbeing (Diener, 1984). Kuykendall et al. (2015) investigated the relationship between leisure engagement and subjective wellbeing through a meta-analysis of empirical studies which produced evidence for both bottom-up and top-down models. Regardless of the model being used the relationship between leisure and wellbeing is well established.

The literature provides various explanations of processes underlying the relationship between leisure and subjective wellbeing (Brajša-Žganec et al., 2011). Havighurst's (1961) activity theory which was later refined by Lemon et al., (1972) and Longino and Kart (1982) is one such framework. As stated in activity theory, the greater the frequency of participation and intimacy of the activities are related to higher levels of subjective wellbeing (Lemon et al., 1972; Rodríguez et al., 2008). An alternative theoretical framework is need theory which posits that wellbeing can be increased by satisfying their human needs (Diener & Lucas, 2000). Support has been found for both theoretical explanations on the relationship between leisure and subjective wellbeing (Rodríguez et al., 2008).

Much of the literature on wellbeing has consistently shown that there are variations based on both sex and age. Henderson et al. (2002) identified gender as a critical factor to examine when exploring leisure participation. Gender differences are also evident in many aspects of leisure activity participation (Kort-Butler & Hagewan, 2011; Trainor et al., 2010; Veal, 2005). "Gender is the strongest contributing factor to differences in leisure patterns, even among the educated" (Kim et al., 2019, p. 44). Gender is a consistent predictor of an individual's participation in physical activity (Sallis et al., 2000). Research on adolescents has shown that much of their leisure time is spent engaging in group activities and/or in passive activities (Bradley & Inglis, 2012). In general, men tend to participate in active leisure while women tend to engage in passive leisure (Andrijašević et al., 2005). This trend is also prominent in the university demographic. Male university students tend to participate in sports and other physical activities while female university students pursue passive activities such as listening to music or reading books (Andrijašević et al., 2005; Bouillet et al., 2008; Rahim et al., 2011). Sedentary behaviours have been found to have a negative relationship with the wellbeing of adolescents' (Ussher et al., 2007). Tiggemann (2001) noted that teenagers engage more in social leisure activities than in passive activities, although social leisure has been found to be less beneficial for female students than for male students (Shin & You, 2013). When examining social leisure

with this age group it is important to reflect on the peer group involved and “the fact that social relationships can be developed and strengthened through leisure activities” (Shin & You, 2013, p. 54).

Decades of research has produced numerous validated measurement tools to gather information on the different domains of wellbeing (Adler & Seligman, 2016). Types of measures used in examining wellbeing can be classified into single-item scales and multi-item scales. One such single-item tool is the global measure of life satisfaction which has been used consistently in the literature. Single-item life satisfactions measures are often favoured for “their brevity and ease of administration” (Jovanović, 2016, p. 3173) and included in surveys when researching an individual’s wellbeing (Kahneman & Krueger, 2006).

## **2.2 The emergence of gaming as a significant leisure pursuit**

Gaming has reached a point that it is seen as a significant part of our society (Groening & Binnewies, 2019). “Video game play is the fastest growing form of entertainment in the world” (Tran, 2019, p. 3260). Both adolescents and adults find video gaming a popular leisure activity (Brooks et al., 2016; Perrin, 2018). In 2020, a survey revealed that 23 million Canadians (61% of the population) play video games (Entertainment Software Association of Canada, 2020). These engaging and complex gaming environments or virtual worlds provide a variety of activities and goals for individuals to explore (Ryan et al., 2006). “Many players around the world enjoy the competitive atmosphere, mental challenges, social interaction and fantasy aspects of the games” (Veltri et al., 2014, p. 1). Mobile devices provide players with increased access to their favourite games with 82% of females between the ages of 18-34 playing on mobile devices and 71% of males. (Entertainment Software Association of Canada, 2020). For decades an immense amount of multi-disciplinary research has “explored the role video games have in their user’s lives and in society” (Ivory, 2013, p. 33). Considering video game’s popularity as a leisure activity it is not surprising that there are many studies that have explored the impact they have on one’s wellbeing.

The widespread popularity of digital games as a recreational activity has raised interest in their relationship to the gamer’s wellbeing (Herodotou et al., 2014). In terms of benefits, video gaming has been advocated as a means of stress reduction and relaxation by players (Russoniello et al., 2009; Snodgrass et al., 2011; Wack & Tantleff-Dunn, 2009). Research has provided

increased evidence that gaming is associated with a variety of improvements in psychological and physiological functions, such as enhancing psychological wellness (subjective vitality, self esteem) (Ryan et al., 2006), motor skills, cognitive abilities and hand-eye coordination (Bavelier et al., 2011; Pujol et al., 2016). Previous research conducted on all types of video games has shown that social activity positively influences prosocial behaviour and aspects of social wellbeing (Gitter et al., 2013; Kowert & Oldmeadow, 2015; Martončík & Lokša, 2016). For most, “video games are a harmless way to relive stress, socialize with peers, and spend time” (Stockdale & Coyne, 2018, p. 265).

In contrast, multiple other studies have reported that participating in passive leisure, like playing video games is *inversely* related to wellbeing (Andrijašević et al., 2005; Lajunen et al., 2009). Studies have found that for some individuals, video games can have negative effects on wellbeing and interfere with social functioning and wellbeing (Stockdale & Coyne, 2018; Weinstein, 2010). Previous research has looked at the harmful effects gaming may have on the individual’s self esteem, social development, and social anxiety (Colwell, 1995; Griffiths & Naughton, 2001; Lo et al., 2005; Stockdale & Coyne, 2018). Grüsser et al. (2007) suggested that time spent gaming is negatively correlated with a player’s wellbeing and adjustment. Scholars have raised concerns on the health impacts linked to sedentary behaviour, potential link between violent games and aggressive behaviour and about possible video game addiction (Anderson et al., 2010). Given the research conducted on the complexity of computer games it is evident that this leisure pursuit can provide both psychological harms and benefits to players (Ryan et al., 2006).

Online gaming has been linked to excessive playing and developing game addictions (Grüsser et al., 2007). Gentile et al., (2011) stated that video gaming can become pathological when the player’s attachment becomes dysfunctional damaging multiple levels of functioning such as their academic performance, family life, social functioning, or psychological functioning. “Currently, there is no agreement on the prevalence of gaming addiction due to its conceptualization and methodological problems within the research that has been conducted to date” (Lopez-Fernandez et al., 2019, p. 2). Although, time spent online is a strong predictor of a gaming disorder (Dieris-Hirche et al., 2020). Risk factors to developing pathological video game use (video game addiction) include greater amount of time playing, lower social competence (Gentile et al., 2011), poor impulse control (Gentile et al., 2011; Griffiths et al., 2012), and

limited leisure activities (Rehbein et al., 2010). Excessive playing was found to be more likely among adolescents who overvalued game rewards, had inflexible rules, used gaming as a method of gaining social acceptance, and over relied on gaming to meet self-esteem needs (King & Delfabbro, 2016). Han et al. (2011) showed that extensive gaming is connected with prefrontal brain differences that are similar to other repeated tempting behaviours like substance use (He et al., 2018). Multiple studies have associated problematic gaming with numerous negative psychological and social outcomes. Extensive gaming can be associated with lower school performance, social phobias, attention problems, impulsivity (Gentile et al., 2011), increased depression (Gentile et al., 2011; Brunborg et al., 2014), more conduct problems (Brunborg et al., 2014), anxiety (Caplan et al., 2009; Gentile et al., 2011), lower wellbeing, low self-esteem, shyness, social skills deficits (Caplan et al., 2009), substance use (Turel & Bechara, 2019), increased loneliness and aggression (Caplan et al., 2009; Lemmens et al., 2009), decreased life satisfaction and social competence (Lemmens et al., 2009), and increase in unhealthy foods (Bradbury et al., 2019). Overall individuals with video game addictions report poorer physical, mental and emotional health (Stockdale & Coyne, 2018). In contrast with other studies, Brunborg et al. (2014) noted that these negative social, emotional, and psychological outcomes are specifically related to video game addiction and amount of time spent playing video games alone was not associated with these negative outcomes.

Historically gaming is perceived to be an activity for adolescents and males (Becerra & Stutts, 2008; Chen, 2010). Research findings continue to support that video games belong in the male domain (Fox & Tang, 2014; Lucas & Sherry, 2004) with some exceptions (Kuo et al., 2012; Williams et al., 2008). In the past video game players were typically adolescent or early adult males, however there has been a steady increase in female gamers and older gamers (Dale & Green, 2017). A survey on Canadians between the ages of 13-17 years old found that 60% of females and 90% males considered themselves gamers (Entertainment Software Association of Canada, 2020). This remained fairly consistent with females in the 18-to-34 age group with 58% considering themselves as a gamer, and the males dropping to 82% (Entertainment Software Association of Canada, 2020). As more females choose to participate in online gaming it is necessary to understand their behaviour (Veltri et al., 2014). Over the past decade, a couple empirical studies have specifically explored female gaming (Griffiths & Lewis, 2011; McLean & Griffiths, 2013; Wang et al., 2019). Previous research has found gender differences in frequency

and length of adoption rates, time playing, and gaming preferences. In terms of adoption rates, females begin participating in computer games later in their life in comparison to males (Hainey et al., 2011).

Time spent playing and frequency of play has also been shown to differ between genders. Multiple researchers have stated that more men than women play online games (Becerra et al., 2008; Hainey et al., 2011; Entertainment Software Association of Canada, 2020). Men are more likely to be involved with gaming for a greater number of years, typically play more frequently and for a longer period of time (Chen, 2010; Chou & Tsai, 2007; Hainey et al., 2011; Stone, 2019). Conversely, there are inconsistencies regarding game duration with multiple studies reporting that women spent more time playing (Williams et al., 2008; Kuo et al., 2012). This contrast in research findings may be connected to differences in games being studied (Johnson et al., 2016). The genre of games that men and women engage in differ, studies have found that men play more action and simulation games while females prefer logic and skills training games (Quaiser-Pohl et al., 2006).

An understanding of the relationship between video games and the factors previously identified are important when looking at individuals in late adolescence and early adulthood in order to gain greater insight into the demographic. For many individuals this period in their life involves a major transition of attending post-secondary education. This transition often involves moving away from home and an increase in independence and autonomy (Lovell et al., 2015). This is “a period of change as young people develop new skills, experiences, expand social networks and gain knowledge” (Alsubaie et al., 2019, p. 484). The transition to post-secondary institution represents a transition characterized by change, ambiguity, and adjustment influencing many salient life domains (Gall et al., 2000; Terenzini et al., 1994). The university stage has been found to be a critical risk period as students participate in maladaptive behaviour affecting their health (Lovell et al., 2015). Young adults often engage with online games as a way to relieve stress (Kalkan & Bhat, 2020). Individuals with high levels of stress may engage with online gaming excessively to escape from offline problems (Snodgrass et al., 2014). Excessive gaming in university students can be a risk factor in the development of physical and cognitive health problems (Boxer et al., 2015; Sanders et al., 2014). Understanding and differentiating the motives that drive individuals to engage in gaming can provide a thorough insight on how motives impact their level of participation.

