World Journal of Social Science Research
ISSN 2375-9747 (Print) ISSN 2332-5534 (Online)
Vol. 6, No. 1, 2019
www.scholink.org/ojs/index.php/wjssr

Original Paper

Negative Affect, Life Satisfaction, and Internet Gaming Disorder: Exploring the Mediating Effect of Coping and the Moderating Effect of Passion

Devin J. Mills[1*], Wen Li[2] & Loredana Marchica[3]

[1] Center for Gambling Studies, Rutgers University, New Jersey, USA

[2] School of Social Work, Rutgers University, New Jersey, USA

[3] Department of Educational and Counseling Psychology, McGill University, Montreal, Quebec, Canada

[*] Devin J. Mills, Center for Gambling Studies, Rutgers University, New Jersey, USA

Received: December 22, 2018 Accepted: January 11, 2019 Online Published: January 22, 2019

doi:10.22158/wjssr.v6n1p45 URL: http://dx.doi.org/10.22158/wjssr.v6n1p45

Abstract

No research has examined whether the effect of high negative affect and poor life satisfaction on Internet Gaming Disorder (IGD) is explained by gaming to cope or is dependent upon users' passion for video gaming. An online sample of adults (N = 969 adults; 60.5% male) reported their passion for video games, positive and negative affect, life satisfaction, and IGD severity. A latent profile analysis on the passion subscales yielded four subgroups: (1) minimally passionate; (2) moderately passionate; (3) harmoniously passionate (HP); and (4) Obsessively Passionate (OP) video game users. Although negative affect was directly and indirectly associated with greater IGD through gaming to cope in the overall sample, a follow-up moderated-mediation model revealed that gaming to cope did not mediate the association between negative affect and IGD for OP users, but did for HP users. The implications for future research on the mechanisms of IGD are discussed.

Keywords

Internet gaming disorder, dualistic model of passion, maladaptive coping, negative affect, life satisfaction, latent profile analysis

1. Introduction

Internet Gaming Disorder (IGD) is defined as a continued pattern of video gaming engagement contributing to maladaptive functioning (King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013; Petry & O'Brien, 2013; Petry, Zajac, & Ginley, 2018). It is a highly debated condition in the literature, as illustrated by the contrast between its inclusion as a condition meriting further study in the fifth edition of the Diagnostic and Statistical Manual for Mental Disorders (American Psychiatric Association, 2013) versus its recognition as a diagnosable condition in the eleventh edition of the International Classification of Diseases (World Health Organization, 2018). Nonetheless, research has demonstrated that high negative affect and poor life satisfaction are risk factors for IGD (Bargeron & Hormes, 2017; Billieux, Thorens, Khazaal, Zullino, & Achab, 2015; Mettler, Mills, & Heath, 2018). Using video games either to cope with or escape from negative affect and life stressors is implicated in IGD research (Wu, Lai, Yu, Lau, & Lei, 2017; Yee, 2006a), suggesting that this particular use of video games may explain the link between high negative affect and poor life satisfaction and IGD. However, these underlying relations may depend on users' enthusiasm or passion for video games as well as the extent to which they endorse an adaptive versus a maladaptive pattern of video game engagement.

According to the Dualistic Model of Passion (DMP) (Vallerand, 2010, 2015; Vallerand et al., 2003), some passionate video game users (i.e., harmoniously passionate [HP] users) possess an overtly positive pattern of video game engagement so that they can effectively manage their high involvement in video games minimizing conflicts between their video game use and other life obligations. On the other hand, other passionate video game users (i.e., obsessively passionate [OP] users) may feel compelled to play video games; perceiving video games as the only thing in their life that matters. Although these two types of video game users are expected to report comparable levels of passion for and involvement in video games, they differ theoretically in how they engage in video games. A few studies have demonstrated the positive association between obsessive passion for gaming and IGD (Lafrenière, Vallerand, Donahue, & Lavigne, 2009; Wang & Chu, 2007); however, no study has yet examined how risk mechanisms underlying IGD differed between HP and OP video game users. To that end, the present study aimed to explore the moderation effects of different types of passion for gaming on direct and indirect effects of negative affect and life satisfaction on IGD severity through the use of video gaming as a coping mechanism.

Video games allow users to be entertained, feel a sense of mastery and belonging, and offer a means to relaxing after a long day (King, Delfabbro, & Griffiths, 2010; Reinecke, 2009; Ryan, Rigby, & Przybylski, 2006). The vast majority of users play video games casually, but are not necessarily passionate for video games implying a level of identification with video gaming (Vallerand et al., 2003). However, for some, video gaming is a passion representing a key characteristic of their identity, which differs from being "addicted" to video games (Deleuze, Long, Liu, Maurage, & Billieux, 2018;

Vallerand, 2010). Consequently, accurately targeting this small subset of passionate video game users has eluded researchers studying IGD resulting in overestimating IGD prevalence due to classifying those who play enthusiastically, but do not experience any functional impairment due to gaming as IGD (Aarseth et al., 2017; Billieux et al., 2017; Charlton & Danforth, 2007; Kuss, Griffiths, & Pontes, 2016; van Rooij et al., 2018).

Video game users meeting the threshold for IGD tend to report higher negative affect (e.g., sadness, boredom, anger), mental distress (e.g., depressive symptoms, anxiety) and poorer life satisfaction (Bargeron & Hormes, 2017; Forrest, King, & Delfabbro, 2016; King & Delfabbro, 2016; Lemmens, Valkenburg, & Peter, 2009; Sarda, Bègue, Bry, & Gentile, 2016). Additionally, these users are more likely to use video games as coping mechanism that facilitates relief from negative emotions (Bowditch, Chapman, & Naweed, 2018; Hilgard, Engelhardt, & Bartholow, 2013; Loton, Borkoles, Lubman, & Polman, 2016; Milani et al., 2017; Schneider, King, & Delfabbro, 2017). Finally, IGD is associated with greater gaming frequency (Jeromin, Rief, & Barke, 2016; Laconi, Pirès, & Chabrol, 2017; Lemmens, Valkenburg, & Gentile, 2015; Sarda et al., 2016); however, high gaming frequency itself is not always associated with negative consequences (Király, Tóth, Urbán, Demetrovics, & Maraz, 2017). Therefore, gaming frequency may be best viewed as an indicator of passion for video gaming rather than IGD. A critical need for IGD research to progress further is a methodological approach that differentiates those who endorse IGD criteria due to their passion for gaming versus their uncontrollable compulsion to play video games.

