Basic psychological needs and passion: Exploring predictors of problematic video gaming
behaviours

by

Jonathan S. Capaldi

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Jonathan S. Capaldi

Abstract

Problematic video gaming is a growing concern across the world. Critically, when video gaming interferes with the pursuit of life goals or begins to negatively affect other life domains (e.g., work, school, relationships), they are described as problematic gaming behaviours. Researchers have linked problematic gaming behaviours to negative outcomes in a variety of contexts, such as university performance and mental illness. However, research is only beginning to examine why problematic gaming develops. I explored possible relations between psychological needs frustration, obsessive passion, and problematic gaming behaviours. A direct model and a mediation model were explored across 2 studies. Study 1 found a small effect of psychological needs frustration, and a large effect of obsessive passion, whereas the indirect effect was not statistically significant. Study 2 recruited a larger sample targeted towards gamers and replicated the direct effects of study 1 and found a significant indirect effect in the mediation model.

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Problematic video-gaming is a growing concern across the world. Critically, when video gaming interferes with the pursuit of other life goals or begins to negatively affect other life domains (e.g., work, school, interpersonal relationships), they can be described as problematic gaming behaviours. In Asian countries, for instance, prevalence rates of problematic video gaming are 5.9% in Korea (Yu & Cho, 2016), 3.9% in China (Xu et al. 2012), and 8.7% in Singapore (Choo, Gentile, Sim, Li, Khoo, & Liau, 2010). In Europe and North American countries, the prevalence rates are relatively lower with .7% in USA, the UK, Canada, and Germany (Przybylski, Weinstein, & Murayama, 2016) as well as ranges from .06% to 2.5% across European countries with the average prevalence rate reaching 1.6% (Müller 2015). In short, problematic gaming behaviours are a concern across countries.

Lemmens, Valkenburg, and Peter (2009) have attributed seven aspects that occur when an individual has problematic gaming behaviours. The first aspect is video game salience wherein the individual, is unable to stop thinking about gambling, such as being reminded of video games by mundane occurrences throughout their day. The second aspect for individuals whom have problematic gaming habits is an increased tolerance for gaming, similar to drug tolerance seen in substance addictions. Individuals require longer gaming sessions to feel the same pleasure or satisfaction from gaming. The third aspect of problematic gaming behaviours is mood modification, wherein the individuals rely on video games to escape their current negative moods. Problematic gamers will use video games as a distraction from other negative emotions. The fourth aspect is relapse when trying to change their behaviours. Similar to other addictions individuals trying to change their problematic gaming behaviour will fall back into their same habits, which brings about the fifth aspect: withdrawal. Individuals with problematic gaming behaviours will feel withdrawal as a growing need that causes discomfort until they are

able to play games again. Problematic gaming behaviours will cause the sixth aspect: interpersonal conflict with their family and friends. This generally occurs when family and close friends address the problematic gaming and the individual reacts in a negative way. Lastly, the seventh aspect: suggests that these types of gaming behaviours cause problems within the individuals' life, such as missing work or extracurricular activities in order to play video games.

Researchers have linked problematic gaming behaviours to negative outcomes in a variety of contexts. For instance, problematic video gaming is associated with poor academic performance. Research has shown that problematic engagement in video gaming is associated with lower Scholastic Assessment Test (SAT) scores (Anand, 2007), lower grades among elementary school students (Skoric, Teo, & Neo, 2009), lower Grades Point Average (GPA) among first year university students (Schmitt, and Livingston, 2015), and lower academic achievement in general (Brunborg, Mentzoni, & Frøyland, 2014; Chiu, Lee, & Huang, 2004).

Problematic gaming behaviour has also been linked to negative perceptions of the self and mental illness. Researchers, for example, have found that problematic gaming is linked to loneliness (Kim, LaRose, & Peng, 2009), anxiety due to lack of adaptive coping mechanisms (Loton, Borkoles, Lubman, & Polman, 2016), and depression (Desai, Krishnan-Sarin, Cavallo, & Potenza, 2010). Rehbein, Psych, Kleimann, Mediasci, and Mößle (2010) also showed that ninth-grade students who engaged in more problematic gaming behaviours were also more likely to have thoughts of committing suicide relative to ninth-grade students who engaged less in problematic gaming behaviours. Thus, it is important to understand who is more likely to develop problematic gaming behaviours and the mechanisms that maintain problematic gaming.

Research is only beginning to examine why problematic gaming develops. It is not necessarily the amount of time spent playing the games that defines problematic gaming. Indeed,

Ng and Wiemer-Hastings (2005) showed that individuals who spend a large amount of time gaming and enjoy their virtual world more than their concrete world did not report unhealthy behaviours towards the game (e.g., getting frustrated when unable to play). Individuals reported being able to find enjoyment in activities other than the game, and do not experience negative moods when unable to play. This means that there is more to problematic gaming behaviours than just time spent playing, as this time may not negatively affect other life domains. I propose that when psychological needs are not fulfilled in daily life outside the game (such as invalidation at work or a lack of social support; Reinecke, 2009), individuals may turn to playing video games as an escape, which increases their risk for problematic gaming (Hellström, Nilsson, Leppert, & Åslund, 2012). In my Master's thesis, I examine problematic gaming from the perspective of self-determination theory (i.e., frustrated needs; Deci & Ryan 1985) and examine passion (Vallerand et al. 2003) for which an individual plays video games.

Frustrated Basic Psychological Needs and Problematic Gaming

I propose that frustrated basic psychological needs within the framework of self-determination theory (Deci & Ryan, 1985) helps explain why some people may develop problematic gaming behaviours. According to the developers of self-determination theory (Deci & Ryan, 1985, 2000), humans have three psychological needs that motivate and guide behaviour: autonomy, competence, and relatedness that motivate and guide behaviour. Perceived autonomy is the feeling that an individual is in control of their own life and has the freedom to make their own choices (Deci & Ryan, 1985b). Of note, autonomy supportive environments that create feelings of agency in one's life choices have been shown to promote well-being and higher levels of motivation in a variety of life domains such as sports (Gagné 2003), university (Fazey & Fazey, 2001), the workplace (Slemp, Kern, & Vella-Brodrick, 2015), and grade school (d'Ailly,

2003). Researchers have also found that providing individuals with an autonomy supportive environment can help to increase learning in motor skills (Lewthwaite, Chiviawowsky, Drews, & Wulf, 2015), and encourage creativity in the workplace (Sia & Appu, 2015). Autonomy supportive environments satisfy the individual's psychological need to feel intrinsically motivated to pursue their goal; increasing their motivation as they feel it is something they want to do, instead of being restricted to pursue a goal due to external reasons (i.e., they have to do it; Ryan & Deci, 2006).

Perceived competence is the psychological need an individual has to feel good at what they do, that they will be successful in their goal pursuit (Deci & Ryan, 1985b). Niemiec and Ryan (2009) describe competence as the second aspect of intrinsic motivation towards a task, feeling that one is capable of accomplishing their task or goal allows the individual to find the task more enjoyable. Much like perceived autonomy, the psychological need for competence is not domain specific (Deci & Ryan, 2008). For instance, researchers have found that higher competence supportive environments that promote feelings of success at one's tasks are related to higher intrinsic motivation and course enjoyment in university students (Black & Deci, 2000) and improved intrinsic motivation at work (Vansteenkiste, Neyrinck, Niemiec, Soenens, De Witte, & Van den Broeck, 2010). Greater competence is also related to higher ability to avoid burnout in the workplace (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). Competence is also linked to relationships, wherein higher competence satisfaction is related to higher well-being for both the individual and the relationship (Patrick, Knee, Canevello, & Lonsbary, 2007).