### **2.3 The importance of social connectedness**

The concept of social connectedness refers to an individual's subjective sense of closeness and togetherness with one's social environment (Lee & Robbins, 1995, 1998). An individual's sense of connectedness is intensified through meaningful long-term relationships with others such as family, friends, communities and the greater society (Lee & Robbins, 1998). Previous studies have established that social connectedness is an important factor in enhancing psychological wellbeing (Mauss et al., 2011; Yoon et al., 2012). Maslow's (1943) hierarchy of needs suggest that social interaction and collaboration with others can fulfill one needs and provide a sense of belonging. An individual's sense of connectedness directs their feelings, thoughts and behaviours in social situations (Lee & Robbins, 1998). Therefore, those with a higher sense of connectedness can form relationships and participate in social groups easily (Lee & Robbins, 1998).

In contrast, loneliness, anxiety, and interpersonal problems are linked to a low sense of connectedness (Lee & Robbins, 1995; Lee et al., 2001). Those trying to find a sense of connectedness may struggle to develop relationships that can lead to feelings of isolation (Glover, 2018; Lee & Robbins, 1995). This in turn can lead to other consequences such as distancing one's self from society, the absence of a sense of belongingness and chronic loneliness (Lee & Robbins, 1995, 1998). Infrequent social contacts, absence of confidante connections, and lack of participation in social activities are criteria that have been used to define social isolation (Cornwell & Waite, 2009; Holt-Lunstad et al., 2015). Machielse's (2015) definition takes into account the objectivity of each situation and "the discrepancy between the quality and quantity of existing relationships and a person's desires or standards with regard to relationships" (p.340). Living alone, economic scarcity, and psychological distress can have a negative impact on an individual's ability to form and maintain personal relationships (Biordi & Nicholson, 2013). Social isolation has been associated with multiple negative health outcomes such as increased stress levels, poorer immune system functioning, depression, decreased cognitive functioning and premature mortality (Cacioppo & Patrick, 2008; DiNapoli et al., 2014; Glover, 2018; Nicholson, 2012). "Social isolation represents one of the most pressing social problems of our time, ironically in an age when connecting with others seems so easy" (Glover, 2018, p. 25).

Several studies have explored the relationship between social connectedness and leisure (Arai, 2000; Glover, 2004; Glover & Hemingway, 2005; Warde & Tampubolon, 2002). Putnam (2000) disputed that the type of leisure activity is critical in providing social connectedness. Activities that involve cooperation are better for an individual's social connectedness rather than activities that involve just watching or experiencing (Putnam, 2000). Aside from the type of activity, those involved in the activity can also contribute in the relationship between social connectedness and leisure (Van Ingen & Van Eijck, 2009). Leisure encourages meaningful social connections by drawing individuals together "who share a common identity" (Glover, 2018, p. 28). Research has identified the encouraging relationship between leisure and wellbeing, however it has also been found to contribute to feelings of isolation. "Isolating activities and superficial connections built within leisure, on and offline, reveal leisure to be part of the problem in contributing to social isolation" (Glover, 2018, p. 32). Video games have evolved from simple one or two-person games into massive multiplayer online gaming, which can simultaneously connect thousands of individuals together (Anand, 2007). Now "Video games provide a unique environment in which individuals can play with a very wide range of other people with scarcely any boundary including across age, sex, language or location" (Perry et al., 2018, p. 202). Social interactions with other players may be a core component driving the use of online games (Choi & Kim, 2004; Jansz & Martens, 2005). When interviewed gamers themselves often consider video or online gaming to be a social activity (Cole & Griffiths 2007; Griffiths et al., 2003, 2004; Khanolkar & McLean, 2012; Ream et al., 2013).

Having access to a social venue through online games has "the potential to be socially advantageous for emotionally sensitive individuals by allowing them to overcome their traditional social difficulties, generate new friendships, and strengthen old ones" (Kowert et al., 2014, p. 451). Williams et al. (2006) identified that a third of players engage in online gaming with offline friends that they would not have regular contact with if they were not gaming. Games provide social environments where players are able to develop meaningful friendships and emotional attachments (Chang et al., 2018). With their ability to connect with other individuals via gaming, players are able to form relationships that are comparable to offline relationships (Cole & Griffiths, 2007; Ducheneaut et al., 2006; Longman et al., 2009; Williams et al., 2006; Yee, 2006a). Specific gaming genres have been found to aid in developing social skills and relationships via play (Ducheneaut et al., 2006; Williams et al., 2006). Playing online

provides players with new social relationships as well as the opportunity to play with offline friends and family (Domahidi et al., 2014). “The link between social gaming and positive wellbeing outcomes is reasonably well established” (Perry et al., 2018, p. 203).

In contrast to these positive outcomes that gaming may provide for social connectedness, people may reduce time spent socializing with real-life friends to spend more time making connections with online friends (Smyth, 2007). In the case of some game genres, gaming could cause the player to isolate themselves from the real world or provide an escape from dealing with real world problems (Williams et al., 2008). Users that play compulsively, isolating themselves, and focusing almost entirely on in-game achievements can have a negative impact on an individual’s daily life (Weinstein, 2010). Video game addiction has been associated with a variety of negative psychological and social outcomes including decreased life satisfaction, loneliness, and social competence (Lemmens et al., 2009).

Interacting with other gamers is a major attraction; although men and women vary in the types of interactions they seek (Veltri et al., 2014). Women are more likely to meet people (Guadagno et al., 2011), engage in peer discussions (Hou, 2012), and are more active in group activities (Choi et al., 2012). Male gamers socialize as much as female gamers though they are seeking different things from those relationships (Yee, 2006a). Emerging adulthood is a period of time for self-exploration and development of personal networks through leisure activities (Arnett, 2007). Social connectedness is especially critical for college students as it can impact their ability to adjust to their new environment and norms during this critical developmental time period (Waller et al., 2011). Gamers developed their identity around their leisure pursuits and extend their networking to the gaming community (Khanolkar & McLean, 2012). Gaming’s detracting or contributing role on meaningful social connections can ultimately impact the player’s wellbeing.

## **2.4 The role of motivation**

Individuals engage in leisure activities for a variety of reasons, their wellbeing and the social connections they make may be impacted by the motive that drives their engagement in gaming. For centuries, scholars have attempted to discover why people behave the way they do, especially why people pursue particular leisure activities (Beard & Ragheb, 1983). Iso-Ahola (1999) defined motivation as the influences that initiate, direct, and sustain human behaviour.

Motivations are complex, people can engage in the same leisure activity while having different motivation for doing so (Crandall, 1980). An individual's motivation for engaging in activities can fluctuate at various times in their life (Crandall, 1980). Leisure participants experience intrinsic motivation as the context provides an opportunity to explore interests, pursue meaningful experiences, identity development and skill development (Caldwell, 2005; Larson, 2000). Crandall (1980) stated that leisure motivation can be defined as a need, reason, or satisfaction that promotes participation in a leisure activity. For decades, understanding the motivational factors influencing individuals to participate in leisure activities has been an important field as motivation has been found to influence participation (Crandall, 1980; Frederick & Ryan, 1993; Iso-Ahola, 1989; Kim et al., 2019; Lee & Ewert, 2019; Sivan et al., 2019).

To understand what motivates gamers, research has led to the creation of different player models to understand player motivation. Bartle's (1996) player type model identifies four primary categories of players and describes their motivation and play styles: achievers, explorers, socializers, and killers. Achievers want to act on the virtual world, explorers interact with the virtual world, socializers wish to interact with other players, and killers act on players (Bartle, 1996, 2004). Although Bartle's model was initially based on players of Multi-User Dungeons (MUDs), it has been used to describe players of various other video games (Johnson & Gardner, 2010). Despite its popularity, the underlying assumptions of Bartle's model have never been empirically tested (Johnson & Gardner, 2010). Bartle assumed that the four player types are independent, that the preference for one type of play would suppress the other types (Yee, 2006a). Yee's (2006a) factor analysis revealed that play motivation did not suppress each other as assumed in Bartle's model. "If a player scored high on the achievement component that did not mean they scored low on the social component" (Yee, 2006a, p. 774). This study recognizes that players may be motivated by more than one motive and that their motives could be independent from one another.

Bartle's taxonomy provided a foundational starting point into exploring online gaming motivations (Williams et al., 2008). Building on Bartle's model, Yee (2006a) presented his model of player motivations identifying ten first-order factors summarized within three primary components of player motivation within massively multiplayer online (MMO) games. The components include achievement (advancement, mechanics, competition), social (socializing,

relationship, teamwork), and immersion (discovery, role playing, customization, escape) (Yee, 2006a). Yee's model "links the subjective importance players place on actions they enact in the game world to differences in player demographics and the amount of time individuals spend playing" (Przybylski et al., 2010, p. 163).

A variety of motivation models have been formed using Yee's model as a basis, while some newer models have used other psychological theories. For example, self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000) has been applied to multiple studies to explain gaming behaviour. Przybylski and colleagues (2010) developed the Player Experience of Need Satisfaction (PENS) measure based on self-determination theory and other relevant theories. Though several questionnaires and models have been used to explore this field, Yee's Game Motivation Scale "has been the most popular measure employed in game-related research for nearly a decade" (Chang et al., 2018, p. 45). Frameworks that incorporate motivations for play among players provide the foundation to explore whether motivation varies by subgroup, influences gaming usage or in-game behaviours, or serve as moderators (Williams et al., 2008). Overall, examining motives is a critical component of understanding the relationships between online games and its gamers (Demetrovics et al., 2011).

Demetrovics et al. (2011) assert that our behaviour is mainly determined and influenced by our motives. Understanding motives underlying gaming may highlight differences in player experience, wellbeing and behaviour (Brühlmann et al., 2020). Gaming is generally considered an enjoyable and intrinsically motivating leisure activity (Ryan et al., 2006; Przybylski et al., 2010). A variety of motives can encourage people to play video games including challenge and competition, relaxation, social interaction, stress relief, enjoyment, and mentally escaping from the real world (Sherry et al., 2006). Those that engage in gaming are motivated by multiple motives (Demetrovics et al., 2011; Hilgard et al., 2013; Lafrenière et al., 2012; Yee, 2006a). Furthermore, a gamer's motivation influences their in-game behaviour (Yee et al., 2012; Canossa et al., 2013; Schaekermann et al., 2017; Melhart et al., 2019) in addition to their wellbeing (Przybylski et al., 2010; Vella et al., 2013; Perry et al., 2018).

