

The role of video gaming motives in the relationship between personality risk traits and Internet Gaming Disorder

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Abstract

The main aim of this study is to improve our knowledge on Internet Gaming Disorder (IGD), contributing to a common discourse concerning its risk profiles. Specifically, the study aims to assess the prevalence of addicted gamers among Italian online and offline gamers, accounting for gender and to investigate the mediation role of gaming motives on the relationship between personality risk traits and IGD. A total of 627 videogame players (55% women; mean age 27 years) recruited from social networking sites took part in the study and filled a questionnaire including gaming characteristics, the Internet Gaming Disorder Scale (IGDS9-SF), the Substance Use Risk Profile Scale (SURPS) and the Motives for Online Gaming Questionnaire (MOGQ). The prevalence rate of Internet gaming disorder was 5.3%. Hopelessness was the personality dimension that most differentiates gaming addicts from non-addicts. Results of the mediation model suggested that Hopelessness was both directly and indirectly (via escape, fantasy and recreational motives) associated with IGD. The motivations Escape and Fantasy also mediate between Anxiety sensitivity and IGD while Competition mediate between Sensation seeking trait and IGD. The evidence suggests that IGD is motivated by psychological mechanisms similar to those compelling substance abuse, but with its own unique features.

Keywords: Internet gaming disorder, gaming motives, mediation model, personality risk traits

Résumé

Cette étude a pour but d'améliorer notre connaissance de la dépendance au jeu sur Internet (DJI) afin d'enrichir le discours sur ses profils de risque. Elle vise plus précisément à évaluer la prévalence des joueurs dépendants parmi les joueurs italiens en ligne et hors ligne, en tenant compte du genre et en examinant le rôle de médiation des raisons qui motivent la pratique des jeux dans la relation entre les traits de personnalité présentant des risques et la DJI. En tout, 627 joueurs de jeux vidéo (55 % de femmes

d'une moyenne d'âge de 27 ans) recrutés sur des sites de réseaux sociaux ont participé à l'étude et rempli un questionnaire comprenant des caractéristiques liées au jeu, l'échelle de la dépendance au jeu sur Internet (IGDS9-SF), l'échelle de profil de risque de consommation de substances psychoactives (SURPS) et le questionnaire sur les raisons de jouer en ligne (MOGQ). Le taux de prévalence de la dépendance au jeu sur Internet s'établissait à 5,3 %. Le désespoir constituait l'aspect de la personnalité qui distinguait le plus les personnes dépendantes au jeu des personnes non dépendantes. Les résultats du modèle de médiation donnaient à penser que le désespoir était associé directement et indirectement (raisons liées à la fuite, à l'imaginaire et aux loisirs) à la DJI. Les raisons Fuite et Imaginaire assurent la médiation entre la sensibilité à l'anxiété et la DJI, tandis que la concurrence assure la médiation entre la recherche de sensations et la DJI. Tout indique que la DJI est motivée par des mécanismes psychologiques similaires à ceux qui incitent à la toxicomanie, mais possède ses propres caractéristiques.

Introduction

Playing videogames has for decades been the most popular source of entertainment among young people (Šporčić and Glavak-Tkalić, 2018). In the United States (US), approximately 65% of adults (50% of men and 48% of women) play videogames regularly (Entertainment Software Association, 2019) and in the European Union (EU), videogames are highly popular across age groups (Kovess-Masfety et al., 2016), with 48% of Europeans having played digital games (Interactive Software Federation of Europe, 2012).

Although for the majority of users gaming may be harmless, and for some, may even yield cognitive, motivational, emotional, and social benefits because of its psychologically rewarding features (Hellström et al., 2012), excessive video gaming may instead produce detrimental effects on certain gamers' lives (Altintas et al., 2019; Gentile et al., 2011; Mentzoni et al., 2011). The latest *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* introduces Internet Gaming Disorder (IGD) in Section 3 ("Emerging Measures and Models") with the aim to improve consistency in the conceptualization of gaming-related problems. IGD is defined by at least 5 of the 9 criteria, over a 12-month period, referred to the gaming behaviour: preoccupation; withdrawal; tolerance; loss of interest in other activities; minimizing use; loss of relationship, educational, or career opportunities; gaming to escape or relieve anxiety, guilt or other negative mood states; failure to control and continued gaming despite psychosocial problems (American Psychiatric Association, 2013). The *DSM-5* considers IGD related to specific Internet games, also involving offline computerised games (Kuss et al., 2017).