The psychological need for relatedness stems from an individual's need to feel important to others (Deci & Ryan, 1985b). The psychological need for relatedness can be satisfied by

feeling accepted by peers or loved ones in a variety of different domains (Deci & Ryan, 2008). Fulfillment of the psychological need for relatedness is important to the well-being of relationships. For instance, relatedness has been shown to contribute to relational well-being during couple's leisure time above and beyond autonomy and competence (Huang, Cheng, & Change, 2019). Furthermore, Ilies, Lanaj, Pluut, & Goh (2018) suggest that increased relatedness supportive working environments that create feelings of social inclusion and importance can lead to improved workplace attitudes and behaviours. For example, workplace relatedness is linked to increased task performance when the team leader has provided a supportive environment to their subordinates (Chiniara, & Bentein, 2016). As well, people who reported greater psychological need fulfillment, especially relatedness, have greater well-being (Alcaraz, Torregrosa, & Viladrich; 2015).

Overall, satisfying psychological needs is related to improved well-being, and this relation has been demonstrated across cultures (i.e., United States, Australia, Mexico, Venezuela, the Philippines, Malaysia, China, and Japan; Church et al. 2012). However, whereas the fulfillment of psychological needs leads to well-being, the frustration of psychological needs can lead to ill-being (Deci & Ryan, 2002). Psychological need frustration occurs when psychological needs are not being satisfied due to a barrier within the individual's life that is actively thwarting their ability to fulfill their psychological needs (Vansteenkiste & Ryan, 2013). Since the inclusion of psychological need frustration within self-determination theory, it has been theorized that psychological need frustration can occur within any life goal that can allow an outside controlled barrier to impede the advancement of one's goals. For example, greater perceived psychological need frustration is associated with increased bullying due to teachers thwarting the needs of possible bullies (Hein, Koka, & Hagger, 2015), increased psychological

distress and psychosomatic complaints in nurses who feel their work needs are frustrated (Trépanier, Forest, Fernet, & Austin, 2015), and negative outcomes in interpersonal relationships (Costa, Ntoumanis, & Bartholomew, 2014). Psychological need frustration has also been linked to risky financial behaviours (Weinstein, & Stone, 2018) and disordered eating (Boone, Vansteenkiste, Soenens, Van der Kaap-Deeder, & Verstuyf, 2014; Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011).

The basic psychological needs have consistent relations across a range of domains (e.g., work, school, sports, interpersonal relationships), wherein higher need satisfaction relates to higher well-being. Extending these domains, researchers have begun to examine psychological needs in the technological domains. Wang, Tao, Fan, and Gao (2015) found video gaming to be linked to improved well-being when both online and daily life psychological needs are satisfied. This means that when the daily needs of an individual were satisfied in other life domains (work, relationships, school, etc...) and their needs were fulfilled within the context of video games, video gaming had a positive relation with their well-being. Researchers have found that video game enjoyment is linked to psychological need fulfillment of all three psychological needs depending on the characteristics and dimensions of the game (Oliver, Bowman, Woolley, Rogers, Sherrick, & Chung, 2016). Velez, Ewoldsen, Hanus, Song, and Villareal (2018) found that downward social comparison in video game leaderboards led to increased feelings of competence and relatedness. Playing video games with a group of individuals pursuing a common goal have led to increases in well-being when focusing on increased psychological need fulfillment (Reer, & Krämer, 2018).

Video gaming, however, is also related to ill-being with regards to how gaming may impact an individual's basic psychological needs (Weinstein, Przybylski, & Murayama, 2017).

Przybylski, Deci, Rigby, and Ryan (2014) found that when video games were competence impeding, individuals had increased aggressive feelings, thoughts, and self-reported greater likelihood of enacting aggressive behaviours, regardless of whether there was violent content within the game. Mills, Milyavskaya, Heath, and Derevensky (2017) found associations between daily life and video game psychological need frustration on the one hand and problematic video gaming behaviours on the other hand. Based on these findings, I propose that individuals who play video games and who have higher need frustration are more likely to engage in problematic video gaming behaviours relative to individuals who play video games and, who have lower need frustration.

Passion for gaming

Thus far, I proposed that people whose needs for autonomy, competence, and relatedness are frustrated are more likely to engage in problematic gaming behaviours. In this section I describe how obsessive passion (OP) for gaming may play a role in the development of problematic video gaming behaviours. Vallerand et al (2003) maintained this discussion by formally defining passion and theoretically anchoring it. According to Vallerand et al. (2003), passion is a strong motivational feeling towards a specific activity. Individuals who are passionate about an activity (e.g., gaming, work, sports) view the activity as important to them and thus spend time as well as both psychological and physical resources on the activity (Vallerand, 2008).

According to Vallerand (2015), there are seven aspects of an activity that lead the individual to develop a passion for it. First, the activity must be specific—an individual will not be passionate about everything in their life. Second, the specific activity must be desirable in that the individual must want to pursue the activity. Individuals will not desire the pursuit

activities that are thrust upon them by external circumstances. Third, the activity must be meaningful to the individual, it must be valued or else there will be no reason for the passion to pursue the venture to develop. The fourth aspect is defined as motivational—individuals must have the passion to seek out the activity, being agentic in their choice to pursue the activity. The fifth aspect of a passionate activity is defined by the way the activity becomes part of our self-identification. People will identify with their passionate venture. For example, people who are passionate about rock climbing will call themselves “climbers”, or people who are passionate about video games call themselves “gamers”. The sixth aspect of passion is persistence. Individuals who are passionate about an activity will not give up when facing barriers associated with their activity (e.g., a passionate writer will not give up due to a writer’s block). The seventh and final aspect defined by Vallerand (2015) is the dualistic properties associated with passionate pursuit; the outcomes of pursuing the activity can be positive (harmonious) or negative (obsessive) depending on how one identifies with activity.

According to Vallerand et al. (2003; see The Dualistic Model of Passion), passion is either adaptive (i.e., harmonious passion; HP) or maladaptive (i.e., obsessive passion; OP). HP occurs when the activity that one is passionate about is congruent with other aspects of their life. This leads to the passionate activity melding into the identity of the individual without disrupting the other aspects of their life (e.g., a person who starts an activity but does not let work, or social relations suffer as a result of their pursuit of the activity). In contrast, OP, does not fit into one’s identity quite as well as HP. This is because OP occurs when the activity of passion is not congruent with the rest of the individual’s life goals and identity (i.e., pursuing the activity interferes with success in other areas of life, such as work and social relations). The nature of the passion (HP or OP) is determined by how well the passionate activity interacts with other

domains of an individual's identity. For example, if someone developed a passion for video games, and incorporated video gaming into the time they spend with their family (e.g., family game night) this would be harmonious. However, if video gaming started to cause reduced time spent with their family to the point where their familial relations suffer, this would become obsessive. Curran, Hill, Appleton, Vallerand, and Standage (2015) suggested that it is this dualistic aspect that sets the theory of passion apart from other theories which share some of the theoretical foundations such as the intrinsic aspects shared by Self-Determination Theory (Ryan & Deci, 2000), behavioural constructs that relate to persistence such as over commitment (Preckel, von Känel, Kudielka, & Fischer, 2005), and state constructs that induce a strong desire for activity engagement such as flow (Csikszentmihalyi, 1975).