The Dualistic Model of Passion (DMP) establishes a psychological conceptualization of a passion as a meaningful, self-defining activity within individuals' lives (Vallerand, 2010, 2015). Vallerand and colleagues (2003) propose three criteria that an activity must meet in order to be considered as a passion: an individual is passionate for an activity if he or she (1) invests a great deal of resources (e.g., time, energy, money) in the activity, (2) deeply enjoys the activity, and (3) strongly identifies with the activity. Prior research has found that deeper passion for video games is associated with stronger motivations for gaming, which include exploring a virtual world, socializing with other players, advancing to new levels, and immersing oneself within the video game (Fuster, Chamarro, Carbonell, & Vallerand, 2014).

The DMP further differentiates between two types of passion: harmonious passion and obsessive passion. Harmonious Passion (HP) emerges from an autonomous internationalization of the activity within the self. As such, the individuals effectively manage their own engagement in the activity, and experience benefits from engaging in their passion (Stenseng & Phelps, 2013). Obsessive Passion (OP) originates from a controlled internalization of the activity within the self. This implies that the individuals have limited or no control over their engagement and compulsively engage in their passion resulting negative consequences (Donahue et al., 2012; Ratelle, Vallerand, Mageau, Rousseau, &

Provencher, 2004). Individuals with HP and OP are assumed to present similar levels of passion for the activity; yet, they will meaningfully differ in how they engage in their passion and the consequences that stem from their engagement (Curran, Hill, Appleton, Vallerand, & Standage, 2015). Accordingly, it is plausible that video game users with HP and OP would present similar levels of passion for gaming and gaming frequency. However, differences may exist between HP and OP video game users in how previously identified risk factors (e.g., negative affect and maladaptive coping) are related to their IGD. Specifically, HP users possess an adaptive type of passion for gaming. Past research has shown that HP video game users create and maintain healthier friendships both online and offline (Perry et al., 2018; Utz, Jonas, & Tonkens, 2012). As such, it appears they play primarily for entertainment and socializing. Further, research suggests HP users may not rely on gaming as a palliative coping mechanism for negative emotions and stress (Fuster et al., 2014). Thus, HP video game users exhibit a high but healthy engagement in video gaming. Conversely, OP video game users may perceive video games as the main or solitary stimulating thing in their lives, thus developing an over attachment to video games, which ultimately lead to problematic and addictive gaming and associated psychosocial problems (Mills, Milyavskaya, Mettler, Heath, & Derevensky, 2018). It is therefore of particular interest that OP video game users are more likely to use video games as a means of disassociating from reality (Fuster et al., 2014), possibly as an escape from negative affect and poorer life satisfaction suggesting there may be differences in how such risk factors are related to IGD.

To that end, the present study examines differences in IGD severity between HP and OP video game users and explores the role of OP for gaming in the relationships among negative affect/life satisfaction, the use of video games as a palliative coping mechanism, and IGD. To investigate the second study objective, this study first assesses the role of using video gaming as a palliative coping strategy in mediating the effects of negative affect and life satisfaction on IGD severity. The hypothesized associations are presented in Figure 1A. Subsequently, the study assesses a moderated-mediation model within a subset of video game users identifying as either HP or OP for video gaming. Specifically, it is expected that types of passion for gaming (i.e., HP vs. OP) would moderate the direct effects of negative affect and life satisfaction on IGD severity as well as the indirect effect of negative affect and life satisfaction on IGD severity via the use of video games as a coping strategy (see Figure 1B). We hypothesized that the direct and indirect effects would be stronger for OP users compared to those for HP users.

Figure 1. Hypothesized Mediation (Figure A) and Moderated-Mediation (Figure B) Models

2. Method

2.1 Participants

Following informed consent, 1,046 adults (60.6% male) completed an online questionnaire using LimeSurvey software. Participants were recruited using email invitations, in-class announcements, and campus flyers as well as social media advertisements (e.g., Facebook, Reddit). Participants were excluded if they were under 18 years of age (n = 64), reported a duplicate IP address (n = 5), and did not report their gender (n = 8). The final sample included 969 participants (60.5% male; M = 23.49 years, SD = 6.83) with an average of 12.97 hours of gaming per week (SD = 13.54).

2.2 Measures

2.2.1 Internet Gaming Disorder

The nine items proposed by Petry and colleagues (2014) were used to assess IGD severity (α = .87 in the current sample). The items were slightly altered for participants to respond using a 5-point Likert scale, ranging from Not Agree at All (1) to Very Strongly Agree (5). The 5-point scale was selected as it would for a wider range of severity to be assessed compared to a dichotomous scale.

2.2.2 Passion for Video Gaming

Vallerand's (2010) Passion Scale was adapted to assess participants' passion for video gaming. The scale is made up of four items assessing participants' general passion for video gaming (e.g., I love this video games) (α = .90 in the current sample), six items assessing participants' HP for video gaming (e.g., Video gaming reflects the qualities I like about myself) (α = .88 in the current sample), and six items assessing participants' OP for video gaming (e.g., If I could, I would only play video games) (α = .85 in the current sample). Each item was rated on a 7-point scale ranging from Not Agree at All (1) to Very Strongly Agree (7).

2.2.3 Life Satisfaction

The 5-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was used to assess overall life satisfaction. Each item was rated on a 7-point scale ranging from Not Agree at All (1) to Very Strongly Agree (7) (α = .91 in the current sample).

2.2.4 Positive and Negative Affect

The International Positive and Negative Affect Scale—Short Form (Thompson, 2007) includes 10 adjectives that assess participants' positive affect (e.g., "inspired") and negative affect (e.g., "hostile"). Participants rated each item on a scale ranging from "Very Slightly or Not at All" (1) to Extremely (7) in terms of their general feelings. Two five-adjective subscales separately assess positive (α = .76 in the current sample) and negative affect (α = .80 in the current sample).

2.2.5 The Use of Video Games as a Palliative Coping

Two items assessed the use of video games as a coping strategy. The first item—"How frequently do you use video games to cope with stress?"—was rated on a scale ranging from Never (0) to Always (3). The second item—"How much of your use of video games is to cope with stress?"—was rated on a scale ranging from None, I don't find video game use helps me cope (0) to Almost whenever I play video games (3). As the correlation of these two items was high (r = .75), the two items were averaged to create a measure that assess the use of video gaming as a coping strategy.