Evidently, the motivation behind an individual's game play is an important factor in the effects of gaming on wellbeing (Carras et al., 2017; Lafrenière et al., 2009). "The implications of gaming for players' psychosocial and physical well-being have been a major pursuit among

scholars, although the foci are usually on game use rather than motives” (Yang & Liu, 2017, p.53). Previous literature has suggested that specific motives such as social interaction motives and achievement motives may improve the player’s psychological wellbeing (Kawachi & Berkman, 2001; Moak & Agrawal, 2009; Ryan et al., 2006; Seligman, 2008; Thoits, 2011). Recent studies have suggested that due to gaming being largely a social activity it can strengthen connections among friends and thus bring psychological benefits (Herodotou et al., 2014; Lenhart et al., 2015). Longman et al., (2009) found that players that receive social support from other gamers were associated with improved wellbeing. Overall, it is well documented that having a supportive social network is associated with positive psychological wellbeing (Kawachi & Berkman 2001; Longman et al., 2009; Moak & Agrawal, 2009; Thoits, 2011). Improving one’s self-esteem and self-confidence through a sense of accomplishment may positively affect psychological wellbeing (Kaplan & Maehrb, 1999; Seligman, 2008). The benefits to one’s wellbeing from social activity produced by the video game can be mitigated if it is overshadowed by a more competitive, achievement focused or excessive playing (Carras et al., 2017; Longman et al., 2009).

Multiple studies have highlighted that escapism and immersive gaming motives are associated with both negative and social outcomes (Caplan et al., 2009; Kirby et al., 2014; Stetina et al., 2011). A study on massively multiplayer online role-playing games (MMORPGS) found that high immersion motivations and having a preference for virtual life was associated with negative outcomes (Caplan et al., 2009; Liu & Peng, 2009). Griffiths (2010) determined that adult gamers who used gaming as a way to escape from real-life problems had more negative consequences on their wellbeing compared to those who engage in gaming to socialize. Additionally, having an overwhelming achievement motive has been found to be detrimental to the player’s life satisfaction and anxiety (Sauter et al., 2021).

A more in depth understanding of videogame motives provides an excellent predictor of a player’s usage (Sherry et al., 2006). One study found that “increased play is associated with poorer psychological wellbeing, specifically where there is greater player motivation for immersion and escapism, which points towards a negative association between using games to escape from real-life problems and poor mental health” (Goh et al., 2019, p. 749). In one study on players of a massive multiplayer online game (MMO), achievement motives were the strongest predictor of gaming time (Williams et al., 2008). Research has also found that video

game play is often strongly socially motivated and that play with others is associated with greater time spent playing (Cole & Griffiths, 2007; Johnson et al., 2016; Williams et al., 2008).

Many studies have explored gender differences in gaming (Cassell & Jenkins, 1998; Hartmann & Klimmt, 2006; Lucas & Sherry, 2004; Yee, 2006a; Yee, 2006b; Hassouneh & Brengman, 2014; Choi et al., 2012; Zhou et al., 2011; Chou & Tsai, 2007; Wohn et al., 2020). “Both genders enjoy the fantasy aspect of the games and like living through their virtual identities, both men and women seek relationships, diversion from daily lives and excitement” (Veltri et al., 2014, p. 9). From the literature it is evident that men and women show evidence of having similarities and differences in their motives for playing online games (Chou & Tsai, 2007; Lucas & Sherry, 2004; Laconi et al., 2017; Lopez-Fernandez et al., 2019). Research regarding gender differences in gaming motives have offered some conflicting conclusions.

Yee (2006a, 2006b) stated that male gamers have higher achievement motives while females were found to have higher socialization motives for playing online games. Akin to Yee’s study, Hartmann and Klimmt (2006) confirmed that females found video games with competitive elements to be less attractive. Unlike Khan and Muqtadir’s (2016) result which showed that boys had higher achievement, socialization and immersion motives than girls for playing online games. While another study found that both genders were motivated by challenge (Lucas & Sherry, 2004). Regarding sociability while playing, “male players socialize just as much as female players, but are looking for very different things in those relationships” (Yee, 2006a, p. 774). Overall in earlier research, men are typically more goal-oriented, while women are more relationship and socialization focused (Gefen & Ridings, 2005).

Although gender differences have been identified, little research has explored how these differences in motivation vary across genres (Wohn et al., 2020). Recently a survey on players across both social network games (SNG) and massively multi-player online (MMO) games found that women were more motivated by game achievement than men and that there were no gender differences found in social motivation (Wohn et al., 2020). “Most studies on gender differences in gaming were conducted over ten years ago and the patterns found in such research may no longer hold. As the proportion of women gamers has increased over the past decade, play motivations may have changed as well” (Wohn et al., 2020, p. 11). Wohn et al. (2020) imply that female player’s motives have become more achievement oriented and less socially motivated

meanwhile male's motivations have not changed, thus claiming that the gender gap is decreasing. What motivations encourage players to participate in games may vary depending on the age of the gamer. One study found that the need for social interaction was the strongest with the college student age group and that they were motivated to play video games for the challenge, competition and diversion (Greenberg et al., 2010).

Although several studies have examined gaming motives, only a few have compared motivations across multiple genres at the same time (Wohn et al., 2020). Given the significance that different motives lead to different consequences for players (Yee, 2006a) "it is surprising how little attention has been paid to the relationships between gaming motives and player's wellbeing" (Yang & Liu, 2017, p. 53). A player's social motive is of particular interest as the broader scope of my study explores the social context of gaming.

## **2.5 The role of leisure repertoire**

An individual's leisure repertoire (or leisure diversity) is an important component of leisure engagement (Iso-Ahola, 1980). Iso-Ahola (1980) initially defined leisure repertoire as "all activities a person considers potentially usable during his daily leisure" (p.141). Both leisure repertoire and leisure diversity refer to the number of different activities that are pursued in an individual's leisure time (Stalker, 2011). One's leisure repertoire consists of the frequency an individual participates in specific activities and the total number of leisure pursuits the individual engages in (Cheek et al., 1976; Iso-Ahola, 1980). Thus, an individual's leisure repertoire represents the library of leisure activities that a person finds meaningful and engages in (Mobily et al., 1991). Participating in leisure activities from one's leisure repertoire produces "perceptions of competence and psychological comfort", and as a result are engaged in often (Mobily, 1991, p. 211). Leisure repertoire (or leisure diversity) was a topic of interest among scholars when it was initially defined by Iso-Ahola in 1980. Over time, it has become less evident in the literature, with only a few studies taking it into account when examining the relationship between leisure activities and wellbeing (Mutz et al., 2020).

Everyone has leisure activities that make up their unique leisure repertoire that they find meaningful and engage in regularly (Mobily et al., 1991). Individual's leisure repertoires may be broad (participating in many leisure activities) or may be narrow (concentrating on a few activities) (Iso-Ahola, 1986). Possessing a "greater leisure repertoire indicates more knowledge,

skills, and experiences in different activities” (Lee et al., 2020, p. 1729). Additionally, having more diverse leisure activities to engage in can lead to a broader range of positive experiences during their leisure time and opportunities to have more diversified social connections (Mutz et al., 2020). Having a broader repertoire has also been found to be positively associated with psychological wellbeing and negatively associated with depression (Dupuis & Smale, 1995). Former research demonstrated that leisure diversity produced higher life satisfaction (Bevil et al., 1993; Guinn, 1995). As individuals progress through their life, the activities that encompass/ make up their leisure repertoire change due to the individual’s development (Iso-Ahola, 1980; Iso-Ahola et al., 1994). Individuals who participate in numerous activities on a frequent basis during their leisure time can make substitutions more easily when their freedom to engage in an activity is constrained or the original activity is no longer providing positive experiences and rewards (Iso-Ahola, 1980). The interchangeability of recreation experiences by varying the timing of the experience, means of access, the setting, or the activity itself is referred to as recreation substitutability (Brunson & Shelby, 1993). Recreation substitutability enables an individual to replace a leisure activity with another activity that meets similar psychological needs (Mobily et al., 1991). Having the ability to diversify leisure experiences can prevent leisure boredom that has a negative impact on life satisfaction (Granzin & Haggard, 2000; Iso-Ahola & Weissinger, 1987). Thus, individuals that have a greater leisure repertoire rather than exclusively participating in gaming as their main leisure pursuit may demonstrate higher contributions to wellbeing.

Previous studies have examined the diversity in leisure activities and its relationship with subjective wellbeing, consistent with other studies Kim and Kim (2009) and Lee et al. (2016) found that leisure repertoire was positively associated with subjective wellbeing. Conversely, Lee et al. (2018) found that “younger individuals with higher diversity reported lower psychological wellbeing than younger individuals with lower activity diversity” (p.990). A wider range of leisure activities was found to be positively associated with the individual’s perceived health (Payne, 2006).

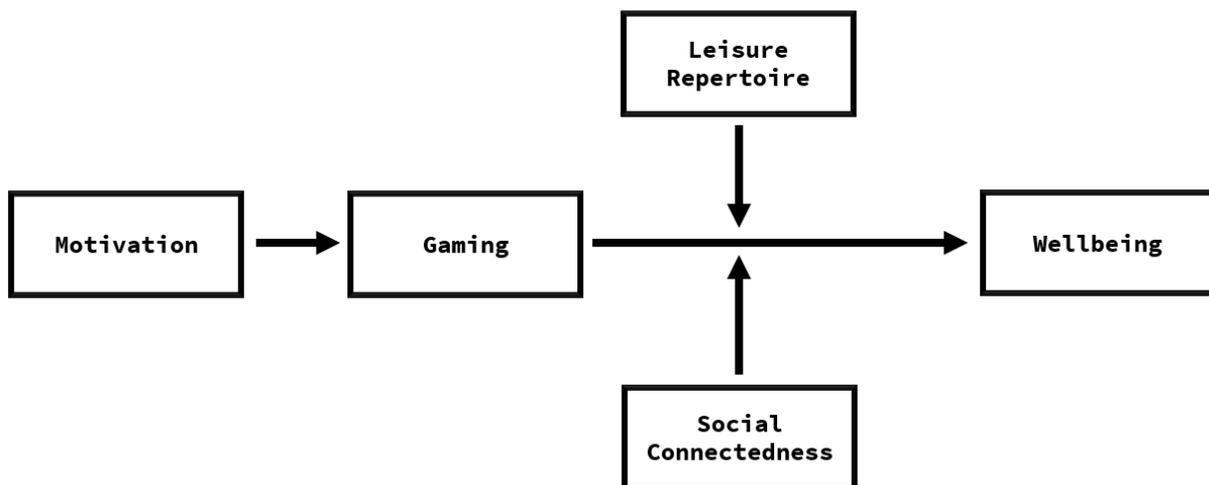
Research on leisure repertoires “largely consists of having individuals list either the total number of activities that they participate in or only those activities participated in within a discrete period” (Stalker, 2011, p. 82). This count indicates the number of different activities that an individual may participate in or find meaningful which is valuable in understanding the total

number of activities that recreationists choose to engage in during their leisure time (Stalker, 2011). The majority of leisure repertoire research has focused on the experiences of older adults' during retirement (Pitas & Hodge, 2016), and there has been a lack of research on the leisure patterns of university students (Kim et al., 2019). Exploring this cohort has long been needed because this stage represents a critical developmental point in the lives of older adolescents when they are establishing life-long patterns of leisure interests and behaviours (Iso-Ahola et al., 1994; Scott & Willits, 1998). In addition, to life-course stages, research has found that “gender is the strongest contributing factor to differences in leisure patterns” (Kim et al., 2019, p. 44). Contrary to expectation, Stalker (2011) found that “gender has no impact on the delivery of leisure experiences” (p.95).