Research has been conducted on HP and OP passion in a variety of contexts. Vallerand et al. (2008), for instance, found that both HP and OP were positively associated with deliberate practice, leading to increased performance among athletes. However, HP was linked to increased performance through mastery and performance-approach goals, whereas OP was linked to increased performance through failure-avoidance goals. Thus, HP and OP both provided motivation for the athletes, but HP provided this motivation in an adaptive way, linking it to increased subjective well-being. Paradis, Cooke, Martin, and Hall (2014) also found that HP for exercise was related to increased competence and relatedness, but OP for exercise was negatively related to autonomy. The differences in outcomes between HP and OP has also been found for burnout in nurses (Vallerand, Paquet, Phillippe, & Charest, 2010); and athletes (Curran, Appleton, Hill, & Hall, 2011); obsessively passionate individuals burned out more often than those with a harmonious approach. Research supports that HP is linked to positive outcomes whereas OP has been linked to negative outcomes in domains such as player-coach relationships (Lafrenière,

Jowett, Vallerand, Donahue, & Lorimer 2008); affective experience in sport (Vallerand, Rousseau, Grouzet, & Dumais, 2006); and utilizing one's strengths at work (Forest et al. 2012). The positive relation between HP and well-being and the negative relation between OP and well-being has also been found across age groups (Mageau et al. 2009; Phillippe, Vallerand, & Lavigne, 2009).

Passion researchers have started to investigate the relation between HP, OP, and video gaming. Passion researchers have found similar results within the video gaming domain as other life domains such as school and work. In a sample of people who play massively multiplayer online role-playing games (MMOs), Stoeber, Harvey, Ward, and Childs (2011) found that HP for video games was positively related to well-being, whereas OP for video games was negatively related to well-being. Furthermore, OP was related to negative affect when they were prevented from playing (Stoeber et al., 2011). Likewise, Fuster, Chamarro, Carbonell, and Vallerand (2014) found that although both HP and OP online-gamers were playing for similar reasons, they had different experiences within the game. OP players were more likely to dissociate while playing the game whereas HP players were more interested in exploration of the world within the game. In sum, the extant research within video gaming supports the Dualistic Model of passion (see Vallerand et al., 2003). Lafrenière, Vallerand, Donahue, and Lavigne (2009) found that HP towards an activity is related to higher well-being and life satisfaction, whereas OP towards the same activity is related to lower well-being and life satisfaction. An OP towards gaming may be predictive of increases in the severity of problematic gaming behaviours.

The Current Research

In my thesis, I explore possible relations between problematic gaming behaviours, psychological needs frustration, and OP. I explore both a linear regression model and a

mediation model. The direct model (see Figure 1) involves regressing problematic video gaming simultaneously onto psychological needs frustration and obsessive passion. In contrast, the mediation model (see Figure 2) involves psychological needs frustration relating to problematic video gaming through OP. In the mediation model, I explore the idea that a risk factor for the development of problematic gaming comes from psychological needs frustration in one's daily life. Individuals who experience psychological need frustration may turn to video games as an escape from their daily lives into a world that does not have the same restrictions on their psychological needs thereby developing into an OP, which then leads to problematic behaviours. This model resembles escape models of behavioural addiction wherein people engage in addictive behaviours (e.g., gambling, substance use) to escape their psychological needs being frustrated by way of maladaptive coping (MacLaren, Fugelsang, Harrigan, & Dixon 2011; MacLaren, Ellery, & Knoll, 2015). Thus, the mediation model proposes that problematic gaming stems from psychological need frustrations in one's daily life explained via obsessive passion as a poor coping mechanism to escape these issues.

Figure 1. Direct model in which psychological needs frustration and obsessive passion independently predict problematic gaming behaviour.

Figure 2. Mediation model in psychological needs frustration predicts problematic gaming behaviour via obsessive passion.

Study 1: Pilot Data

As part of my prospectus, I first collected a large sample to assess the extent to which undergraduate students (my target sample) engage in video gaming. Another aim of Study 1 was to estimate the effect size of the indirect effect (see Figure 2). Doing so enabled me to estimate the minimum sample size needed to detect effects with at least 80% statistical power in Study 2. Thus, I describe below the method and results of Study 1 as well as the results of the power analysis.

Method

Participants. Undergraduate university students at Carleton University were recruited to participate via the SONA system. Participants were required to be at least 18 years of age. There were no other eligibility requirements for the study. Thus, 274 participants (202 women) were recruited with 22.8% of students not playing video games. This was established by asking participants if in the last 7-days they spent time “Playing video or computer games? Including games played on a game console, virtual reality headset, computer, or handheld electronic device such as a tablet or smart phone (Hours per week).” The mean hours of video games played per day was 1.86 ($SD = 2.25$).

Procedure. Undergraduate students enrolled in an introductory PSYC course were recruited from the Carleton SONA systems website. After reading about the purpose of the study and providing informed consent (see Appendix C), they completed the survey. The survey began with participants completing demographic questions (e.g., age, sex) followed by the questionnaires: *Psychological Needs Satisfaction and Needs Frustration Scale*, *Passion for Gaming Scale*, *Video Gaming Frequency Survey*, and the *Problem Gaming Severity Scale*. The questionnaires were completed in a random order by each participant to avoid order effects.

Once participants completed the questionnaires, they were debriefed about the goals of the study and provided further reading material. Participants were granted course credit as compensation.

Materials. All participants completed the following questionnaires (see Appendix C):

Psychological Need Satisfaction and Need Frustration. To measure basic psychological needs satisfaction and frustration I used the scale developed by Chen et al. (2015). The scale consists of 24 items and participants rated each item using a response scale with endpoints 1 (*completely untrue*) and 5 (*completely true*). Each basic psychological need (autonomy, competence, and relatedness) has 4 items for satisfaction and 4 items for frustration within the scale. These 4 items will then be averaged to obtain 6 different scores: autonomy-satisfaction, competence-satisfaction, relatedness-satisfaction, autonomy-frustration, competence-frustration, and relatedness frustration. Items include “I feel a sense of choice and freedom in the things I undertake”, and “I have the impression that people I spend time with dislike me.” Although only the psychological needs frustration subscales were analysed for this project, participants completed the entire scale for use in a larger research project. Chen et al. (2015) found the Cronbach’s alpha values for autonomy, competence, and relatedness measures of needs frustration were 0.71, 0.89, and 0.81, respectively, using a sample from the United States. Autonomy, competence, and relatedness measures for needs satisfaction had Cronbach’s alpha values of 0.81, 0.88, and 0.83, respectively, using a sample from the United States.