2.3 Analytic Procedure

Missing values were estimated using expectation-maximization in SPSS version 24. Data were entered into Model 4 of the PROCESS bootstrapping macro for SPSS with 5,000 resamples to assess the direct and indirect paths among negative affect/life satisfaction, the use of video games as a coping strategy,

and IGD severity (see Figure 1A) (Preacher & Hayes, 2004). Gender, age, gaming frequency, and positive affect were included as covariates. Second, participants were classed in terms of their passion for video gaming using Latent Profile Analysis (LPA). LPA is a probabilistic modeling approach to identify homogenous subsamples that exist within the entire sample (Lubke & Muthén, 2005; Magidson & Vermunt, 2002). The LPA was conducted in Mplus version 7 with maximum likelihood estimation using averages from the three subscales of the Passion Scale (i.e., passion for video gaming, HP for video gaming, and OP for video gaming) (Muthén & Muthén, 2015). Model selection was based on Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC) and the Lo–Mendell–Rubin (LMR) likelihood ratio test and the Bootstrap Likelihood Ratio Test (BLRT), as recommended in the literature (Nylund, Asparouhov, & Muthén, 2007; Tein, Coxe, & Cham, 2013). Lower values for the AIC and BIC is indicative of a more parsimonious model, whereas a significant p-value for the LMR and BLRT implies that the model with k profiles is more preferred over the model with k-1 profiles (Lo, Mendell, & Rubin, 2001; McLachlan & Peel, 2000). The resulting profiles were subsequently exported to SPSS, and bivariate tests were conducted to examine the differences in IGD, gaming frequency, the use of video games as coping, and negative affect among classified groups with regard to their passion for gaming. Finally, Model 59 of the PROCESS macro for SPSS was used to assess the hypothesized moderation-mediation effects using data from participants who identified as either HP or OP for gaming based on the LPA results (see Figure 1B). A moderated-mediation exists if either or both paths of the mediation model are dependent upon the moderator (Hayes, 2015; Preacher, Rucker, & Hayes, 2007). The index of moderated-mediation was used to confirm that the differences were significantly different from zero (Hayes, 2015; Hayes, Montoya, & Rockwood, 2017).

3. Result

3.1 Descriptive Statistics

Table 1 provides means, standard deviations, and bivariate correlations among all variables included in this study. The positive association between OP for gaming and IGD was expected, however, the strength of this association was higher than anticipated (r = .80, p < .001).

Table 1. Means, Standard Deviations, and Bivariate Correlations

		1	2	3	4	5	6	7	8	9	10
1.	Age	1.00									
2.	TSG	-.03	1.00								
3.	GtC	-.01	.30*	1.00							
4.	IGD	-.08	.29*	.45*	1.00						
5.	LS	-.03	-.17*	-.21*	-.22*	1.00					
6.	NA	-.12*	.04	.25*	.41*	-.44*	1.00				
7.	PA	-.03	-.13*	-.13*	-.15*	.46*	-.18*	1.00			
8.	PfG	-.05	.55*	.44*	.44*	-.09	.08	-.06	1.00		
9.	HP	-.04	.35*	.35*	.27*	.03	.03	.07	.76*	1.00	
10.	OP	-.09	.34*	.38*	.80*	-.11*	.30*	-.08	.52*	.32*	1.00
M		23.49	12.97	1.20	1.77	4.03	2.18	3.25	4.09	3.92	2.02
SD		6.83	13.54	0.77	0.72	1.50	0.80	0.74	1.72	1.51	1.09

TSG = Time Spent Gaming; GtC = Gaming to Cope; IGD = Internet Gaming Disorder; LS = Life Satisfaction; NA = Negative Affect; PA = Positive Affect; PfG = Passion for Gaming; HP = Harmonious Passion for Gaming; OP = Obsessive Passion for Gaming.

* p < .001.

3.2 Mediation Models

Two hypothesized mediation models were tested whereby using video games as a coping strategy would mediate a) the relation between negative affect and IGD severity, and b) the relation between life satisfaction and IGD severity (see Figure 1A). Within each model, the effects of gender, age, gaming frequency, and positive affect were controlled. Data were included in Model 4 of the PROCESS bootstrapping macro with 5,000 resamples. Results are described in sections 3.2.1 and 3.2.2.

3.2.1 Relationships among Negative Affect, Coping, and IGD

Results from the total effect model (i.e., without the mediator) indicated that negative affect is significantly associated with greater IGD severity (path c: B = .35, 95CI [.30, .40], p < .001). With the inclusion of the mediator, results revealed significant associations between negative affect and using

video games as a coping strategy (path a: B = .23, 95CI [.17, .28], p < .001), using video games as a coping strategy and IGD severity (path b: B = .29, 95CI [.24, .34], p < .001), and negative affect and IGD severity (path c: B = .28, 95CI [.23, .33], p < .001). The indirect effect of negative affect on IGD severity through the use of video games as a coping strategy was significant (B = .07, 95CI [.04, .09]), accounting for 20.00% of the total effect of negative affect on IGD severity.

3.2.1 Relationships among Life Satisfaction, Coping, and IGD

Results from the total effect model (i.e., without the mediator) indicated that life satisfaction was significantly associated with less IGD severity (path c: B = -.07, 95CI [-.11, -.04], p < .001). With the inclusion of the mediator, results revealed significant associations between life satisfaction and using video games as a coping strategy (path a: B = -.08, 95CI [-.11, -.04], p < .001), the use of video games as a coping strategy and IGD severity (path b: B = .35, 95% CI [.30, .41], p < .001), and life satisfaction and IGD severity (path c: B = -.05, 95CI [-.08, -.02], p < .001). The indirect effect of life satisfaction on IGD severity through the use of video games as a coping strategy is significant (B = -.03, 95CI [-.04, -.01]), accounting for 42.86% of the total effect of life satisfaction on IGD severity.

3.3 Latent Profile Analysis

Seven LPA models ranging from one to seven profiles were conducted to identify homogeneous subsamples based on averages of the general passion for video gaming subscale, HP for video gaming subscale, and OP for video gaming subscale. Table 2 presents the fit indices for each of the model. Based on the values of AIC and BIC and the results from the LMR test, the 4-profile model was selected. The BLRT was significant for each model, and thus, did not weigh on the model selection. The four profiles were minimally passionate users (n = 223, 23.01%), moderately passionate users (n = 307, 31.68%), and highly passionate users classified as harmoniously passionate users (n = 299, 30.86%), and obsessively passionate users (n = 140, 14.45%). Table 3 presents the overall differences in all variables (e.g., IGD, gaming frequency, and the use of video games as a coping strategy) among the four profiles. Notably, HP and OP users did not differ significantly in the levels of general passion for gaming or gaming frequency (p < .05). Significant gender difference was found among the four groups with different types of gaming passion ($\chi^2(3) = 97.29$, p < .001), whereby a greater proportion of males versus females were classified as either HP or OP users. Additionally, OP video game users reported greater IGD severity compared to all other users (Note 1).

Finally, a comparison of correlations between HP and OP video game users supported further exploration into the potential moderated-mediation effects. First, using video games as a coping strategy was associated with IGD severity for HP video game users (r = .38, p < .001), but not for OP video game users (r = .05, p = .59). Second, the association between life satisfaction and IGD severity was significant for HP video game users (r = -.21, p < .001), but not for OP video game users (r = .04, p = .68).