## 2.6 Summary

In summary, based on what we have discovered about the relationship between leisure and wellbeing, and in particular, the role of leisure in making important social connections as a pathway to higher wellbeing, this study sets out to understand how gaming impacts an individual's wellbeing.

Figure 1. Conceptual framework of the relationship between gaming and wellbeing



This figure highlights how the factors previously identified will be examined in the following study. Overall, this study seeks to understand the association gaming has on one's wellbeing. Identifying the motives players have for participating in gaming are expected to have bearing on the nature of gaming (e.g., intensity) and its contribution to gamers' wellbeing. The degree to which gaming ultimately influences gamers' wellbeing is expected to be moderated by their leisure repertoire as well as the degree to which they have established positive social connections. Does the number of leisure activities (or lack thereof) have an impact on the amount of time individuals participate in gaming behaviour and hence their wellbeing? Does the connection gamers feel towards others mitigate any negative effects gaming may have on their wellbeing? With these factors in mind, this study focuses on gaining a better understanding of the role of gaming on the wellbeing of post-secondary students.

## **3.0 Methods**

In this study of the relationship of gaming to the wellbeing of post-secondary students, a secondary data analysis was undertaken using data gathered in a 2019 survey of students registered at large community college in central Ontario. Data were drawn from the Georgian College Student Wellbeing Survey launched in January 2019. The survey explored student's wellbeing through the lens of the Canadian Index of Wellbeing (CIW) framework, which is based on eight domains of life that are most critical to their wellbeing: Community Vitality, Democratic Engagement, Education, Environment, Healthy Populations, Leisure and Culture, Living Standards, and Time Use.

### **3.1 Data Source and Sample**

The Georgian Student Wellbeing Survey was administered in January 2019 and invited 8,067 students registered at one of the three main campuses of Georgian College (Barrie, Orillia, and Own Sound) to participate in the online survey. After approximately five weeks, the survey was closed, and 982 usable questionnaires comprised the final sample (12.2% response rate). A facsimile of the online version of the student wellbeing survey that replicates the wording and sequence of all relevant questions to this study can be found in Appendix A.

Utilizing secondary data provided by a previously conducted survey such as this has the advantage of both cost and time efficiency (Johnston, 2014; Smith et al., 2011). The Georgian College Student Wellbeing Survey encompasses a wealth of information including measures on leisure participation, wellbeing, social connectedness, and gaming, which precludes the necessity of gathering original data. However, the original survey did not focus on gaming specifically as a leisure activity, so the secondary dataset is limited in the extent to which the measures provide details on, for example, the specific type of gaming in which students participated. This limitation represents the main comprise in conducting secondary data analysis (Smith et al., 2011), hence caution must be exercised in subsequent interpretations.

### **3.2 Measures**

#### ***3.2.1 Wellbeing***

Student's overall wellbeing was measured using the OECD single item measure of life satisfaction, which was measured along a 10-point satisfaction scale ranging from "very

dissatisfied” (value = 1) to “very satisfied” (value = 10). This measure of wellbeing served as the dependent variable in the study.

### **3.3 Key Constructs**

#### ***3.3.1 Computer Related Activities***

Students were asked to indicate the total number of separate times on a typical day they played computer games (including online, console, and handheld). In addition, they were asked to indicate how much time on a typical day they engaged in any form of computer and/or electronic device-related activities for leisure. The number of times per day playing computer games reflects their *frequency* of participation, and the total amount of time they spent using devices for leisure allows for an estimate of that time devoted to computer games to be calculated and reflect the *intensity* of their gaming. This measure is based on participant behaviour as individuals did not self-identify as “gamers” or “non-gamers”. Based on this behavioural measure, the terms “gamers” and “non-gamers” are used throughout the study to refer to those who indicated whether or not they participated in gaming regardless of whether or not the participants themselves self-identify as such.

#### ***3.3.2 Leisure Repertoire***

Students reported the frequency of their participation in a variety of categories of leisure activities. The categories of leisure in which they could indicate participation included: (1) social leisure (e.g., socializing off campus, going to bars or taverns); (2) physical leisure (e.g., vigorous exercise, light exercise); (3) passive leisure (e.g., reading books or magazines, doing puzzles); (4) cultural leisure (e.g., attending music concerts, visiting galleries and museums); (5) computer-related leisure (e.g., searching the internet for leisure); (6) media-based leisure (e.g., television, online movies). Students were asked about a total of 17 leisure activities and to derive a measure of their leisure repertoire, the sum of all of the activities in which the students indicated any participation was calculated with higher scores indicating a more diverse leisure repertoire.

#### ***3.3.3 Social Connectedness***

Social connectedness was examined through three distinct measures related to social connectedness: (1) number of close friends, which is an objective measure of social isolation (e.g., “How many close friends do you have, that is, people who are not your relatives, but who

you feel at ease with, can talk to about what is on your mind, or call on for help?”); (2) social isolation based on the UCLA 3-item loneliness scale, which is a subjective measure of social isolation (e.g., “I often feel isolated from others”); and (3) sense of community was measured using a 12-item scale assessing three dimensions: (i) *help in case of need*, which refers to the availability and willingness of others to help out; (ii) *social climate and social bonds*, which reflects the quality of the friendships they have, how sociable people are, and how easy it is to connect with others; and (iii) *needs fulfillment*, which is the perceived range and accessibility of community services and opportunities to satisfy needs. The scale is based on Prezza et al.’s (2009) Multidimensional Territorial Sense of Community Scale (MTSOCS), which provides measures on three different aspects of people’s feeling of social support. The UCLA 3-item scale and the 12-item sense of community scale both used 7-point Likert-type agreement scales ranging from “very strongly disagree” (value = 1) to “very strongly agree” (value = 7). Mean scores on each scale are calculated and higher scores on the UCLA scale indicated greater feelings of social isolation and higher scores on the three dimensions of the sense of community scale indicated a greater sense of social support from others and the community.

For the purposes of this study with its focus on social connectedness, only the composite measure for the social climate and bonds dimension is considered in subsequent analyses. The perception of help in case of need or the availability of community supports to help fulfil needs are conceptually less directly associated with the notion of how well the students are connected to and feel supported by others in the community.

### **3.3.4 Motivation**

To measure student’s motivation for participating in their chosen leisure activities, a 12-item scale was used based on Beard and Ragheb’s leisure motivation scale (Beard & Ragheb, 1980). The scale was shortened to captures four principal motives based on three items each: (1) social (e.g., “My leisure is most enjoyable when I can connect with others”); (2) physical (e.g., “I participate in leisure that restores me physically”); (3) education (e.g., “My leisure helps me to learn about myself”); and (4) relaxation (e.g., “My leisure helps relieve stress”). Students indicated the extent to which they agreed or disagreed with each statement along a 7-point Likert-type agreement scale ranging from “very strongly disagree” (value = 1) to “very strongly agree” (value = 7). Means scores were calculated for each motive with higher scores indicating greater agreement that the motive was an important feature of their leisure. Given the focus in

this study on the importance of aspects of social connectedness for students' wellbeing, only the social motive is considered in the analyses. Doing so does not suggest that the other motives are unimportant in students' decision to participate in gaming, but they fell outside the intended scope of this study and focusing just on the social motive also helped to reduce complexity in the analyses.

### **3.4 Control Variables**

Two demographic characteristics of the students were used as control variables: (a) sex at birth, which was coded as male (1) and female (0); and (b) current age in years. In addition, students indicated whether they were a domestic or an international student to answer the research question concerning whether their current status played a role in the relationship between gaming and wellbeing.

### **3.5 Data Analysis**

The data gathered in the Georgian College Student Wellbeing Survey have been cleaned and organized into an SPSS file ready for analysis. The study conducted a series of analyses each addressing the various research questions. Following a summary description of the sample of students, descriptive statistics on each of the key concepts were determined along with comparisons of students based on sex, age, and status (i.e., domestic versus international students). Correlations among the key concepts were generated to assess the simple relationships among them. Finally, a series of hierarchical regression analyses were conducted to determine the degree to which different aspects of social connectedness and leisure repertoire mitigated the relationship between gaming and wellbeing.

## 4.0 Results

### 4.1 Description of the Sample

The sample in this study ( $n = 982$ ) consisting of 71.0% women and 29.0% men. The average age of the students in the sample was 24.67 years old with 41.0% falling in the 20 to 24 years age group. Half of the students (50.3%) were in their first year at Georgian College. With respect to their financial circumstances, one-quarter of the students (24.7%) felt they had barely enough to get by compared to the 14.4% who felt they were quite comfortable or had more than they needed. The majority of the students (79.0%) were single and never married and approximately eight in ten (83.9%) identified as domestic students (see Table 1).

Table 1. Characteristics of the sample

<b>Variable</b>	<b>n</b>	<b>Pct.</b>
<b>Sex</b>		
Males	237	29.0
Females	581	71.0
<b>Age group</b>		
Under 20 years	211	25.9
20 to 24 years	334	41.0
25 to 29 years	117	14.4
30 years and older	153	18.8
<b>Academic Year</b>		
Year 1	411	50.3
Year 2	323	39.5
Year 3	71	8.7
Year 4	12	1.5
<b>Financial Status</b>		
Barely enough to make ends meet	202	24.7
Enough to get by	322	39.4
Little left over after meeting obligations	175	21.4
Comfortable/have more than needed	118	14.4
<b>Marital Status</b>		
Single (never married)	643	79.0
Married/ Common-law	135	16.5
Separated/ Divorced/ Widowed	36	4.4
<b>Student status</b>		
Domestic	681	83.9
International	131	16.1

#### 4.2. Comparison of sample characteristics on key constructs

In this section, characteristics of the sample as a whole were compared on their social isolation, social motive, social connectedness, leisure repertoire, and wellbeing. Independent sample t-tests and one-way ANOVAs were used to compare students on social factors (social isolation, social motive, number of close friends, perceived climate and social bonds) based on their sex, age group, and student status (see Tables 2 to 5). They were also compared on their leisure repertoire and subjective wellbeing using independent sample t-tests and one-way ANOVAs (see Tables 6 and 7). The correlations among the key concepts were then examined for the sample as a whole (see Table 8). After separating between gamer and non-gamers, they were compared based on their sex, age, and student status (see Tables 9 to 11), and then on the key constructs: social aspects, leisure repertoire, and life satisfaction (see Tables 12 to 14).

With respect to social isolation, regardless of sex, age, or whether the student is international or domestic, there are no apparent differences in the degree to which they feel socially isolated (see Table 2). The means scores for all groups are relatively similar. Despite some minor differences, the relatively higher standard deviations indicate that there is a fair amount of variation within each group so those small differences in the means are not significant. Based on these results, no group appears to be at greater risk of social isolation than any other.