Passion for gaming. To measure harmonious and obsessive passion for gaming, I adapted the passion scale developed by Rousseau, Vallerand, Ratelle, Mageau, and Povencher (2002) that assessed passion towards gambling. The adapted scale consists of 14 items with 5 items (e.g., The new things that I am discovering with this video game allow me to appreciate it even more) for harmonious passion, 5 items (e.g., I couldn't live without this video game) for

obsessive passion, and 4 items for passion criteria which assesses how passionate an individual is about the activity (e.g., “Video games are a passion for me”). Participants responded to each item using a responses scale with endpoints 1 (*not at all agree*) and 7 (*very strongly agree*).

Although only the OP subscale was analysed in my thesis, participants completed the entire scale for use in a larger research project. Rousseau et al. (2002) found the Cronbach’s alphas for the original questionnaire for gambling had 0.9 at study 1 and a 0.84 test-retest correlation at study 2 for obsessive passion, and 0.76 at study 1 and a .89 test-retest correlation at study 2 for harmonious passion.

Video gaming frequency. I assessed the amount of time spent on video games by asking participants how much of their free time is spent on the activity. Items included asking total hours spent playing games, the type of game being played from a list of 6 (e.g., first-person shooter, massive multiplayer online role-playing game, other, etc.), how serious of a gamer they consider them self to be, and finally how many hours the participant believes a light, moderate, and heavy gamer spends playing video games each week. All responses were open-ended.

Problem gaming severity. Problematic gaming severity was measured using the Gaming Addiction Scale developed by Lemmens et al. (2009). The scale consists of 21 items wherein each item is rated on response scale with endpoints 1 (*never*) and 5 (*very often*). The scale has 7 subscales: salience (e.g., “Did you think about playing a game all day long?”), tolerance (e.g., “Did you spend increasing amounts of time on games?”), mood modification (e.g., “Did you play games to forget about real life?”), relapse (e.g., “Have others unsuccessfully tried to reduce your game use?”), withdrawal (e.g., “Have you felt bad when you were unable to play?”), conflict (e.g., “Did you have fights with others (e.g., family, friends) over your time spent on games?”), and problems (e.g., “Have you neglected other important activities (e.g., school, work, sports) to

play games?”). Responses to all items were averaged to calculate a composite score of problematic gaming severity. Lemmons et al. (2009) reported Cronbach’s alpha values of .94 and .92 across 2 samples.

Results

Descriptive analyses. The total sample size was 274. Of the 274 participants, 210 indicated they regularly played video games (hours per day: $M = 2.41$, $SD = 2.29$). Thus, all analyses involved only participants who played video games ($n = 210$). Descriptive statistics and correlations between all variables are reported in Table 1. In short, psychological need frustration and obsessive passion were each positively associated with problem gaming severity. In contrast, psychological need frustration and obsessive passion were unrelated (see Table 1).

Power analysis. To determine sample size for Study 2, I used the correlations from Study 1 (see Table 1) as input in the power analysis. The power analysis involved a Monte Carlo simulation using Schoemann’s (2016) power analysis Shiny application tool. I simulated the mediation model 10,000 times to obtain the needed sample for 80% power with an alpha of .05 for the indirect effect. The indirect effect was tested using a 95% bias-corrected bootstrapped confidence interval (with 5000 resamples). Results indicated that at least 540 participants would be needed to explore the mediation model.

Direct model. A linear regression analysis was conducted to explore the unique associations between needs frustration and OP on the one hand and problematic video gaming severity on the other hand. The direct model accounted for 44% of the variance in problematic gaming behaviours, $F(2, 206) = 80.77$, $p < .001$. Both psychological needs frustration $B = 0.1$, $\beta = .11$, $t = 2.10$, $p = .04$, 95% CI [0.01, 0.21] and OP $B = 0.46$, $\beta = .64$, $t = 12.21$, $p < .001$, 95% CI [0.39, .53] were statistically significant predictors of problematic gaming behaviours. As

individuals had higher psychological needs frustration and OP for gaming their problematic gaming behaviours increased.

Mediation model. The mediation model accounted for 44% of the variance in problematic gaming severity, $F(2, 206) = 80.77, p < .001$. The direct effect of psychological needs on problematic gaming severity was statistically significant, $B = 0.11, t = 2.10, p = .04$. The direct effect of OP on problematic gaming severity was also statistically significant $B = 0.46, t = 12.21, p < .001$. The indirect effect of psychological needs frustration through OP was not statistically significant $B = 0.07$, bootstrapped 95% CI $[-0.01, 0.16]$, and $\beta = .07$ was not statistically significant.

Table 1

Correlations and Descriptive Statistics in Study 1

Variable	1	2	3	<i>M</i>	<i>SD</i>
1. Psychological Need Frustration	—	.12	.18*	2.39	.74
2. Obsessive Passion		—	.66*	1.71	1.00
3. Problem gaming severity			—	1.98	.72

Note. * $p < .05$
n = 210

Study 2

The methodology used in Study 2 was identical to that used in Study 1 except that an eligibility criterion was that participants had to self identify as gamers. Because there is not an established definition of “gamer” in the literature, we asked participants to respond to a single item: “Do you consider yourself to be a gamer (PC, consoles, mobile games, etc..)?”

As well, based on recommendations stemming from my prospectus defense, I included the *MacArthur scale of subjective social status* (SSS Scale; Adler, Epel, Castellazzo, and

Ickovics, 2000). The SSS questionnaire is a single item scale that assesses an individual's perceived socio-economic status (SES) within their society using a 10-rung ladder. In the instructions, participants were told that the bottom of the ladder represents individuals whom are the lowest in society (i.e., a low respected or no job, little education, etc..) whereas the top of the ladder represents individuals whom are highest in society (i.e., high paying job, high level of education, etc..). Participants were asked to "...place an 'X' on the rung that best represents where you think you stand on the ladder." I included SSS in Study 2 because people who perceive greater needs frustration may also have lower SES. SES has also been linked to a variety of mental health disorders including addiction (Miech, Caspi, Moffitt, Wright, & Silva, 1999), and therefore may relate to problematic gaming behaviours. Thus, to rule out participants' SES as a potential confounding factor, I included SSS as a covariate in the analyses for the direct model and the mediation model.

Method

Participants. Undergraduate Carleton University students enrolled in introductory psychology courses were recruited online through the Carleton SONA system to complete a questionnaire battery. There was an initial total of 663 participants, however, 395 participants were excluded. More specifically, 236 participants were excluded because they responded "No" to the initial question of whether or not they consider themselves to be a gamer. Another 32 participants were excluded because they indicated at the end of the survey that they did not answer the survey questions honestly. As such, a total of 395 participants were included in the analyses. Participants' age ranged from 17 to 53 years ($M = 20.98$, $SD = 4.22$). Unlike the pilot study, the gender of the participants was almost evenly split with 193 (48.3%) participants within the sample being male, (204) (51%) being female, 2 (.5%) preferring not to answer. We also

asked how intense of a gamer individual's believed themselves to be; asking them whether they were a light, moderate, or heavy gamer. We did not define these response categories to the participants as we wanted to gain information about what the participants believe a light, moderate, and heavy gamer are. Two-hundred and ten (52.5%) of the participants rated themselves as light, 153 (38.3%) as moderate, and 33 (8.3%) as heavy gamers. Forty-four point five percent our sample identified as Caucasian, 15% as Chinese, 12.75% as Black, 9.75% as South Asian, and the remaining 18% as varying other ethnicities or other.