Table 2. Fit Indices of the Latent Profile Analysis

	AIC	BIC	Entropy	LMR	BLRT
Profile 1	10277.13	10306.39			
Profile 2	9348.64	9397.40	0.84	< .001	< .001
Profile 3	9060.78	9129.05	0.83	< .001	< .001
Profile 4	**8884.81**	**8972.58**	**0.79**	**.002**	**< .001**
Profile 5	8749.12	8856.40	0.82	.109	< .001
Profile 6	8640.50	8767.28	0.82	.101	< .001
Profile 7	8555.03	8701.32	0.83	.818	< .001

Table 3. Average Reports across the Four Passion for Gaming Profiles

	Passion for Gaming Profiles								
	Minimally Passionate (n = 223, 23.01%)		Moderately Passionate (n = 307, 31.68%)		Harmoniously Passionate (n = 299, 30.86%)		Obsessively Passionate (n = 140, 14.45%)		***Univariate Tests***
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	
Passion for Gaming	1.77[a]	0.55	3.56[b]	0.76	5.67[c]	0.72	5.58[c]	0.99	$F(3,965) = 1416.01^{***}$ $\eta_p^2 = .82$
HP for Gaming	1.92[a]	0.79	3.81[b]	0.87	5.18[c]	0.88	4.64[d]	1.11	$F(3,965) = 602.45^{***}$ $\eta_p^2 = .65$
OP for Gaming	1.20[a]	0.30	1.74[b]	0.69	1.94[c]	0.65	4.09[d]	0.75	$F(3,965) = 675.48^{***}$ $\eta_p^2 = .68$
Gender	37.2% male (n = 83)		57.3% male (n = 176)		69.6% male (n = 208)		85% male (n = 119)		$\chi^2(3) = 97.29^{***}$
Age	24.26[a]	9.50	23.49[a]	6.56	23.13[a]	5.33	23.01[a]	4.91	$F(3,965) = 1.46$ $\eta_p^2 = .01$
Time Spent Gaming	3.74[a]	4.25	9.70[b]	8.45	19.15[c]	13.38	21.66[c]	19.74	$F(3,965) = 106.80^{***}$ $\eta_p^2 = .25$
Gaming to Cope	0.67[a]	0.64	1.17[b]	0.71	1.40[c]	0.68	1.66[d]	0.80	$F(3,965) = 71.34^{***}$

									$\eta_p^2 = .18$
IGD	1.26[a]	0.39	1.67[b]	0.59	1.72[b]	0.48	2.87[c]	0.72	$F(3,965) = 264.62^{***}$ $\eta_p^2 = .45$
Life Satisfaction	4.27[a]	1.51	3.92[a,b]	1.47	4.09[a,b]	1.50	3.77[b]	1.51	$F(3,965) = 4.11^{**}$ $\eta_p^2 = .01$
Negative Affect	2.02[a]	0.76	2.22[a]	0.77	2.04[a]	0.75	2.62[b]	0.86	$F(3,965) = 21.48^{***}$ $\eta_p^2 = .06$
Positive Affect	3.29[a]	0.73	3.24[a]	0.75	3.26[a]	0.70	3.17[a]	0.79	$F(3,965) = 0.47$ $\eta_p^2 = .00$

Note: Different superscripts represent significant differences ($p \leq .001$) based on Bonferroni post-hoc tests.

* p < .05; ** p < .01; *** p < .001.

3.4 Moderated-Mediation Model

As per the primary objectives, only participants classified in the profiles of HP and OP for gaming were included in the subsequent moderated-mediation test (n = 439). Two hypothesized moderated-mediation models were examined whereby passion type (HP vs. OP) moderated the mediating effects of using video games as a coping strategy within the association between a) negative affect and IGD severity, and b) life satisfaction and IGD severity. Data were included in Model 59 of the PROCESS bootstrapping macro with 5,000 resamples.

3.4.1 Negative Affect, Coping, IGD, and Passion Type

The index of moderated-mediation supports the overall effect of passion type in moderating the indirect effect of using video games to cope within the association between negative affect and IGD severity (Index = -.05, 95CI [-.09, -.01]). First, path c' is moderated by passion type (B = .16, 95CI [.03, .30], p = .015). Specifically, the positive association between negative affect and IGD severity is stronger for OP users (B = .48, 95CI [.41, .55], p < .001) than HP users (B = .21, 95CI [.14, .28], p < .001) (See Figure 2A). Second, path b is significantly moderated by passion type (B = -.22, 95CI [-.36, -.07], p = .003) such that using video game as a coping strategy was associated with IGD severity for HP video game users (B = .22, 95CI [.15, .29], p < .001), but not for OP video game users (B = .01, 95CI [-.06, .08], p > .05) (see Figure 2B). The association between negative affect and the use of video games as a coping strategy (path a) was not moderated by passion type (p > .05).

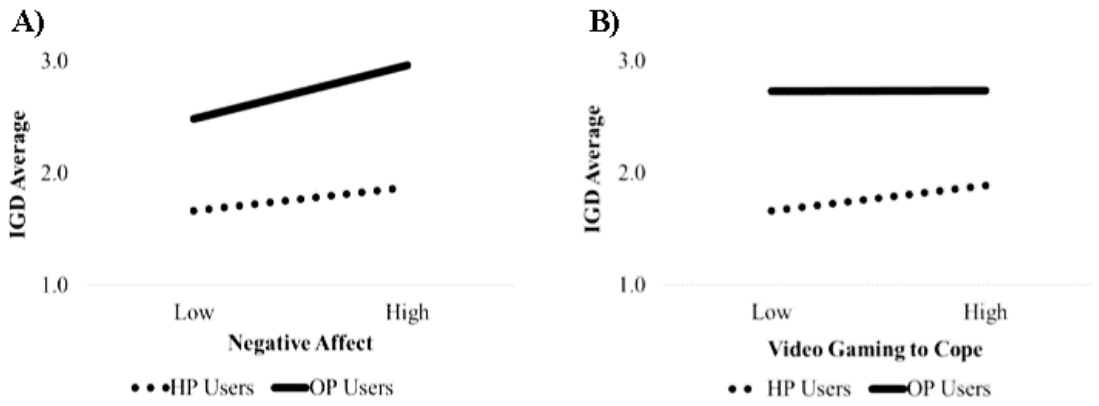

Figure 2. Graphical Depictions of the Differences in the Association between Negative Affect and IGD (Figure A) and Video Gaming to Cope and IGD (Figure B) between Harmonious (HP) and Obsessively (OP) Passionate Video Game Users

3.4.2 Life Satisfaction, Coping, IGD, and Passion Type

The index of moderated-mediation did not support the overall effect of passion type in moderating the indirect effect of using video games to cope within the association between life satisfaction and IGD severity (Index = .01, 95CI [-.02, .04]).