Table 2. Sample characteristics by social isolation

Characteristic Attribute	Social Isolation <sup>a</sup>			t / F	p
	n	Mean	Std. Dev.		
<b>Sex</b>					
Males	228	3.43	1.38	.890	.374
Females	558	3.35	1.42		
<b>Age group</b>					
Under 20 years	203	3.41	1.35	.648	.584
20 to 24 years	319	3.34	1.44		
25 to 29 years	112	3.49	1.46		
30 years and older	149	3.26	1.38		
<b>Student status</b>					
Domestic	657	3.37	1.38	-.524	.601
International	123	3.30	1.57		

<sup>a</sup> Based on a 7-point agreement scale where higher scores reflect greater feelings of social isolation.

The social motive for leisure participation was found to be significantly different among age groups ( $F = 7.436, p < .001$ ) with students in the two younger age categories (under 20 years of age and 20 to 24 years of age) reporting the strongest motive ( $M = 4.90$  and  $4.92, SD = .91$  and  $1.11$ , respectively). The social motive was significantly lower for students 25 to 29 years of age (see Table 3). Motivations are complex, and as Crandall (1980) stated some years ago, motives for engaging in activities can vary throughout one's life. Younger students reported the strongest social motive, which is consistent with previous research that indicated adolescents spend much of their free time engaging in social activities (Bradley & Inglis, 2012; Tiggemann, 2001). There is no apparent difference between males and females in the degree to which they are inclined to participate in leisure activities by a social motive.

There is also a significant difference between domestic students ( $M = 4.75, SD = 1.03$ ) and international students ( $M = 5.00, SD = 1.18$ ) with international students showing a somewhat higher social motivation in comparison to their domestic peers. Leisure participation can provide an opportunity to develop friendships and provide social support (Iwasaki, 2007), both of which are outcomes that are critical in contributing to international students' success in their new environment (Sherry et al., 2010).

Table 3. Sample characteristics by social motive

Characteristic Attribute	Social Motive <sup>a</sup>			t / F	p
	n	Mean	Std. Dev.		
<b>Sex</b>					
Males	231	4.87	1.05	1.438	.151
Females	570	4.75	1.06		
<b>Age group</b>					
Under 20 years	205	4.90 <sup>a</sup>	.91	7.436	.001
20 to 24 years	325	4.92 <sup>a</sup>	1.11		
25 to 29 years	116	4.45 <sup>b</sup>	1.13		
30 years and older	152	4.63 <sup>ab</sup>	.98		
<b>Student status</b>					
Domestic	671	4.75	1.03	2.388	.017
International	125	5.00	1.18		

<sup>a</sup> Based on a 7-point agreement scale where higher scores reflect a stronger social motive for leisure. Superscripts indicate groups that are significantly difference based on Scheffé post hoc test.

Regardless of sex, age, or whether the student is international or domestic, there are no significant differences in the number of close friends they report having (see Table 4). Between males and females, males had a slightly higher average number of friends, and international students reported a somewhat higher average number of friends compared to domestic students. These small differences are likely not significant because of the high within-group variation in reported number of friends. Although it is not known how long international students have been living in Canada, it is reasonable to assume they came recently to attend school leaving many of their friends and support system behind. While not significant, the somewhat higher number of friends reported by international students than by domestic students could be tied to their higher social motive. International students might be more proactive in connecting with their cultural community once they arrive in Canada to establish new friendships more quickly as well as to maintain existing ones.

Table 4. Sample characteristics by number of close friends

Characteristic Attribute	Number of Close Friends			t / F	p
	n	Mean	Std. Dev.		
<b>Sex</b>					
Males	236	4.00	3.42	1.032	.302
Females	550	3.75	3.02		
<b>Age group</b>					
Under 20 years	211	3.89	2.43	.375	.771
20 to 24 years	334	3.90	3.04		
25 to 29 years	116	3.66	3.02		
30 years and older	152	3.65	4.16		
<b>Student status</b>					
Domestic	680	3.77	2.85	1.167	.244
International	130	4.12	4.39		

Regardless of sex or age, there are no significant differences among students in their perceptions of social climate and bonds in the community (see Table 5). Males had a slightly higher mean score on perceived social climate and bonds compared with females and students under 20 years of age had a slightly higher mean score among the four age groups, but as noted these differences are not significant. Social climate and bonds within the community were statistically significantly higher among international students ( $M = 5.11$ ,  $SD = 1.10$ ) than among

their domestic peers ( $M = 4.87$ ,  $SD = 1.06$ ) ( $t = 2.335$ ,  $p = .020$ ). Although all students face academic and social adjustments, research has found that international students have more difficulty adapting (Andrade, 2006). Despite this more difficult transition, international students appear to have higher quality of friendships, consider people more sociable, and consider it easier to connect with others than their domestic peers.

Table 5. Sample characteristics by perceived social climate and bonds in community

Characteristic Attribute	Social Climate and Bonds <sup>a</sup>			t / F	p
	n	Mean	Std. Dev.		
<b>Sex</b>					
Males	228	4.94	.97	.617	.537
Females	558	3.35	1.42		
<b>Age group</b>					
Under 20 years	203	5.02	1.01	1.838	.139
20 to 24 years	319	4.91	1.09		
25 to 29 years	112	4.73	1.14		
30 years and older	149	4.86	1.00		
<b>Student status</b>					
Domestic	657	4.87	1.06	2.335	.020
International	123	5.11	1.10		

<sup>a</sup> Based on a 7-point agreement scale where higher scores reflect greater perceived social climate and bonds.

In terms of the students' leisure repertoires, there was a statistically significant difference between males and females with females reporting a much more diverse repertoire of activities (see Table 6). This outcome is consistent with previous findings as Kim et al. (2019) considers gender "the strongest contributing factor to differences in leisure patterns" (p.44). Regardless of age or student status, no significant differences in the breadth of their leisure repertoires were revealed (see Table 6). Notably, there is a high level of variation in the number of activities comprising their leisure repertoires (i.e., reflected in the high standard deviations, which range from 3.14 to 4.25). These variations suggest that for almost two-thirds of students, their repertoires ranged from 4 to 12 different leisure activities. The variation in the numbers of leisure activities comprising students' repertoire was among international students ( $SD = 4.25$ ).

Table 6. Sample characteristics by leisure repertoire

Characteristic Attribute	Leisure Repertoire <sup>a</sup>			t / F	p
	n	Mean	Std. Dev.		
<b>Sex</b>					
Males	237	8.19	3.71	6.094	.014
Females	581	8.58	3.14		
<b>Age group</b>					
Under 20 years	211	8.53	3.32	.885	.448
20 to 24 years	334	8.64	3.40		
25 to 29 years	117	8.37	3.28		
30 years and older	153	8.12	3.19		
<b>Student status</b>					
Domestic	681	8.47	3.10	.498	.619
International	131	8.63	4.25		

<sup>a</sup> Number of activities participated in beyond gaming reflecting the diversity of leisure activities.

There was no significant difference in subjective wellbeing between males and females or between domestic and international students (see Table 7). There was, however, a statistically significant difference among age groups. Students 30 years of age and older reported the highest level of life satisfaction ( $M = 7.25$ ,  $SD = 2.13$ ), which was significantly higher than for students 25 to 29 years of age, but not significantly higher than students under 25 years.

Table 7. Sample characteristics by wellbeing

Characteristic Attribute	Wellbeing <sup>a</sup>			t / F	p
	n	Mean <sup>b</sup>	Std. Dev.		
<b>Sex</b>					
Males	234	6.68	2.44	-.786	.432
Females	578	4.16	1.18		
<b>Age group</b>					
Under 20 years	209	6.81 <sup>ab</sup>	2.43	4.055	.007
20 to 24 years	332	6.77 <sup>ab</sup>	2.38		
25 to 29 years	116	6.23 <sup>a</sup>	2.53		
30 years and older	152	7.25 <sup>b</sup>	2.13		
<b>Student status</b>					
Domestic	678	6.78	2.33	-.142	.887
International	129	6.75	2.70		

<sup>a</sup> Based on a 10-point satisfaction scale where higher scores reflect greater overall life satisfaction. Superscripts indicate groups that are significantly difference based on Scheffé post hoc test.

### 4.3 Relationships among key concepts

The correlations among the key concepts are all highly significant, and almost all are consistent with previous research (see Table 8). The results of this analysis continue to emphasize the important role social relationships have for subjective wellbeing. Each construct related to social connectedness is positively related and is negatively related to social isolation, and higher levels of social isolation are significantly associated with lower levels of wellbeing. Multiple studies have documented the negative outcomes associated with social isolation on people’s wellbeing and the same appears to be true for the students in this sample (Cacioppo & Patrick, 2008; DiNapoli et al., 2014; Glover, 2018; Nicholson, 2012).

Table 8. Relationships among key concepts

Concept Dimension	Key Concepts <sup>a</sup>				
	Social isolation	Social motive	Close friends	Social climate	Leisure repertoire
<b>Social antecedents</b>					
Social isolation					
Social motive	-.282 (<.001)				
<b>Social connectedness</b>					
Number of close friends	-.218 (<.001)	-.229 (<.001)			
Social climate	-.605 (<.001)	.387 (<.001)	.236 (<.001)		
<b>Leisure repertoire</b>	-.121 (<.001)	.275 (<.001)	.123 (<.001)	.148 (<.001)	
<b>Wellbeing</b>	-.436 (<.001)	.330 (<.001)	.211 (<.001)	.389 (<.001)	.183 (<.001)

<sup>a</sup> In each cell, correlation shown above with probability below in parentheses.

As reported in previous research (Kim & Kim, 2009; Lee et al., 2016), leisure repertoire is positively associated with subjective wellbeing and negatively related to social isolation (see Table 8). An unexpected finding was the negative relationship between social motive and number of close friends. Initially, a higher social motive was expected to be associated with a higher number of friends. However, this result suggests students with a higher social motive and lower number of friends may be looking to increase their social support. Similarly, those students

who already have a larger number of friends may be less motivated to meet new people through their leisure.

#### 4.4 Comparing gamers and non-gamers on key constructs

Just under half of the students (47.7%) participated in gaming. This percentage is lower than the scan conducted by Entertainment Software Association of Canada (2020) that reported 61% of all Canadians play video games, although differences between the samples and the way in which gaming was measured likely account for the discrepancy. In this sample of students, the 25 to 29-year-old group had the highest percentage of gamers, with the lowest being among students 30 years of age and older (see Table 9), but these differences in participation based on age are not significant. The lower participation among older students contrasts, too, with the average age of 34 years among Canadian gamers according to the Entertainment Software Association of Canada (2020).

Table 9. Participation in gaming by age group

Age group	Gaming Participation <sup>a</sup>		Total
	Gamer	Non-gamer	
19 years and under	103 (49.0)	107 (51.0)	210 (25.8)
20 to 24 years	157 (47.1)	176 (52.9)	333 (41.0)
25 to 29 years	65 (55.6)	52 (44.4)	117 (14.4)
30 years and older	63 (41.2)	90 (58.8)	153 (18.8)
<b>Total</b>	388 (47.7)	425 (52.3)	813 (100.0)

<sup>a</sup> In each cell, frequency shown above with percentage below in parentheses.  
 $\chi^2 = 5.697$ ,  $df = 3$ ,  $p = .127$

Significantly more males (62.9%) than females (41.5%) identified as gamers (see Table 10). Previous research has indicated that gaming is more often seen as a male oriented activity (Fox & Tang, 2014; Lucas & Sherry, 2004), so this finding is not surprising. In this sample of students, the percentage of females participating in gaming remains largely the same across all age groups, whereas the percentage of males declines as they get older.