Results

Descriptive analyses. The correlations between psychological needs frustration (Cronbach's $\alpha = .91$), OP (Cronbach's $\alpha = .90$), SSS, and problem gaming severity (Cronbach's $\alpha = .93$) are reported in Table 2. As in Study 1, problem gaming severity was positively correlated with both psychological needs frustration and obsessive passion. However, in contrast to Study 1, psychological needs frustration and OP were positively correlated in Study 2. Interestingly, SSS was negatively correlated with needs frustration and was not correlated with any other measured variable in Study 2 (see Table 2).

Table 2.

Descriptive Statistics and Correlations for Psychological Needs Frustration, Obsessive Passion, SES, and Problem Gaming Severity

Variable	1	2	3	4	<i>M</i>	<i>SD</i>
1. Psychological needs frustration	-	.42**	.39**	-.13**	2.58	.83
2. Obsessive Passion		-	.68**	-.08	2.43	1.35
3. Problem gaming severity			-	-.01	2.48	.73
4. SSS				-	6.19	1.48

Note. SSS = subjective social status.

** $p < .01$

N = 395.

Direct model. As in Study 1, a linear regression analysis was conducted to explore the unique associations between needs frustration and OP on the one hand and problematic video gaming severity on the other hand. The linear regression resulted in psychological needs frustration and OP collectively accounting for 47.4% of the variance in problematic gaming severity, $F(3, 386) = 116.17, p < .001$, which is a large effect. The magnitude of the relation between psychological needs frustration problem gaming severity was small, $B = 2.42, \beta = .13, t = 3.23, p = .001, 95\% \text{ CI } [0.95, 3.89]$. In contrast, the magnitude of the relation between OP and problem gaming severity was large, $B = 7.09, \beta = .63, t = 15.42, p < .001, 95\% \text{ CI } [6.18, 7.98]$. The relation between SSS and problematic gaming severity was not statistically significant, $B = 0.53, \beta = .05, t = 1.37, p = .17, 95\% \text{ CI } [-0.23, 1.28]$.

Mediation model. The unstandardized regression coefficients from the mediation model are reported in Figure 3. The mediation model explained 47% of the variance in problematic gaming severity, $F(386, 3) = 116.17, p < .001$. The relation between psychological needs frustration and problematic gaming severity was statistically significant, $B = 2.42, t = 3.23, p = .001, 95\% \text{ CI } [0.94, 3.89]$. The relation between OP and problematic gaming severity was statistically significant, $B = 7.08, t = 15.42, p < .001, 95\% \text{ CI } [6.18, 7.98]$. The indirect effect of psychological needs frustration on problem gaming severity via OP was statistically significant, $B = 4.76$, bootstrapped 95% CI $[3.45, 6.2]$, and $\beta = .26$ was statistically significant. Lastly, SSS was not related to problematic gaming severity, $B = .52, t = 1.37, p = .17, 95\% \text{ CI } [-0.23, 1.28]$.

Figure 3. Outcome of the mediation analysis for Model B with SES as covariate. ** $p < .01$, *** $p < .001$.

Discussion

Across Studies 1 and 2, I explored the relation between psychological needs frustration and OP with problematic gaming severity. I found that psychological needs frustration and obsessive passion were both uniquely and positively correlated, with problematic gaming. In Study 1, all students were eligible to participate. With this sample, I observed that the magnitude of the positive association between psychological needs frustration and problem gaming severity was small whereas the positive association between OP and problem gaming severity was large. There was also no correlation between psychological needs frustration and OP. These associations suggest that psychological needs frustrations is largely independent of OP and may not play an influential role in problematic gaming. One explanation for these results is that the sample of participants in Study 1 did not involve people who were psychologically invested in gaming.

As such, in Study 2, I recruited students who self-identified as being a “gamer.” With this sample, I replicated the positive associations between psychological needs frustration and OP on the one hand and problematic gaming behaviours on the other hand. As well, in contrast to Study 1, psychological needs frustration was moderately and positively associated with problematic gaming behaviour. As well, psychological needs frustration and OP were moderately and positively correlates. These results suggest that psychological needs frustration and OP may be important for understanding problematic gaming behaviours among people who identify as being a gamer.

I also examined whether there was an indirect relation between psychological needs frustration and problem gaming via obsessive passion. In Study 1, I did not find a statistically significant relation. Again, this is likely because the nature of the sample was broad in terms of

eligibility criteria, which may have made it more difficult to detect an indirect effect. However, in Study 2, a larger sample was recruited that included only people who identify as a gamer. With this sample, I found evidence for an indirect relation between psychological needs frustration and problem gaming via OP. Together, the results provide insight into the possibility that problem gaming may stem from other aspects of an individuals' life, and not simply from overindulgence in gaming. As such, results provide a foothold into the factors that may contribute to the development of problem gaming.

The results are also consistent with prior research on problem gaming. In particular, Mills et al. (2018) reported an association between needs frustration and problematic gaming. They found that autonomy, competence, and relatedness needs frustration were positively related to problematic video gaming. The magnitude of these associations were moderate and so were inconsistent with the small associations observed in Studies 1 and 2. One reason for the inconsistency may be the nature of the samples. More specifically, Mills and colleagues (2018) recruited a community sample of adults aged between 18 and 35 years old from social network sites (e.g., Facebook, Reddit), research forums, email invitations, and flyers. In the current research, I recruited only from a participant pool of undergraduate university students. Thus, although the current research replicates associations found in prior research, the associations reported herein were smaller.

The results are also consistent with research on other addictive behaviours. In particular, OP has been shown to be associated with problematic gambling (Ratelle, Vallerand, Mageau, Rousseau, & Povencher, 2004; Skitch & Hodgins, 2005). Ratelle and colleagues (2004) showed that OP was positively and strongly associated with problematic gambling in a sample of older adults. Likewise, Skitch and Hodgins (2005) showed that OP was positively and strongly

associated with problematic gambling in a comparable sample of undergraduate students recruited from the University of Calgary's Psychology department participant pool who gambled a minimum of twice monthly. Together, the magnitude of the association between OP and problematic gambling in prior research was positive and large, which is similar to the association between OP and problem gaming in the current research.

In sum, the current research contributes to a small, but growing, body of research examining psychological needs frustration and OP in behavioural addictions.

Limitations and future directions

There are some limitations of the current research that should be noted. The research design in Studies 1 and 2 were cross-sectional. As such, it is impossible to make causal inferences about relations between psychological needs frustration, OP and problem gaming. As such, it is possible that a different causal sequence in the mediation model is possible. For instance, OP may influence problematic gaming behaviours through greater needs frustration. Another possibility is that OP influences needs frustration through problematic gaming behaviour. Nevertheless, the main purpose of the research was to explore associations, and therefore the analyses were conducted with the intent to gain insight into how need frustration, OP, and problematic gaming may be related. Thus, an important direction for future research is to examine whether psychological needs frustration and OP are related to the development of problem gaming amongst gamers over time.