4. Discussion

The purpose of the present study was to explore the significant differences between video game users with different types of passion for gaming in the risk factors underpinning IGD. The findings revealed that though OP and HP video game users reported similar gaming frequency and general passion for video gaming, OP video game users reported significantly higher levels of IGD and the use of video games as a palliative coping mechanism. The hypotheses that the use of video games as a palliative coping mechanism significantly mediated the effects of both negative affect and life satisfaction on IGD severity were supported. However, the two hypothesized moderated-mediation models were only partially supported. Specifically, passion type moderated the direct and indirect effects of negative affect on IGD severity through using video games to cope but did not moderate a similar model assessing the direct and indirect effects of life satisfaction on IGD severity through using video games to cope.

The mediation role of video gaming as a palliative coping for negative affect and poorer life satisfaction observed in the current study is consistent with the extensive literature. Using video games to cope with negative emotions and affect has been viewed as a risk mechanism for IGD, and has been explored in numerous studies over the past few years, often from the perspective that it is a primary motivation associated with problem gaming (Demetrovics et al., 2011; Myrseth, Notelaers, Strand,

Borud, & Olsen, 2017; Yee, 2006b). Video games could facilitate escape from life stressors and provide social outlet. Thus, some users may play video games intensively to relieve negative feelings (e.g., sadness, boredom, loneliness) by immersing in video games and dissociating themselves from the real-world. Prior findings have shown that the use of video games as a maladaptive coping strategy might have been characterized as a general avoidance coping process (Reinecke, 2009). Avoidance and dissociation coping have been identified as a risk factor for a variety type of addictions, including IGD (Bowditch et al., 2018; Schneider et al., 2017). More recently, research has found that using video games as a palliative coping mechanism explains the associations between IGD and different personality and psychological factors, including psychiatric distress (Ballabio et al., 2017; Király et al., 2015), self-concept clarity (Šporčić & Glavak-Tkalić, 2018), and Dark Tetrad personality traits (i.e., Machiavellianism, psychopathy, narcissism, and sadism) (Kircaburun, Jonason, & Griffiths, 2018). Our findings contribute to this growing literature in revealing a further meditational role of the use of video games to cope linking the association between negative affect/poorer life satisfaction and IGD severity.

To further disentangle the characteristics and the underlying factors of IGD between adaptive and maladaptive types of passion for gaming, the current sample was classified based on their type of passion for video gaming. The present study is the first to employ probabilistic modeling (i.e., LPA) to examine participants' responses to the adapted Passion Scale for video games (Marsh et al., 2013; Vallerand, 2010). The LPA resulted in the identification of two non-passionate video game user profiles (i.e., those who are minimally passionate and moderately passionate for video games), and two passionate video game user profiles (i.e., those who are harmoniously and obsessively passionate for video games). As expected, IGD was most severe for those classified as OP video game users. Additionally, OP video game users reported significantly greater use of video games to cope with stress and higher negative affect relative to other users. However, as expected, HP and OP users did not significantly differ in their levels of overall passion for gaming or their video gaming frequency. The lack of a significant difference in the frequency video gaming is consistent with Deleuze and colleagues' (2018) comparison between passion and addiction criteria for gaming. As such, the present findings offer further evidence that the amount of time spent gaming is not indicative of anything beyond a users' passion for video gaming.

Finally, results from the moderated-mediation evaluation indicated that passion type moderated two of the three associations among negative affect, using video games to cope, and IGD severity. First, in line with expectations, the association between negative affect and IGD was significantly stronger for OP video game users compared to HP video game users. Second, conflicting with expectations, the association between the use of video games as a palliative coping mechanism and IGD was significant for HP, but not OP video game users. Collectively, these findings revealed that video gaming to cope mediates the association between negative affect and IGD severity for HP video game users, but not OP

video game users.

The stronger association between negative affect and IGD for OP video game users relative to HP video game users is consistent with our expectations. It highlights the compounding effect of both negative feelings and a compulsive passion for gaming in relation to IGD. Thus, users who engage in video games with a maladaptive passion and experience higher levels of negative affect may have more severe IGD. However, the lack of an association between video gaming to cope and IGD for OP video game users was unexpected. It is possible that OP video game users have already developed a reliance upon video games as a maladaptive coping mechanism to the point that their engagement in video games for this reason does not offer any further explanation for IGD. The strong association between OP and avoidance coping has been consistently observed in past studies (e.g., Verner-Filion et al., 2014). It should also be considered that the present study conceptualized and assessed gaming as a palliative coping with reference to the frequency participants use video game to cope with stress. Demetrovics and colleagues (2011) recommend differentiating “coping with” and “escaping from” in which the former represents relaxing or alleviating a negative emotion (e.g., boredom), whereas the latter is an active avoidance of negative thoughts and feelings through video game engagement. It is possible that using video games to escape from, versus relieve negative affect has a different role in explaining IGD between HP and OP users. Therefore, future research examining the differences in underlying mechanisms of IGD between users with adaptive and maladaptive gaming passion should consider the distinguished coping style.

However, possibly more interesting is that the present findings speak to the fluidity of IGD in that video gaming to cope does explain the link between negative affect and IGD for HP video game users. As such, significant changes in their experience of negative affect may alter HP video game users’ pattern of engagement. Once HP video game users develop a maladaptive video game engagement in which they start to rely on gaming as a palliative coping strategy, they may be placed at an increased risk for IGD. Accordingly, the present findings imply a need for clinicians to address issues of emotion dysregulation in IGD clients and for prevention programs to teach adaptive means for responding to stressors in daily life (Yen et al., 2018).

The present study has several limitations. First, self-report data allows for the potential of biases (e.g., social-desirability, estimates of behavior) as well as misinterpreted items. However, high internal consistency of measures included in the study provides strong evidence that participants had generally interpreted each item correctly. Second, the convenience sampling method infers self-selection bias. However, about one-third of the participants were found to be minimally passionate. Although this is not necessarily evidence of a representative sample, it does suggest that the present data included a wide range of video game users. Nonetheless, future research should attempt to recruit more representative samples, as well as examine the differences in profiles among various developmental

periods. Finally, the use of cross-sectional data precluded any casual relationships between the potential risk factors, including negative affect, poor life satisfaction, and gaming as a palliative coping mechanism, and IGD.