Table 10. Participation in gaming by sex

<b>Sex</b>	<b>Gaming Participation<sup>a</sup></b>		<b>Total</b>
	<b>Gamer</b>	<b>Non-gamer</b>	
Male	149 (62.9)	88 (37.1)	237 (29.0)
Female	240 (41.5)	339 (58.5)	579 (71.0)
<b>Total</b>	389 (47.7)	427 (52.3)	816 (100.0)

<sup>a</sup> In each cell, frequency shown above with percentage below in parentheses.  
 $\chi^2 = 30.925$ ,  $df = 1$ ,  $p = <.001$

Gaming is engaged in by similar percentages of both domestic and international students with only about 5% more domestic students being gamers (see Table 11). Also, with respect to the intensity of their involvement in gaming, international students participate very slightly more hours per day on average ( $M = 1.29$ ,  $SD = 1.42$ ) than domestic students ( $M = 1.21$ ,  $SD = 0.98$ ), but the difference is not significant ( $t = .475$ ,  $p = .636$ ). Even though just under 50% of both student status groups participate in gaming, their motives for doing so may vary.

Table 11. Participation in gaming by student status

<b>Student Status</b>	<b>Gaming Participation<sup>a</sup></b>		<b>Total</b>
	<b>Gamer</b>	<b>Non-gamer</b>	
Domestic	331 (48.7)	348 (51.3)	679 (83.8)
International	57 (43.5)	74 (56.5)	131 (16.2)
<b>Total</b>	388 (47.9)	422 (52.1)	810 (100.0)

<sup>a</sup> In each cell, frequency shown above with percentage below in parentheses.  
 $\chi^2 = 1.207$ ,  $df = 1$ ,  $p = .272$

Gamers report feeling significantly more socially isolated than non-gamers (see Table 12). This result is concerning because people may be reducing time spent socializing in favour of isolating themselves from the real world (Williams et al., 2008). Further, video game addiction has been connected to multiple negative psychological and social outcomes (Gentile et al., 2011; Caplan et al., 2009; Lemmens et al., 2009). Despite the difference in feelings of social isolation,

both gamers and non-gamers are very similar in the degree to which they are socially motivated by their engagement in leisure pursuits. However, when gamers and non-gamers are distinguished based on being an international or domestic student, there is a striking difference in the degree to which the social motive is important. Subsequent analysis revealed a significant interaction effect ( $F = 6.745, p = 0.010$ ) whereby international students who game are much more socially motivated in their leisure ( $M = 5.25, SD = 1.06$ ) than are domestic students who game ( $M = 4.71, SD = 1.02$ ). Taking into consideration the findings concerning social isolation, this outcome suggests that feelings of social isolation may be felt more acutely by domestic students who game because they are significantly less socially motivated by this leisure pursuit.

Table 12. A comparison of gamers and non-gamers on social isolation and social motive

<b>Concept</b>	<b>n</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>t</b>	<b>p</b>
Gaming participation					
<b>Social isolation<sup>a</sup></b>					
Gamers	421	3.49	1.47	2.664	.008
Non-gamers	447	3.23	1.38		
<b>Social motive<sup>a</sup></b>					
Gamers	408	4.83	1.05	.414	.679
Non-gamers	441	4.79	1.08		
<b>Number of friends</b>					
Gamers	430	3.79	3.12	.640	.522
Non-gamers	475	3.93	3.33		
<b>Social climate and bonds<sup>a</sup></b>					
Gamers	421	4.92	1.05	.083	.934
Non-gamers	447	4.92	1.08		

<sup>a</sup> Based on a 7-point agreement scale.

Both gamers and non-gamers report having on average just under four close friends (see Table 12). Given their difference in feelings of social isolation, this result suggests that while the *quantity* of close friends is about the same, the *quality* of those friendships may differ. However, belying that interpretation is the identical perceptions held by gamers and non-gamers of their social climate and bonds.

Gamers report a significantly larger leisure repertoire than their non-gaming peers (see Table 13), which indicates gamers engage in more leisure activities outside of gaming than non-gamers. However, a diverse leisure repertoire does not indicate the frequency with which

individuals participate in their preferred activities. Consequently, while non-gamers may have a smaller repertoire of activities than gamers, they might participate more frequently in one or more of those activities. Nevertheless, gamers do report a larger number and more diverse group of leisure activities than non-gamers, which might be unexpected if their gaming is especially intense (i.e., occupies a large proportion of their leisure time).

Table 13. A comparison of gamers and non-gamers on leisure repertoire

<b>Gaming participation</b>	<b>Leisure Repertoire<sup>a</sup></b>			<b>t</b>	<b>p</b>
	<b>n</b>	<b>Mean</b>	<b>Std. Dev.</b>		
Gamers	430	9.21	3.124	-7.096	<.001
Non-gamers	479	7.66	3.443		

<sup>a</sup> Number of activities participated in beyond gaming reflecting the diversity of leisure activities.

Statistically, gamers and non-gamers did not appear to be significantly different in their life satisfaction ( $t = 1.779, p = .076$ ), but non-gamers do report a higher level of wellbeing than gamers (see Table 14). In other words, while the difference between the groups might not meet the statistical convention of .05 probability, there is still a very low likelihood (i.e., less than .08) that the difference between them is simply due to chance.

Table 14. A comparison of gamers and non-gamers on life satisfaction

<b>Gaming participation</b>	<b>Life Satisfaction<sup>a</sup></b>			<b>t</b>	<b>p</b>
	<b>n</b>	<b>Mean</b>	<b>Std. Dev.</b>		
Gamers	391	6.63	2.357	1.779	.076
Non-gamers	422	6.93	2.400		

<sup>a</sup> Based on a 10-point satisfaction scale where higher scores reflect greater overall life satisfaction.

While this outcome is somewhat unexpected given previous research of the negative consequences of gaming, it may be the result of considering only whether or not individuals are gamers rather than the *intensity* of their gaming (i.e., how frequently they engage in gaming). By examining the intensity of gaming, along with the other factors being considered in this study, insights into any differences between gamers and non-gamers' wellbeing might be revealed.

#### **4.5 Relationship of gamers' intensity of participation to key concepts**

In this section, the intensity of gaming was explored for just those students who engage in gaming. Previous research has explored the positive and negative effects of gaming on wellbeing and how gaming can interfere with social functioning and wellbeing (Stockdale & Coyne, 2018; Weinstein, 2010). How much time an individual participates in gaming is a strong predictor of a gaming disorder (Dieris-Hirche et al., 2020). Indeed, excessive gaming has been associated with many negative psychological and social outcomes (Caplan et al., 2009; Gentile et al., 2011; Lemmens et al., 2009). However, Brunborg et al. (2014) state that these negative outcomes are specifically related to video gaming addiction and that the intensity of playing alone was not necessarily associated with these negative outcomes.

As a first step in this analysis, gaming intensity was examined for its relationship to the various key concepts being considered (see Table 15). Gaming intensity was positively associated with students' social motive for leisure participation ( $r = .094, p = .050$ ), suggesting that those students with a stronger social motive may engage in gaming as a platform to meet new people. Online social interactions may be a core factor driving gaming participation (Choi & Kim, 2004; Jansz & Martens, 2005) and gamers themselves reportedly do consider it to be a social activity (Cole & Griffiths, 2007; Griffiths et al., 2003, 2004; Khanolkar & McLean, 2012; Ream et al., 2013). The statistically significant link between gaming intensity and social motive is consistent with previous research (Johnson et al., 2016; Williams et al., 2008).

Also, gaming intensity was strongly associated with the size of the students' leisure repertoire ( $r = .316, p < .001$ ). Despite the higher intensity in gaming, individuals are participating in a variety of other leisure activities during their free time, although as noted earlier, the diversity of leisure activities captured in the measure of leisure repertoire does not reflect the frequency of participation in these other activities. In other words, more gaming intensity might be linked to a larger leisure repertoire, but it remains unclear if the time spent in those activities is also greater.

Although previous research indicating that extensive gaming can be associated with loneliness (Caplan et al., 2009), gaming intensity is not significantly related to social isolation for this student sample ( $r = .043, p = .354$ ). Even though a higher social motive is significantly related to greater gaming intensity, neither the number of close friends nor perceived social

climate and bonds are related to gaming intensity (see Table 15). While gaming might provide a space for people to find and build community with those with the same interests, how intensely they play does not appear to contribute to social connectedness.

Table 15. The relationship of gamers’ participation intensity with key concepts

Concept Dimension	Gaming intensity		
	n	r	p
<b>Social antecedents</b>			
Social isolation	467	.043	.354
Social motive	438	.094	.050
<b>Social connectedness</b>			
Number of close friends	486	.029	.527
Social climate and bonds	467	.022	.630
<b>Leisure repertoire</b>	488	.316	<.001
<b>Wellbeing</b>	426	-.096	.048

Consistent with many previous studies, higher gaming intensity was associated with lower wellbeing ( $r = -.096, p = .048$ ). Given the mixed results of the degree to which other concepts considered here are related to gaming intensity, this significant association with wellbeing, albeit relatively weak, requires an exploration of the interplay of these factors in collectively explaining variations in wellbeing is warranted.

#### 4.6 Relationship of gaming and key concepts to wellbeing

To further understand the relationship between gaming intensity and wellbeing, the combined effect of all these factors was considered next. A hierarchical regression model was run with each stage introducing a group of factors based on the conceptual framework introduced earlier (see Figure 1). At stage 1, the factors sex, age, and whether the student was domestic or international or not were entered as control variables. At stage 2, the principal explanatory factor – gaming intensity – was entered to identify its independent contribution to wellbeing beyond the effect of the control factors. Stage 3 introduced the students’ social motive as a factor that might mitigate any effect of gaming intensity on wellbeing, and finally at stage 4, the three key concepts related to social connectedness and leisure repertoire were to explore the extent to which they amplified or reduced the effect of gaming intensity on wellbeing. The results of the 4-stage model are shown in Table 16.

None of the control variables – sex, age, or student status – taken individually or together, explained a significant proportion of the variation in wellbeing, as measured by life satisfaction. Collectively, they explained less than 1% of the variation in wellbeing ( $R^2 = .006$ ,  $F = .845$ ,  $p = .470$ ). Similarly, the introduction of gaming intensity at stage 2 did not make a significant contribution to explaining wellbeing. The significant negative relationship reported earlier was not apparent after controlling for the three characteristics of the students.