Second, the sample size in Study 2, although much larger than the sample size in Study 1, did not meet the sample size determined from the power analysis. As such, it is possible that the associations observed in Study 2 may be inaccurate. That said, the effects observed in Study 2 were larger than those in Study 1 and so having less participants than indicated by the power

analysis may not have had a major impact on Type II error. However, research moving forward should make a conservative estimate of the effect size when assessing sample size requirements in power analyses.

Third, although we explored what the mediation model implies; individuals whom are frustrated in their daily lives due to need thwarting, will turn to video games as an escape. Playing video games in order to escape unfulfilled needs may lead to problematic gaming behaviours. The problematic gaming behaviours may then lead to harm in other aspects of an individual's life. The idea of using video games as an escape from daily needs frustration developing into an obsessive passion that leads to problematic gaming behaviours is the theory behind the models explored in the current study. However, the current study did not meet the methodological rigor required to test the mediation model. Therefore, future studies should take a more rigorous approach to examine why individuals with high need frustration have higher obsessive passion, or higher rates of problematic behaviours.

Conclusion

The purpose of the current research was to explore the associations between daily psychological needs frustration, obsessive passion for gaming, and problematic gaming severity. I found evidence for the idea that people who identify as gamers and who perceive more psychological needs frustration for competence, relatedness, and autonomy in their daily lives are more likely to have problematic gaming behaviours. Gamers are also more likely to have problematic behaviours the more they have an obsessive passion for gaming. Together, these findings extend our understanding of the factors that may play a role in pathways to problem gaming.

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Appendix A: Pilot Study Ethics Clearance Certificate

Office of Research Ethics
5110 Human Computer Interaction Bldg | 1125 Colonel By Drive
| Ottawa, Ontario K1S 5B6
613-520-2600 Ext: 4085
ethics@carleton.ca

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-B (CUREB-B) has granted ethics clearance for the research project described below and research may now proceed. CUREB-B is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

Ethics Protocol Clearance ID: Project # 108889

Research Team: Mr. Jonathan Capaldi (Primary Investigator)
Dr. Katie Gunnell (Research Supervisor)

Project Title: Video gaming behaviours and psychological health [Katie Gunnell]

Funding Source (If applicable):

Effective: May 22, 2018

Expires: May 31, 2019.

Please ensure the study clearance number is prominently placed in all recruitment and consent materials: CUREB-B Clearance # 108889.

Restrictions:

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
3. An Annual Status Report for the renewal of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.
4. A closure request must be sent to CUREB-B when the research is complete or terminated.
5. Should any participant suffer adversely from their participation in the project you are required to report the matter to CUREB-B.

Failure to conduct the research in accordance with the principles of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd edition* and the *Carleton University Policies and Procedures for the Ethical Conduct of Research* may result in the suspension or termination of the research project.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

Please contact the Research Compliance Coordinators, at ethics@carleton.ca, if you have any questions.

CLEARED BY:

Date: May 22, 2018

Andy Adler, PhD, Chair, CUREB-B

Bernadette Campbell, PhD, Vice-Chair, CUREB-B

Appendix B: Change to Ethics Clearance Certificate

Office of Research Ethics
503 Robertson Hall | 1125 Colonel By Drive
Ottawa, Ontario K1S 5B6
613-520-2600 Ext: 4085
ethics@carleton.ca

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-B (CUREB-B) has granted ethics clearance for the changes to protocol to research project described below and research may now proceed. CUREB-B is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

Ethics Clearance ID: Project # 108889

Principal Investigator: Mr. Jonathan Capaldi

Co-Investigator(s) (If applicable): Mr. Jonathan Capaldi (Primary Investigator)
Nassim Tabri (Co-Investigator)
Dr. Katie Gunnell (Research Supervisor)

Project Title: Video gaming behaviours and psychological health [Katie Gunnell]

Funding Source:

Effective: March 26, 2019

Expires: May 31, 2019.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

During the course of the study, if you encounter an adverse event, material incidental finding, protocol deviation or other unanticipated problem, you must complete and submit a Report of Adverse Events and Unanticipated Problems Form, found here: <https://carleton.ca/researchethics/forms-and-templates/>

Please email the Research Compliance Coordinators at ethics@carleton.ca if you have any questions.

CLEARED BY:

Date: March 26, 2019

Bernadette Campbell, PhD, Chair, CUREB-B

Natasha Artemeva, PhD, Vice Chair, CUREB-B

Appendix C: Study Materials

Informed Consent

Questionnaire/Survey Online Consent Form

Name and Contact Information of Researcher:

Dr. Nassim Tabri (Principal Investigator). Email; nassimtabri@cunet.carleton.ca, phone: 613-520-2600 ext. 1727.

Jonathan Capaldi (Master's Student; Email: jonathan.capaldi@carleton.ca)

Project Title: Video game views and behaviours.

Carleton University Project Clearance:

Clearance #108889

Date of Clearance:

Invitation: You are invited to take part in a research project because you are a students in PSYC 1001, 1002, 2001, or 2002. Able to read and understand English and must at least 18 years of age. Participants are also limited to those whom partake in a minimum of 5 hours of video game activity per week. The information in this form is intended to help you understand what we are asking of you so that you can decide whether you agree to participate in this study. Your participation in this study is voluntary, and a decision not to participate will not be used against you in any way. As you read this form, and decide whether to participate, please ask all the questions you might have, take whatever time you need, and consult with others as you wish.

What is the Purpose of this study? Video game use in on the rise. Our research will look at possible outcomes such as video gaming addiction, or beneficial effects of well-being due to video game use. We will be examining what factors may influence these outcomes.

What will I be asked to do? This study will examine your views and behaviours regarding video games, as well as your general psychological health. You will be asked to complete a questionnaire containing questions about your demographics (e.g., age, ethnicity, year of study, etc.). You will then be asked about your gaming behaviours (e.g., do you play them? If so, how often? etc.), your views on video games, and a questionnaire asking about possible problematic behaviours relating to gaming.

The Questionnaires will then ask you about your well-being, including general life-satisfaction, question about your psychological needs (general satisfaction, and frustration), such as your feelings of competency, autonomy, and relatedness. You will also be asked about symptoms of anxiety and depression.

With this research, we hope to learn how gaming relates to psychological health as well as how individuals differ in their views of gaming in relation gaming behaviour.

Risks and inconveniences: There will be no more physical risk than is consistent with sitting in front of a computer for a one-hour period. Participants may take breaks if they wish. Participants may feel uncomfortable answering questions on the survey. While these surveys do involve some emotional risks, you have the right to refuse to answer any of the questions without penalty. If participants become upset during or after participation, they can contact someone at the following numbers:

- Mental Health Crisis Line:
 - Within Ottawa (613) 722-6914
 - Outside Ottawa 1-866-996-0991, Web Site: <http://www.crisisline.ca/>
- Ottawa Distress Centre: (613) 238 1089, Web Site: www.dcottawa.on.ca
- Carleton University Health Services 613 520 6674

Possible benefits: You may not receive any direct benefit from your participation in this study. However, your participation may allow researchers to better understand how video games affect psychological well-being.

Compensation: You will receive 0.25% marks towards your course (PSYC 1001, 1002, 2001, or 2002) for the completion of this study.