IGD has significant deleterious consequences on individual's life and mental well-being. IGD has been strongly associated with higher levels of depression, anxiety, loneliness and emotion dysregulation (Burleigh, Stavropoulos, Liew, Adams, & Griffiths, 2018; Kim et al., 2016; Lee et al., 2017; Lemmens et al., 2015; Myrseth, Olsen, Strand, & Borud, 2017; Stockdale & Coyne, 2018; Wang, Cho, & Kim, 2018; Yen et al., 2018). However, we need to better distinguish people who are enthusiastic about gaming without experiencing negative consequences from those who truly experience gaming disorder. When disentangling individuals' style of engagement (adaptive engagement vs. addictive and obsessive engagement), it is important to consider and account for the different types of passion they have for gaming in addition to the amount of gaming engagement and motives of using gaming as a coping strategy. The present study highlights that although a high level of passion for gaming is significantly associated with problem gaming, users who are obsessively passionate for gaming may experience more severe IGD compared to those have harmonious gaming passion. In addition, the risk mechanisms underlying IGD may be different between harmoniously and obsessively passionate video gamers. We hope future research considers the present findings in understanding potential risk and protective factors for problem video gaming based on passion profiles.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author. https://doi.org/10.1176/appi.books.9780890425596

Aarseth, E., Bean, A. M., Boonen, H., Colder Carras, M., Coulson, M., Das, D., & Van Rooij, A. J. (2017). Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal. *Journal of Behavioral Addictions*, *6*(3), 267-270. https://doi.org/10.1556/2006.5.2016.088

Ballabio, M., Griffiths, M. D., Urbán, R., Quartiroli, A., Demetrovics, Z., & Király, O. (2017). Do gaming motives mediate between psychiatric symptoms and problematic gaming? An empirical survey study. *Addiction Research & Theory*, *25*(5), 397-408. https://doi.org/10.1080/16066359.2017.1305360

Bargeron, A. H., & Hormes, J. M. (2017). Psychosocial correlates of internet gaming disorder: Psychopathology, life satisfaction, and impulsivity. *Computers in Human Behavior*, *68*, 388-394. https://doi.org/10.1016/j.chb.2016.11.029

Billieux, J., King, D. L., Higuchi, S., Achab, S., Bowden-Jones, H., Hao, W., & Poznyak, V. (2017). Functional impairment matters in the screening and diagnosis of gaming disorder. *Journal of*

Behavioral Addictions, *6*(3), 285-289. https://doi.org/10.1556/2006.6.2017.036

Billieux, J., Thorens, G., Khazaal, Y., Zullino, D., & Achab, S. (2015). Problematic involvement in online games: A cluster analytic approach. *Computers in Human Behavior*, *43*, 242-250. https://doi.org/10.1016/j.chb.2014.10.055

Bowditch, L., Chapman, J., & Naweed, A. (2018). Do coping strategies moderate the relationship between escapism and negative gaming outcomes in World of Warcraft (MMORPG) players? *Computers in Human Behavior*, *86*, 69-76. https://doi.org/10.1016/j.chb.2018.04.030

Burleigh, T. L., Stavropoulos, V., Liew, L. W. L., Adams, B. L. M., & Griffiths, M. D. (2018). Depression, Internet gaming disorder, and the moderating effect of the gamer-avatar relationship: An exploratory longitudinal study. *International Journal of Mental Health and Addiction*, *16*(1), 102-124. https://doi.org/10.1007/s11469-017-9806-3

Charlton, J., & Danforth, I. (2007). Distinguishing addiction and high engagement in the context of online game playing. *Computers in Human Behavior*, *23*, 1531-1548. https://doi.org/10.1016/j.chb.2005.07.002

Curran, T., Hill, A. P., Appleton, P. R., Vallerand, R. J., & Standage, M. (2015). The psychology of passion: A meta-analytical review of a decade of research on intrapersonal outcomes. *Motivation and Emotion*, *39*(5), 631-655. https://doi.org/10.1007/s11031-015-9503-0

Deleuze, J., Long, J., Liu, T. Q., Maurage, P., & Billieux, J. (2018). Passion or addiction? Correlates of healthy versus problematic use of videogames in a sample of French-speaking regular players. *Addictive Behaviors*, *82*, 114-121. https://doi.org/10.1016/j.addbeh.2018.02.031

Demetrovics, Z., Urbán, R., Nagygyörgy, K., Farkas, J., Zilahy, D., Mervó, B., & Harmath, E. (2011). Why do you play? The development of the Motives for Online Gaming Questionnaire (MOGQ). *Behavior Research Methods*, *43*(3), 814-825. https://doi.org/10.3758/s13428-011-0091-y

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, *49*(1), 71-75. https://doi.org/10.1207/s15327752jpa4901_13

Donahue, E. G., Forest, J., Vallerand, R. J., Lemyre, P. N., Crevier-Braud, L., & Bergeron, É. (2012). Passion for work and emotional exhaustion: The mediating role of rumination and recovery. *Applied Psychology: Health and Well-Being*, *4*(3), 341-368. https://doi.org/10.1111/j.1758-0854.2012.01078.x

Forrest, C. J., King, D. L., & Delfabbro, P. H. (2016). The measurement of maladaptive cognitions underlying problematic video-game playing among adults. *Computers in Human Behavior*, *55*, 399-405. https://doi.org/10.1016/j.chb.2015.09.017

Fuster, H., Chamarro, A., Carbonell, X., & Vallerand, R. J. (2014). Relationship between passion and motivation for gaming in players of massively multiplayer online role-playing games. *Cyberpsychology, Behavior and Social Networking*, *17*(5), 292-297.

https://doi.org/10.1089/cyber.2013.0349

Hayes, A. F. (2015). An Index and Test of Linear Moderated Mediation. *Multivariate Behavioral Research*, *50*(1), 1-22. https://doi.org/10.1080/00273171.2014.962683

Hayes, A. F., Montoya, A. K., & Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal*, *25*(1), 76-81. https://doi.org/10.1016/j.ausmj.2017.02.001

Hilgard, J., Engelhardt, C. R., & Bartholow, B. D. (2013). Individual differences in motives, preferences, and pathology in video games: The gaming attitudes, motives, and experiences scales (GAMES). *Frontiers in Psychology*, *4*, 608. https://doi.org/10.3389/fpsyg.2013.00608

Jeromin, F., Rief, W., & Barke, A. (2016). Validation of the Internet gaming disorder questionnaire in a sample of adult German-speaking internet gamers. *Cyberpsychology, Behavior, and Social Networking*, *19*(7), 453-459. https://doi.org/10.1089/cyber.2016.0168

Kim, N. R., Hwang, S. S. H., Choi, J. S., Kim, D. J., Demetrovics, Z., Király, O., & Choi, S. W. (2016). Characteristics and psychiatric symptoms of internet gaming disorder among adults using self-reported DSM-5 criteria. *Psychiatry Investigation*, *13*(1), 58-66. https://doi.org/10.4306/pi.2016.13.1.58