Given previous research describing the negative impact gaming intensity has on player's wellbeing, this outcome is somewhat surprising. However, it might be reflective of Brunborg et al.'s (2014) argument that length of time gaming alone was not necessarily associated with negative social, emotional, and psychological outcomes. Presumably, other factors above and beyond gaming intensity must explain variations in the wellbeing of the students.

Social leisure motive was introduced at stage 3 of the analysis and was a significant factor in explaining student wellbeing ( $\beta = .333$ ,  $p < .001$ ). The more students are motivated to participate in leisure by social outcomes, the higher their overall wellbeing regardless of how intensely they participate in gaming.

Finally, at stage 4 of the analysis, the factors associated with students' social connectedness as well as the diversity of their leisure repertoire were introduced into the model. The more objective indicator concerning the number of friends reported by the students was not significant, but the factors related to students' perceptions of their social connections were significant and were more important in explaining their wellbeing than any other factors. Social isolation was most critical, in that their feelings of social isolation had a significantly detrimental effect on wellbeing ( $\beta = -.263$ ,  $p < .001$ ). In addition, the students' perception of their social climate and bonds had a significant positive effect on wellbeing ( $\beta = .188$ ,  $p = .001$ ). Once all these factors had been taken into account, the students' leisure repertoire did not make a significant contribution in explaining wellbeing ( $\beta = .073$ ,  $p = .113$ ).

Table 16. Contribution of Selected Demographics, *Gaming Intensity*, Social Connectedness, and Leisure Repertoire to Wellbeing ( $n = 403$ )

Dimension Variable	Stage 1		Stage 2		Stage 3		Stage 4	
	$\beta$	$p$	$B$	$p$	$\beta$	$p$	$\beta$	$p$
<b>Demographics</b>								
Sex <sup>a</sup>	.008	.882	.005	.916	.032	.511	.031	.485
Age	.067	.181	.064	.206	.093	.052	.076	.082
Student status <sup>a</sup>	.047	.357	.047	.357	.003	.957	-.018	.687
<b>Gaming intensity</b>			-.060	.234	-.066	.162	-.058	.183
<b>Social leisure motive</b>					<b>.333</b>	<b>&lt;.001</b>	<b>.155</b>	<b>.002</b>
<b>Social connectedness</b>								
Social isolation							<b>-.263</b>	<b>&lt;.001</b>
Number of friends							.036	.438
Social climate							<b>.188</b>	<b>.001</b>
<b>Leisure repertoire</b>								
	$R^2$	.006		.004		.107		.156
	Total $R^2$	.006		.010		.117		.272
	$F$	.845		1.1418		47.937		21.062
	$p$	.470		.234		<.001		<.001

Notes: <sup>a</sup> Binary variables. For sex, male =0 and female =1. For student status, domestic student = 0 and international student = 1. Significant standardized regression coefficients ( $\beta$ ) shown in **bold**.

Along with their social motive for participating in leisure – which remained a significant factor at this final stage – the social context of student life is clearly most important in explaining their wellbeing irrespective of how intensely they participate in gaming. Reducing feelings of social isolation appears to be the most significant factor in enhancing student wellbeing as well as ensuring that they feel they have supportive social connections. Despite some literature stating how gaming intensity can have a negative impact on wellbeing, it alone appears not to be a significant factor. Taking into consideration Brunborg et al.'s (2014) belief that the amount of time spent gaming would not necessarily lead to negative outcomes, a second analysis was conducted where gaming intensity was replaced in the regression model with a binary variable separating between the students who did game (value = 1) and those who did not (value = 0). The results are shown in Table 17.

The results from this second regression analysis reaffirm the significance of the same factors concerning students' social context in explaining their wellbeing. Whether or not students participate in gaming was not related to their wellbeing, and feelings of social isolation ( $\beta = -.278, p < .001$ ), the importance of the social motive ( $\beta = .156, p < .001$ ), and perceptions of social climate and bonds ( $\beta = .134, p = .001$ ) again emerged as most important and to much the same degree. A difference in this model, however, is the emergence of age and leisure repertoire as significant factors in explaining wellbeing, presumably due to the inclusion of non-gamers. As noted earlier, wellbeing among the students increases with age and is higher when leisure repertoires are more diverse. Gaming represents just one of numerous leisure activities in which students participate and those with larger leisure repertoires were found to have greater wellbeing regardless of whether or not gaming is one of their leisure time pursuits. Ultimately, what is most apparent is the social context is most important in explaining variations in wellbeing, above and beyond other factors including gaming participation.

Table 17. Contribution of Selected Demographics, Gaming Participation, Social Connectedness, and Leisure Repertoire to Wellbeing (n = 766)

Dimension Variable	Stage 1		Stage 2		Stage 3		Stage 4	
	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>
<b>Demographics</b>								
Sex <sup>a</sup>	.010	.795	-.003	.941	.012	.741	-.006	.855
Age	<b>.079</b>	<b>.028</b>	<b>.078</b>	<b>.032</b>	<b>.111</b>	<b>.001</b>	<b>.096</b>	<b>.002</b>
Student status <sup>a</sup>	-.014	.707	-.018	.635	-.041	.238	-.054	.090
<b>Gaming participation<sup>b</sup></b>			-.054	.146	-.050	.155	-.050	.123
<b>Social leisure motive</b>					<b>.344</b>	<b>&lt;.001</b>	<b>.156</b>	<b>&lt;.001</b>
<b>Social connectedness</b>								
Social isolation							<b>-.278</b>	<b>&lt;.001</b>
Number of friends							.062	.060
Social climate							<b>.134</b>	<b>.001</b>
<b>Leisure repertoire</b>							<b>.128</b>	<b>&lt;.001</b>
<i>R</i> <sup>2</sup>	.007		.003		.116		.156	
Total <i>R</i> <sup>2</sup>	.007		.009		.126		.281	
<i>F</i>	1.722		2.113		100.977		40.927	
<i>p</i>	.161		.146		<.001		<.001	

Notes: <sup>a</sup> Binary variables. For sex, male =0 and female =1. For student status, domestic student = 0 and international student = 1.

<sup>b</sup> Binary variable where 0 = does *not* participate in gaming and 1 = does participate in gaming.

Significant standardized regression coefficients ( $\beta$ ) shown in **bold**.

## 5.0 Discussion and Conclusion

This study set out to explore the relationship between gaming and wellbeing among post-secondary students while considering the player's motivation, social connectedness, and leisure repertoire. In this chapter, I will summarize and discuss the findings guided by the research questions: What is the relationship between gaming and wellbeing? To what extent does gaming behaviour intersect with social connectedness ultimately affect wellbeing? Does the relationship between gaming and wellbeing differ for male and female students? Is the relationship between gaming and wellbeing influenced by one's leisure repertoire? To what extent are social motives related to the intensity of gamers' participation? How do the previous factors collectively contribute to or detract from a gamer's overall wellbeing? Does the intensity of engagement in gaming vary between domestic and international students? Finally, I will acknowledge the study's limitations and offer recommendations for future research that may shed further light on the relationship between gaming and wellbeing.

### 5.1 Reflections on the results

There does not appear to be a significant relationship between gaming and wellbeing. This finding contradicts previous research that associated gaming with either negative (Stockdale & Coyne, 2018; Weinstein, 2010) or positive outcomes (Gitter et al., 2013; Kowert & Oldmeadow, 2015; Martončik & Lokša, 2016; Ryan et al., 2006). Indeed, my results did not support either narrative that gaming is necessarily either good or bad. Gaming is not solely positive or solely negative, but rather, is likely to have outcomes related to both simultaneously. The challenge is to facilitate the potential for positive outcomes of gaming and minimizing its negative outcomes, which the results suggest can be done by taking into account the context by which participants enter into gaming. The results also reinforce previous research that indicated the *intensity* of gaming alone does not appear to be associated with negative social, emotional, and psychological outcomes (Brunborg et al., 2014). This contradicts Grüsser et al. (2007) who found that time spent gaming was negatively correlated with a player's wellbeing. Although previous research indicating that extensive gaming can be associated with loneliness (Caplan et al., 2009), gaming intensity is not significantly related to social isolation for this student sample ( $r = .043, p = .354$ ). Even though a higher social motive is significantly related to greater gaming

intensity, neither the number of close friends nor perceived social climate and bonds are related to gaming intensity (see Table 15).

By exploring the relationship between gaming and wellbeing, this study found that other factors play a more influential role in students' wellbeing than simply how intensely they game. Despite multiple studies identifying the negative effects video gaming can have on a player's wellbeing (Stockdale & Coyne, 2018; Weinstein, 2010) especially excessive amounts (Boxer et al., 2015), whether or not students participate in gaming or how intensely they play do not have a significant role in explaining a player's wellbeing. While the difference in life satisfaction between gamers and non-gamers is not significant, gamers still report a notably lower level of life satisfaction suggesting that gaming might be having a detrimental affect on their wellbeing, possibly due to greater feelings of social isolation (see Table 14). Some previous research identified the benefits video gaming may have on one's wellbeing by helping with stress reduction and relaxation (Russoniello et al., 2009; Snodgrass et al., 2011; Wack & Tantleff-Dunn, 2009) and positively influencing aspects of social wellbeing (Gitter et al., 2013; Kowert & Oldmeadow, 2015; Martoncik & Loksa, 2016). As the results were not significant, this suggests that such benefits are unlikely to have resulted.

Previous research has established the vital role social relationships have in contributing to better subjective wellbeing (Yoon et al., 2008). Research has consistently shown that having greater perceived social support is strongly associated with better psychological wellbeing and health outcomes (Fleming et al., 1982; Gurung et al., 1997; Lin et al., 1999; Piquart & Duberstein, 2010; Uchino, 2004) and social connectedness is a critical factor in enhancing psychological wellbeing (Mauss et al., 2011; Yoon et al., 2012). In this study, gamers reported feeling more socially isolated than their non-gaming peers (see Table 12), supporting previous research that has suggested players may be isolating themselves, which may have a negative impact on their daily lives (Weinstein, 2010). Given that gaming does not appear to be related to any other factor of social connectedness, (i.e., number of close friends, and social climate and bonds), there might be serious implications for the degree to which these social aspects could *further* enhance wellbeing through gaming. In other words, we know social connectedness is an important contributor to wellbeing and if gaming actually did have stronger links to improving

social connectedness, then the effect would translate into an even greater contribution to wellbeing.

Multiple researchers have recognized video gaming as a male dominated space (Fox & Tang, 2014; Hainey et al., 2011; Lucas & Serry, 2004). This continues to be the case as the sample in this study has significantly more males (62.9%) than females (41.5%) that identified as gamers. Video game players are typically adolescent or early adult males, however, there has been a steady increase in female gamers and older gamers in more recent years (Dale & Green, 2017). This study illustrated that a significant portion of both adolescents and adults participate in video gaming as a leisure activity, similar to what has been reported previously (Brooks et al., 2016; Entertainment Software Association of Canada, 2020; Perrin, 2018).