No waiver of your rights: By signing this form, you are not waiving any rights or releasing the researchers from any liability.

Withdrawing from the study: You have the right to end your participation in the survey at any time, for any reason. We cannot remove any data that has been provided but it is all completely unidentifiable.

Duration and Locale: 20-30 minutes online (through SONA and Qualtrics).

Confidentiality: We collect data through the software Qualtrics, which uses Canadian servers with multiple layers of security to protect the privacy of the data (e.g., encrypted websites and password-protected storage). Because you will be granted course credit for taking part in the study, identifying information will be retained using a code until the course credit is granted. Only after removal of ALL identifying information the data will be uploaded to the Open Science Framework website and will be able to be accessed by other researchers within the community.

Data Retention: After the study is completed, your de-identified data will be retained for future research use.

Study Results: If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy, which will be provided to you.

New information during the study: In the event that any changes could affect your decision to continue participating in this study, you will be promptly informed.

CUREB-B

This project was reviewed and cleared by the Carleton University Research Ethics Board B. If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board (by phone at 613-520-2600 ext. 4085 or by email at ethics@carleton.ca).

Please allow 7 days to receive SONA credit.

By clicking “submit”, you consent to participate in the research study as described above.

Debriefing

What are we trying to learn in this research?

This study examines video gaming behaviours and psychological health in undergraduate students. The questionnaires you completed assessed basic background information about you (e.g., age, gender, etc...). We also asked about your video game behaviours (i.e., how often do you play games?), and how you view video gaming (i.e., asking about what you consider a light gamer, etc...). Symptoms of depression and anxiety were also measured. Lastly, motivational factors were measured by looking at psychological needs satisfaction and frustration for feelings of competence, autonomy, and relatedness. We are interested in the frequency of gaming within the Carleton Undergraduate community, as well as exploring if and how video gaming behaviours are related to different indicators of psychological health, addictive gaming habits (do they impede on daily life?), if motivational factors buffer these relationships, and if we can accurately measure these factors. We may also examine if these relationships are related to basic background information about you (e.g., your age, ethnicity, etc...).

Why is this important to scientists or the general public?

Recently, researchers are trying to understand how screen behaviours (i.e., playing video games) affect various things such as motivation and psychological health. Little is currently known about the relation between video gaming habits, motivation and psychological health. We are hoping to gain more information about these questions. Through the findings of this study, we anticipate being able to make recommendations on how to identify good habits vs. bad habits of gaming engagement and how it might impact psychological health.

What are our hypotheses and predictions?

Much of the research at this stage is exploratory (we don't have much information to make strong predictions). We are conducting this research to explore the relations between video games, psychological health, and motivation. From this, we do expect to find that there are conditions under which video gaming behaviours are beneficial to psychological health, and conditions under which video gaming behaviours can be problematic and negative to psychological health. We are also exploring if there will be differences in how gamers and non-gamers view gaming behaviours.

Where can I learn more?

For more information on the relationships between gaming behaviours and psychological health, see the following resources:

Rigby, S. C., & Ryan, R. M. (2016). Time well spent? Motivation for entertainment media and its eudaimonic aspects through the lens of self-determination theory. *The Routledge handbook of media use and well-being: International perspective on theory and research on positive media effects*. L. Reinecke, M. B. Oliver (Ed.) New York, NY: Taylor & Francis.

Przybylski, A. K., Weinstein, N. and Murayama, K. (2017) Internet gaming disorder: Investigating the clinical relevance of a new phenomenon., *Am J Psychiatry*. 174, 230-236.

Is there anything I can do if I found this experiment to be emotionally upsetting?

Depression is a condition that can occur for many reasons, including workplace, school, or relationship stressors, traumatic life events, discrimination, as well as physical/biological imbalances. Approximately 10-15% of people will suffer some degree of depression during their lifetime. With advances in modern medicine, most people can readily be treated for this illness, which if unattended can be long lasting and affect many aspects of one's life.

The symptoms of depression include:

- Poor or depressed mood, or a reduction in the pleasure gained from otherwise positive experiences
- Sleep disturbances
- Eating disturbances (loss of appetite, or overeating despite not being hungry), which may be linked to weight changes
- Lack of sexual interest
- Fatigue and lethargy (you don't feel like doing anything)
- An inability to focus (e.g., you have a hard time reading)
- Reduced interactions with family and friends
- Thoughts of suicide

Someone who is depressed may experience several (3-4), but not necessarily all of the above symptoms. It is likewise the case that 60% of individuals will encounter a severe traumatic event in their lives and of these people, a fair number will develop symptoms that cause severe anxiety. Illnesses of this nature, including posttraumatic stress disorder (PTSD) can be treated. Once again, if unattended, the repercussions can be severe.

Symptoms include:

- Hyperarousal (e.g., feelings of anxiety and reactivity even to minor situations)
- Intrusive thoughts (memories of the event come into your head frequently)
- Avoiding thoughts or stimuli related to the event

These symptoms can persist for more than a month following the event, and influence your day-to-day functioning.

If you are not already receiving help for this problem, it is suggested that you contact your family physician. It is not a good idea to allow problems to fester, as ruminating over these problems will typically not make them go away. Your family physician or counsellor will usually be able

to help you or to refer you to someone who can. If you do not have a family physician, then you can contact either of the following:

- Mental Health Crisis Line:
 - within Ottawa (613) 722-6914
 - outside Ottawa 1-866-996-0991, Web Site: <http://www.crisisline.ca/>
- Ottawa Distress Centre: (613) 238 1089, Web Site: www.dcottawa.on.ca
- Carleton University Health Services 613 520 6674

What if I have questions later?

If you have any remaining concerns, questions, or comments about the study, please feel free to contact Katie Gunnell (Principal Investigator; Katie.gunnell@carleton.ca; 613-520-2600 x2419; student researchers; Jonathan Capaldi jonathan.capaldi@carleton.ca.

CUREB-B:

This project was reviewed and cleared by the Carleton University Research Ethics Board B. If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board (by phone at 613-520-2600 ext. 4085 or by email at ethics@carleton.ca).

Thank you for participating in this research!

This research was cleared by Carleton University Research Board B Clearance #108889.

SONA Recruitment Notice

Study Name: Video game view and behaviours.

Description: This study asks students enrolled in classes at Carleton University to fill out surveys online relating to their views and behaviours related to video games. We are also measuring well-being (life satisfaction, anxiety, depression), and psychological needs (competence, autonomy, and relatedness).

Eligibility Requirements: Students in PSYC 1001, 1002, 2001, or 2002. Able to read and understand English, and must be at least 18 years of age. Must currently play video games of some kind (PC, Console, Phone, etc...).

Risks: There will be no more physical risk than is consistent with sitting in front of a computer for a 30 minute period. Participants may take breaks if they wish. Participants may feel uncomfortable answering questions on the survey. While these surveys do involve some emotional risks, you have the right to refuse to answer any of the questions without penalty. If participants become upset during or after participation, they can contact someone at the following locations:

- Mental Health Crisis Line:
 - Within Ottawa (613) 722-6914
 - Outside Ottawa 1-866-996-0991, Web Site: <http://www.crisisline.ca/>
- Ottawa Distress Centre: (613) 238 1089, Web Site: www.dcottawa.on.ca
- Carleton University Health Services 613 520 6674

Duration and Locale: 20-30 minutes online (through SONA and Qualtrics) at one point in time.