King, D. L., & Delfabbro, P. H. (2016). The Cognitive Psychopathology of Internet Gaming Disorder in Adolescence. *Journal of Abnormal Child Psychology*, *44*(8), 1635-1645. https://doi.org/10.1007/s10802-016-0135-y

King, D. L., Delfabbro, P. H., & Griffiths, M. D. (2010). Video Game Structural Characteristics: A New Psychological Taxonomy. *International Journal of Mental Health and Addiction*, *8*(1), 90-106. https://doi.org/10.1007/s11469-009-9206-4

King, D. L., Haagsma, M. C., Delfabbro, P. H., Gradisar, M., & Griffiths, M. (2013). Toward a consensus definition of pathological video-gaming: A systematic review of psychometric assessment tools. *Clinical Psychology Review*, *33*(3), 331-342. https://doi.org/10.1016/j.cpr.2013.01.002

Király, O., Tóth, D., Urbán, R., Demetrovics, Z., & Maraz, A. (2017). Intense video gaming is not essentially problematic. *Psychology of Addictive Behaviors*, *31*(7), 807-817. https://doi.org/10.1037/adb0000316

Király, O., Urbán, R., Griffiths, M. D., Ágoston, C., Nagygyörgy, K., Kökönyei, G., & Demetrovics, Z. (2015). The mediating effect of gaming motivation between psychiatric symptoms and problematic online gaming: An online survey. *Journal of Medical Internet Research*, *17*(4), e88. https://doi.org/10.2196/jmir.3515

Kircaburun, K., Jonason, P. K., & Griffiths, M. D. (2018). The Dark Tetrad traits and problematic online gaming: The mediating role of online gaming motives and moderating role of game types.

Personality and Individual Differences, *135*, 298-303. https://doi.org/10.1016/j.paid.2018.07.038

Kuss, D. J., Griffiths, M. D., & Pontes, H. M. (2016). Chaos and confusion in DSM-5 diagnosis of Internet Gaming Disorder: Issues, concerns, and recommendations for clarity in the field. *Journal of Behavioral Addictions*, 1-7. https://doi.org/10.1556/2006.5.2016.062

Laconi, S., Pirès, S., & Chabrol, H. (2017). Internet gaming disorder, motives, game genres and psychopathology. *Computers in Human Behavior*, *75*, 652-659. https://doi.org/10.1016/j.chb.2017.06.012

Lafrenière, M. A. K., Vallerand, R. J., Donahue, E. G., & Lavigne, G. (2009). On the costs and benefits of gaming: The role of passion. *Cyberpsychology & Behavior*, *12*(3), 285-290. https://doi.org/10.1089/cpb.2008.0234

Lee, S. Y., Lee, H. K., Jeong, H., Yim, H. W., Bhang, S. Y., Jo, S. J., & Kweon, Y. S. (2017). The hierarchical implications of internet gaming disorder criteria: Which indicate more severe pathology? *Psychiatry Investigation*, *14*(3), 249-259. https://doi.org/10.4306/pi.2017.14.3.249

Lemmens, J. S., Valkenburg, P. M., & Gentile, D. A. (2015). The Internet Gaming Disorder Scale. *Psychological Assessment*, *27*(2), 567-582. https://doi.org/10.1037/pas0000062

Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, *12*(1), 77-95. https://doi.org/10.1080/15213260802669458

Lo, Y., Mendell, N. R., & Rubin, D. R. (2001). Testing the number of components in a normal mixture. *Biometrika*, *88*(3), 767-778. https://doi.org/10.1093/biomet/88.3.767

Loton, D., Borkoles, E., Lubman, D., & Polman, R. (2016). Video Game Addiction, Engagement and Symptoms of Stress, Depression and Anxiety: The Mediating Role of Coping. *International Journal of Mental Health and Addiction*, *14*(4), 565-578. https://doi.org/10.1007/s11469-015-9578-6

Lubke, G. H., & Muthén, B. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods*, *10*(1), 21-39. https://doi.org/10.1037/1082-989X.10.1.21

Magidson, J., & Vermunt, J. K. (2002). Latent class models for clustering: A comparison with K-means. *Canadian Journal of Marketing Research*, *20*(1), 37-44. https://doi.org/ISSN: 1614-1881

Marsh, H. W., Vallerand, R. J., Lafrenière, M. K., Parker, P., Carbonneau, N., Jowett, S., & Paquet, Y. (2013). Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychological Assessment*, *25*(3), 796-806. https://doi.org/10.1037/a0032573

McLachlan, G., & Peel, D. (2000). *Finite Mixture Models*. Hoboken, NJ, USA: John Wiley & Sons, Inc. https://doi.org/10.1002/0471721182

Mettler, J., Mills, D. J., & Heath, N. L. (2018). Problematic Gaming and Subjective Well-Being: How

Does Mindfulness Play a Role ?

Milani, L., la Torre, G., Fiore, M., Grumi, S., Gentile, D. A., Ferrante, M., & Di Blasio, P. (2017). Internet Gaming Addiction in Adolescence: Risk Factors and Maladjustment Correlates. *International Journal of Mental Health and Addiction*, 1-17. https://doi.org/10.1007/s11469-017-9750-2

Mills, D. J., Milyavskaya, M., Mettler, J., Heath, N. L., & Derevensky, J. L. (2018). How do passion for video games and needs frustration explain time spent gaming? *British Journal of Social Psychology*, *57*, 461-481. https://doi.org/10.1111/bjso.12239

Muthén, L. K., & Muthén, B. O. (Eds.) (7th ed.). (2015). *Mplus User's Guide*. Los Angeles, CA.

Myrseth, H., Notelaers, G., Strand, L. Å., Borud, E. K., & Olsen, O. K. (2017). Introduction of a new instrument to measure motivation for gaming: The electronic gaming motives questionnaire. *Addiction*, *112*(9), 1658-1668. https://doi.org/10.1111/add.13874

Myrseth, H., Olsen, O. K., Strand, L. Å., & Borud, E. K. (2017). Gaming behavior among conscripts: The role of lower psychosocial well-being factors in explaining gaming addiction. *Military Psychology*, *29*(2), 128-142. https://doi.org/10.1037/mil0000148

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(4), 535-569. https://doi.org/10.1080/10705510701575396

Perry, R., Drachen, A., Kearney, A., Kriglstein, S., Nacke, L. E., Sifa, R., & Johnson, D. (2018). Online-only friends, real-life friends or strangers? Differential associations with passion and social capital in video game play. *Computers in Human Behavior*, *79*, 202-210. https://doi.org/10.1016/j.chb.2017.10.032

Petry, N. M., & O'Brien, C. P. (2013). Internet gaming disorder and the DSM-5. *Addiction*, *108*(7), 1186-1187. https://doi.org/10.1111/add.12162