Leisure participation can provide international students with the opportunity to develop friendships and provide social support (Iwasaki, 2007), which are both critical to their success in their new environment (Sherry et al., 2010). The motive for social connections through gaming was more apparent among international students, as they reported being more socially motivated to participate than domestic students. This higher social motive among international students does not appear to be attributable to greater feelings of social isolation because in this respect, they were not any different from their domestic peers. However, when international and domestic students are distinguished based on whether or not they are gamers, there is a striking difference in the degree to which the social motive is important. Subsequent analyses revealed that international students who are gamers are much more socially motivated in their leisure than are domestic students who game. Taking into consideration the findings concerning social isolation, this outcome suggests that feelings of social isolation may be felt more acutely by domestic students who game because they are significantly less socially motivated by this leisure pursuit.

Findings from this study also highlight the positive relationship between the breadth of an individual's leisure repertoire with one's wellbeing (Kim & Kim, 2009; Lee et al., 2016). As gaming is one part of a player's leisure repertoire, ensuring a diversity of leisure activities within one's leisure repertoire may mitigate negative impacts to wellbeing. Further, the diversity of *types* of activities that comprise one's leisure repertoire may also be just as important as the *number* of activities that comprise it. For example, a repertoire of *all* active leisure pursuits

versus a similarly sized repertoire made up of a *mix* of active, cultural, passive, and social activities is less diverse in its composition. Would a greater mix of different types of activities *further enhance* wellbeing?

## **5.2 Limitations**

One limitation of this study is rooted in the nature of using secondary data, as it limits the control over the variables and factors examined in the study. The Georgian College Student Wellbeing Survey provided a fairly broad measure of gaming, and consequently, was not sufficiently refined to get at the different platforms for video games (i.e., phone, console, or PC) and different genres to which much of the literature speaks (e.g., Massively Multiplayer Online Role Playing Games [MMORPGs], Multiplayer Online Battle Arena [MOBA]). A more specific measure might have resulted in different outcomes concerning the effect of gaming on wellbeing.

A second limitation is that self-reported responses could be subject to bias due to social desirability. Some forms of gaming may be stigmatised as a socially unacceptable form of leisure – even considered taboo – or used as a form of procrastination, and consequently, students may under-report the specific frequency and duration of their gaming. In other words, students may provide answers that are unintentionally biased by social norms and expectations.

## **5.3 Future Research**

This study has revealed numerous opportunities for future research. Findings indicate that there is no significant difference between males and females in the degree to which they are socially motivated to participate in leisure (see Table 3). Comparing the social motives for male and female specifically for gamers may produce a different result as previous research has stated that males and females have different motives for engaging in gaming (Yee, 2006). Since motivation behind an individual's game play is a critical factor in the effect of gaming on wellbeing (Carras et al., 2017; Lafreniere et al., 2009), other motives such as achievement and escapism would be worthwhile to examine. Further, players may be motivated by multiple motives rather than just a single motive (Demetrovics et al., 2011; Hilgard et al., 2013; Lafrenière et al., 2012; Yee, 2006b). Exploring the different motives for gaming would also provide insight on differences amongst gamers based on their age, gender, and student status.

Authors have speculated that the social interactions with other players is a core component driving participation in online games (Choi & Kim, 2004; Jansz & Martens, 2005). Future research could consider how important engaging with others is to a player's gaming experience because the desire for real social engagement is a step beyond simply being socially motivated. Relatedly, an exploration of different gaming platforms and genres might help to clarify the relationships among social context, wellbeing, and gaming. Further, future research could determine the directionality of the relationship between gaming and the player's social context; that is, do feelings of social isolation lead to gaming or does gaming lead to greater feelings of social isolation? Would examining the level or desire for social engagement through gaming help to resolve this conundrum?

#### **5.4 Implications**

This study contributes to our overall understanding of gaming as a leisure activity and its relationship to wellbeing in young adults. The results can be informative in supporting student's wellbeing by recognizing where potential risks associated with gaming may exist and can be mitigated. A critical risk factor to student's wellbeing is their feelings of social isolation and gamers appear to be significantly more socially isolated than their non-gaming peers. If social isolation is diminishing one's wellbeing through gaming participation, an important step could be to minimize a player's feelings of social isolation by helping them to form meaningful relationships. These quality bonds can be formed by connecting the players with others in their peer group that share their interests and encouraging them to get involved in their community (e.g., participating in clubs, student associations, community events). Although there remain opposing opinions on the degree to which gaming affects wellbeing, we are reminded how powerful social connections are to our wellbeing. As gaming grows as a popular leisure activity for students, the relationship between gaming, wellbeing and social context warrants more in-depth exploration. A clearer understanding of this relationship may help players enhance their wellbeing while avoiding the potential risks.

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## Appendix 1. Georgian College Student Wellbeing Survey

This facsimile of the original questionnaire developed by the Canadian Index of Wellbeing and administered online to students at Georgian College in 2019 includes only those questions used in this study.



### Welcome to the Georgian College Student Wellbeing Survey!

In this survey, you'll be asked a variety of questions on everything from your physical and mental health, to how much time you spend online and what you like to do for fun in the community.

Your input will help to:

- identify gaps, barriers and areas where we can better support you
- improve and inform policies and practices
- enhance college resources and services

All responses are confidential.

The survey will take approximately 20 minutes to complete.

You could win a \$300, \$150, or \$50 Georgian Stores gift card! Simply enter the draw at the end of the survey.

Thanks for sharing your voice!

And remember, [free counselling is available at Georgian](#) if you ever want to talk.

## Section A: Community Vitality

**A3.** How many *relatives* (including uncles, aunts, cousins) do you have who you feel close to, that is, who you feel at ease with, can talk to about what is on your mind, or call on for help?

Number of relatives: \_\_\_\_\_ relatives

**A4.** How many *close friends* do you have, that is, people who are not your relatives, but who you feel at ease with, can talk to about what is on your mind, or call on for help?

Number of close friends: \_\_\_\_\_ close friends

**A7.** For each of the following statements, please indicate the extent to which you agree by checking the circle that best describes ***how you feel about Georgian.***

<b>“Thinking about Georgian as place to learn...”</b>	Very strongly disagree ↓	Strongly disagree ↓	Disagree ↓	Neutral/ not sure ↓	Agree ↓	Strongly agree ↓	Very strongly agree ↓
Many people in this college are available to give help if somebody needs it .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have good friends in this college.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This college provides opportunities for me to do a lot of different things.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had a problem, few people in this college would try to help me .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel that I lack companionship.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel at ease with the students at this college ....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I need help, this college has many excellent services to meet my needs .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In this college, people are not willing to help those in need .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel left out .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People are sociable at this college .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is never much to do at this college .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel isolated from others.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had an emergency, even people I do not know at this college would be willing to help me .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult for me to connect with the people in this college .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have few opportunities to satisfy my needs at this college .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend this college to others as a great school to attend .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am proud to be a student at this college .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section B: Healthy Populations

- B8. For the types of physical activities listed below that you might participate in during your free time, please indicate the **total number of times** you participate **in a typical month**. If you do *not* participate in the activity, please report "0" (zero) or leave the space blank.

	Total number of times <i>in a typical month</i>
<b>Vigorous exercise</b> (e.g., aerobics, jogging, weight training, sports) .....	_____ times
<b>Light exercise</b> (e.g., going for a walk, bicycling) .....	_____ times

## Section E: Leisure and Culture

- E1. For each of the activities listed below, please indicate the **total number of times** you participated in each activity **in a typical month while attending Georgian**. If you do *not* participate in the activity, please report "0" (zero) or leave the space blank.

	Total number of times <i>in a typical month</i>
<b>Socializing off-campus with friends</b> (e.g., getting together, dining out) ....	_____ times
<b>Going out to movies</b> .....	_____ times
<b>Going out to clubs, bars, taverns</b> .....	_____ times
<b>Going to sports events as a spectator</b> .....	_____ times

- E2. For each of the activities listed below that are **typically done at home**, please indicate the **total number of times** you participated in each activity **in a typical week**.

	Total number of times <i>in a typical week</i>
<b>Reading</b> books, newspapers, and/or magazines for pleasure .....	_____ times
<b>Playing board or card games</b> .....	_____ times
<b>Doing puzzles</b> such as crosswords, Sudoku, jigsaw .....	_____ times
<b>Hobbies</b> such as knitting, crafts, woodworking .....	_____ times

- E3. For each of the cultural activities listed below, please indicate the **total number of times** you participated in each activity **while attending Georgian**. If you do *not* participate in the activity, please report "0" (zero) or leave the space blank.

	Total number of times <i>in past year</i>
Attending music concerts, .....	_____ times
Visited art galleries/museums .....	_____ times
Attended festivals .....	_____ times
Attended dance performances .....	_____ times
Attended live theatre.....	_____ times

**E4.** For each of the **computer-related activities** listed below, please indicate the **total number of times** you participated in each activity for leisure **on a typical day** (be sure to count *each separate time* you participated).

	Total number of times on <i>a typical day</i>
<b>Searching the internet</b> for interest .....	_____ times
<b>Playing computer games</b> (including online, console, & handheld) .....	_____ times
<b>Socializing with others online</b> (e.g., Instagram, Skype, texting) .....	_____ times

**E5.** Overall, how much **time in total** on a **typical day** do you spend engaged in computer and/or electronic device-related activities *for leisure*? \_\_\_\_\_ hours and \_\_\_\_\_ minutes per day

**E6.** Thinking about your typical television and/or online viewing...

How much **time in total** on a **typical day** do you spend watching television, DVDs, or shows/movies online? \_\_\_\_\_ hours and \_\_\_\_\_ minutes per day

**E9.** For each statement below, please indicate the extent to which you agree that it is something you get out of your leisure time.

	Very strongly disagree ↓	Strongly disagree ↓	Disagree ↓	Neutral/ not sure ↓	Agree ↓	Strongly agree ↓	Very strongly agree ↓
My leisure provides opportunities to try new things.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure provides me with opportunities for social interaction with others.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure helps me to relax.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I participate in leisure that develops my physical fitness.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure helps me to learn about myself .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure has helped me to develop close relationships with others .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure helps relieve stress .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I participate in leisure that restores me physically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure helps me to learn about other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure is most enjoyable when I can connect with others.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure contributes to my emotional wellbeing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My leisure helps me to stay healthy .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section F: Education

F2. Have you taken any **courses for interest** (e.g., learning a language, practising yoga, learning to play a musical instrument) in the community, at Georgian, or online in the time that you have attended Georgian? .....  Yes  No

If **yes**, how many courses did you take *for interest* in the time that you have attended Georgian?

Number of courses taken for interest: \_\_\_\_\_ courses

## Section I: Overall Health and Wellbeing

I3. Finally, how satisfied are you with your life in general?

Very dissatisfied										Very satisfied
↓	2	3	4	5	6	7	8	9	↓	
<input type="radio"/>										

## Section J: Personal Characteristics

In this final section, we would like to know more about the students at Georgian so we can create groupings and see if some students have higher or lower experiences of wellbeing than others.

J4. What was your sex at birth? .....  Male  Female

J6. What is your current age? ..... \_\_\_\_\_ years of age

J12. Are you an International student? .....  Yes  No