Compensation: You will receive 0.25% towards your course (PSYC 1001, 1002, 2001, or 2002) for completion of the study.

Researchers: Dr. Katie Gunnell (Principal Investigator); Email; katie.gunnell@carleton.ca, phone: 613-520-2600 ext. 2419. Dr. Nassim Tabri (Co-Investigator); nassim.tabri@carleton.ca, phone; 613-520-2600 ext. 1727. Jonathan Capaldi (Master's Student); Email: jonathan.capaldi@carleton.ca

This study has received clearance by the Carleton University Research Ethics Board B (Clearance # 108889).

CUREB-B:

If you have any ethical concerns with the study, please contact Dr. Andy Adler, Chair, Carleton University Research Ethics Board-B (by phone at 613-520-2600 ext. 4085 or via email at ethics@carleton.ca).

Demographics

We would like to find out a little bit about you. Please answer the question below so we can learn more about you. There is no right or wrong answers to these questions and you can skip any question you feel uncomfortable answering!

1. Are you a student at Carleton University?

- ☐ Yes
- ☐ No

2. Are you able to read and understand English?

- ☐ Yes
- ☐ No

3. How old are you? _____ years old

4. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify): _____
- ☐ Prefer not to answer

5. Do you belong to any of the population groups listed below?

- ☐ White
- ☐ Chinese
- ☐ South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)
- ☐ Black
- ☐ Filipino
- ☐ Latin American
- ☐ Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai, etc.)
- ☐ Arab
- ☐ West Asian (e.g., Iranian, Afghan, etc.)
- ☐ Korean
- ☐ Japanese
- ☐ Not sure

Other (please specify) _____

Video Games

In the last **7-days (week)**, how much of your **free time** did you spend doing the following (Enter time in hours to the nearest half hour):

1. Playing video or computer games? Include games played on a game console, virtual reality headset, computer, or hand held electronic device such as a tablet or smart phone
_____ (hours)
2. Playing each of the following types of game:
 - First-Person Shooter (FPS) _____ (hours)
 - Massive Multiplayer Online Role-Playing Game (MMORPG) _____ (hours)
 - Multiplayer Online Battle Arena (MOBA) _____ (hours)
 - Real-Time Strategy (RTS) _____ (hours)
 - Single-Player _____ (hours)
 - Other _____ (hours)
3. Would you consider yourself to be:
 - a) Not a gamer
 - b) A Light gamer
 - c) A Moderate gamer
 - d) A Heavy gamer
4. How many hours do you think the average gamer plays for each of the categories below?
 - Light gamer _____ (hours)
 - Moderate gamer _____ (hours)
 - Heavy gamer _____ (hours)

SES Ladder Scale

Think of this ladder as representing where people stand in Canada.

At the **top(10)** of the ladder are the people who are the best off – those who have the most money, the most education and the most respected jobs. At the **bottom(1)** are the people who are the worst off – who have the least of money, least education and the least respected job or no job. The higher up you are on this ladder, the closer you are to the very top; the lower you are, the closer you are to the very bottom.

Where would you place yourself on this ladder?

Please indicate which rung using the drop down menu below from 1 (bottom rung) to 10 (top rung) where you think you stand at this time in your life, relative to other people in Canada.

Psychological Need Satisfaction and Frustration Scale

Recall that you can skip any question you feel uncomfortable answering.

Below, we are going to ask about your actual experiences of certain feelings in your life. Please read each of the following items carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you at this point in your life.

	Completely untrue				Completely true
1. I feel a sense of choice and freedom in the things I undertake	1	2	3	4	5
2. I feel that my decisions reflect what I really want	1	2	3	4	5
3. I feel my choices express who I really am	1	2	3	4	5
4. I feel I have been doing what really interests me	1	2	3	4	5
5. Most of the things I do feel like "I have to"	1	2	3	4	5
6. I feel forced to do many things I wouldn't choose to do	1	2	3	4	5
7. I feel pressured to do too many things	1	2	3	4	5
8. My daily activities feel like a chain of obligations	1	2	3	4	5
9. I feel that the people I care about also care about me	1	2	3	4	5
10. I feel connected with people who care for me, and for whom I care	1	2	3	4	5
11. I feel close and connected with other people who are important to me	1	2	3	4	5
12. I experience a warm feeling with the people I spend time with	1	2	3	4	5
13. I feel excluded from the group I want to belong to	1	2	3	4	5

14. I feel that people who are important to me are cold and distant towards me	1	2	3	4	5
15. I have the impression that people I spend time with dislike me	1	2	3	4	5
16. I feel the relationships I have are just superficial	1	2	3	4	5
17. I feel confident that I can do things well	1	2	3	4	5
18. I feel capable at what I do	1	2	3	4	5
19. I feel competent to achieve my goals	1	2	3	4	5
20. I feel I can successfully complete difficult tasks	1	2	3	4	5
21. I have serious doubts about whether I can do things well	1	2	3	4	5
22. I feel disappointed with many of my performance	1	2	3	4	5
23. I feel insecure about my abilities	1	2	3	4	5
24. I feel like a failure because of the mistakes I make	1	2	3	4	5

Gaming Addiction Scale

Recall that you can skip any question you feel uncomfortable answering.

The next set of question will ask you about your gaming behaviours.

How often during the last 6 months...

	Never	Rarely	Sometimes	Often	Very Often
1. Did you think about playing a game all day long?*	1	2	3	4	5
2. Did you spend much free time on games?	1	2	3	4	5
3. Have you felt addicted to a game?	1	2	3	4	5
4. Did you play longer than intended?	1	2	3	4	5
5. Did you spend increasing amounts of time on games?*	1	2	3	4	5
6. Were you unable to stop once you started playing?	1	2	3	4	5
7. Did you play games to forget about real life?*	1	2	3	4	5
8. Have you played games to release stress?	1	2	3	4	5
9. Have you played games to feel better?	1	2	3	4	5
10. Were you unable to reduce your game time?	1	2	3	4	5
11. Have others unsuccessfully tried to reduce your game use?*	1	2	3	4	5
12. Have you failed when trying to reduce game time?	1	2	3	4	5
13. Have you felt bad when you were unable to play?*	1	2	3	4	5
14. Have you become angry when unable to play?	1	2	3	4	5
15. Have you become stressed when unable to play?	1	2	3	4	5
16. Did you have fights with others (e.g., family, friends)	1	2	3	4	5

over your time spent on games?*					
17. Have you neglected others (e.g., family, friends) because you were playing games?	1	2	3	4	5
18. Have you lied about time spent on games?	1	2	3	4	5
19. Has your time on games caused sleep deprivation?	1	2	3	4	5
20. Have you neglected other important activities (e.g., school, work, sports) to play games?*	1	2	3	4	5
21. Did you feel bad after playing for a long time?	1	2	3	4	5

Attention Check

Example checking questions to ensure participants are paying attention (will be distributed throughout the above questionnaires)

1. Please select 1 for this response (to be inserted in Likert type surveys)
2. Did you read all questions and answer them honestly (to be inserted as the very last question of the survey)