Petry, N. M., Rehbein, F., Gentile, D. A., Lemmens, J. S., Rumpf, H. J., Mößle, T., & O'Brien, C. P. (2014). An international consensus for assessing internet gaming disorder using the new DSM-5 approach. *Addiction*, *109*(9), 1399-1406. https://doi.org/10.1111/add.12457

Petry, N. M., Zajac, K., & Ginley, M. K. (2018). Behavioral Addictions as Mental Disorders: To Be or Not To Be? *Annual Review of Clinical Psychology*, *14*(1), 399-423. https://doi.org/10.1146/annurev-clinpsy-032816-045120

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717-731. https://doi.org/10.3758/BF03206553

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing Moderated Mediation Hypotheses:

Theory, Methods, and Prescriptions. *Multivariate Behavioral Research, 42*(1), 185-227. https://doi.org/10.1080/00273170701341316

Ratelle, C. F., Vallerand, R. J., Mageau, G. A., Rousseau, F. L., & Provencher, P. (2004). When passion leads to problematic outcomes: A look at gambling. *Journal of Gambling Studies, 20*(2), 105-119. https://doi.org/10.1023/B:JOGS.0000022304.96042.e6

Reinecke, L. (2009). Games and recovery: The use of video and computer games to recuperate from stress and strain. *Journal of Media Psychology, 21*(3), 126-142. Retrieved from http://psycnet.apa.orgjournals/jmp/21/3/126

Ryan, R. M., Rigby, C. S., & Przybylski, A. K. (2006). The motivational pull of video games: A Self-Determination Theory approach. *Motivation and Emotion, 30*(4), 344-360. https://doi.org/10.1007/s11031-006-9051-8

Sarda, E., Bègue, L., Bry, C., & Gentile, D. (2016). Internet Gaming Disorder and Well-Being: A Scale Validation. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 674-679. https://doi.org/10.1089/cyber.2016.0286

Schneider, L. A., King, D. L., & Delfabbro, P. H. (2017). Maladaptive Coping Styles in Adolescents with Internet Gaming Disorder Symptoms. *International Journal of Mental Health and Addiction, 6*, 1-12. https://doi.org/10.1007/s11469-017-9756-9

Šporčić, B., & Glavak-Tkalić, R. (2018). The relationship between online gaming motivation, self-concept clarity and tendency toward problematic gaming. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 12*(1). https://doi.org/10.5817/CP2018-1-4

Stenseng, F., & Phelps, J. (2013). Leisure and life satisfaction: The role of passion and life domain outcomes. *World Leisure Journal, 55*(4), 320-332. https://doi.org/10.1080/04419057.2013.836558

Stockdale, L., & Coyne, S. M. (2018). Video game addiction in emerging adulthood: Cross-sectional evidence of pathology in video game addicts as compared to matched healthy controls. *Journal of Affective Disorders, 225*(June 2017), 265-272. https://doi.org/10.1016/j.jad.2017.08.045

Tein, J. Y., Coxe, S., & Cham, H. (2013). Statistical Power to Detect the Correct Number of Classes in Latent Profile Analysis. *Structural Equation Modeling: A Multidisciplinary Journal, 20*(4), 640-657. https://doi.org/10.1080/10705511.2013.824781

Thompson, E. R. (2007). Development and Validation of an Internationally Reliable Short-Form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227-242. https://doi.org/10.1177/0022022106297301

Utz, S., Jonas, K. J., & Tonkens, E. (2012). Effects of passion for massively multiplayer online role-playing games on interpersonal relationships. *Journal of Media Psychology, 24*(2), 77-86.

Vallerand, R. J. (2010). On Passion for Life Activities. *Advances in Experimental Social Psychology, 42*, 97-193. https://doi.org/10.1016/S0065-2601(10)42003-1

Vallerand, R. J. (2015). *The psychology of passion: A dualistic model*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199777600.001.0001

Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., & Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, *85*(4), 756-767. https://doi.org/10.1037/0022-3514.85.4.756

van Rooij, A. J., Ferguson, C. J., Colder Carras, M., Kardefelt-Winther, D., Shi, J., Aarseth, E., & Przybylski, A. K. (2018). A weak scientific basis for gaming disorder: Let us err on the side of caution. *Journal of Behavioral Addictions*, *7*(1), 1-9. https://doi.org/10.1556/2006.7.2018.19

Verner-Filion, J., Vallerand, R. J., Donahue, É. G., Moreau, É., Martin, A., & Mageau, G. A. (2014). Passion, coping and anxiety in Sport: The interplay between key motivation and self-regulatory processes. *International Journal of Sport Psychology*, *45*(November), 516-537. https://doi.org/10.7352/IJSP2014.45.516

Wang, C. C., & Chu, Y. S. (2007). Harmonious passion and obsessive passion in playing online games. *Social Behavior and Personality*, *35*(7), 997-1006. https://doi.org/10.2224/sbp.2007.35.7.997

Wang, H. R., Cho, H., & Kim, D. J. (2018). Prevalence and correlates of comorbid depression in a nonclinical online sample with DSM-5 internet gaming disorder. *Journal of Affective Disorders*, *226*, 1-5. https://doi.org/10.1016/j.jad.2017.08.005

World Health Organization. (2018). *Gaming disorder: Online Q&A*. Retrieved from http://www.who.int/features/qa/gaming-disorder/en/

Wu, A. M. S., Lai, M. H. C., Yu, S., Lau, J. T. F., & Lei, M. (2017). Motives for online gaming questionnaire: Its psychometric properties and correlation with Internet gaming disorder symptoms among Chinese people. *Journal of Behavioral Addictions*, *6*(1), 11-20. https://doi.org/10.1556/2006.6.2017.007

Yee, N. (2006a). Motivations for play in online games. *CyberPsychology & Behavior*, *9*(6), 772-775. https://doi.org/10.1089/cpb.2006.9.772

Yee, N. (2006b). The demographics, motivations, and derived experiences of users of massively multi-user online graphical environments. *Presence: Teleoperators and Virtual Environments*, *15*(3), 309-329. https://doi.org/10.1162/pres.15.3.309

Yen, J. Y., Yeh, Y. C., Wang, P. W., Liu, T. L., Chen, Y. Y., & Ko, C. H. (2018). Emotional Regulation in Young Adults with Internet Gaming Disorder. *International Journal of Environmental Research and Public Health*, *15*(1), 30. https://doi.org/10.3390/ijerph15010030

Note

Note 1. The IGD items were reclassified for descriptive purposes with a rating of four or more indicative of an endorsement of that symptom IGD. Using the proposed DSM-5 cutoff for IGD diagnosis (i.e., endorsing five or more symptoms), 46 (4.75%) met the threshold for IGD of which 35 (76.09%) were classified as OP video game users.