The prevalence of the IGD is currently unclear (see Mihara and Higuchi, 2017, for a review). Previous studies, based on *DSM-5* criteria, reported the lowest prevalence

rate (0.2%) in a German population ranging from teenagers to adults (Festl et al., 2013), with young adults 21–30 (males 8.9%, females 5.1%), and middle adults 31–40 (males 5.5%, females 2.0%) (Lemmens et al., 2015). Other research has estimated IGD rates between 1.2% and 8.5% in adolescents and young adults (Király et al., 2015; Moudiab and Spada, 2019; Wartberg et al., 2017), highlighting a growing public health concern.

Scholars in the field have repeatedly outlined how understanding factors that underpin IGD is crucial for its psychopathological classification and treatment (Scerri et al., 2019). Nowadays, a large amount of research has investigated the mechanisms that lead to IGD (Kircaburun et al., 2019) concluding that personality is one of the prominent risk factors that predict the development of IGD (Gervasi et al., 2017). In addition, following Caplan and colleagues' (2009) motivation theory, Kardefelt-Winther (2014) empirically demonstrated that the gaming motivations, such as escapism and achievement, mediate the relationship between individual vulnerabilities and excessive online gaming. This result suggests that motivations for play and psychological characteristics may be usefully investigated in conjunction rather than separately. The theoretical model of *Compensatory Internet Use* represents an opportunity to combine the psychological approach with the motivations theory. This model assumes that the more individuals are psychologically vulnerable, the more they are likely to turn to online applications (i.e., video games) to compensate for their difficulties offline (e.g., Adams et al., 2019; Ballabio et al., 2017). Following this model, exploring gaming motives as mediators between psychological traits and IGD would allow us to deepen our understanding of why individuals play, by contextualizing the motivation for overuse use in the presence of personality risk factors.

Similarly to theories of substance use addiction (e.g., Biolcati & Passini, 2019; Cooper, 1994), we thus assume that gaming motives are the proximal variables to IGD through which more distal risk variables, such as personality traits, exert their influence. Therefore, research on IGD needs to consider mediation effects and the interaction of the prominent risk factors. Based on these reasons, the present study tested the direct and indirect effects of personality risk traits on IGD via gaming motives, in adult population.

Internet Gaming Disorder and personality traits

Over the last decade, a number of studies have explored the relationship between IGD and players' personality traits considered as addictive risk factors (Caplan et al., 2009; Schneider et al., 2017). Empirical studies revealed IGD to be associated with neuroticism, aggression and hostility, loneliness and introversion, social inhibition, boredom inclination, sensation-seeking, low self-esteem, state and trait anxiety, to cite a few (see Şalvarlı & Griffiths, 2019, for a review).

Previous research carried out in adult populations reported higher impulsivity levels (Aboujaoude, 2017) as well as depressive and anxiety symptoms (Mentzoni et al., 2011) in frequent Internet gamers when matched with non-frequent Internet gamers.

In addition, adult IGD patients present specific personality traits, such as impulsivity and sensation seeking (Mallorquí- Bagué et al., 2017; Mehroof and Griffiths, 2010; Norbury and Husain, 2015). A recent literature review (Gervasi et al., 2017) revealed that high neuroticism and high impulsivity appeared quite steadily as significant predictors of IGD across the studies, but the overall result of the review showed that different combinations of personality traits play a key role in the development of IGD. Similarly to substance use disorders, individuals with poorly regulated emotions often engage in maladaptive behaviors to escape from or downregulate their emotions (Estévez et al., 2017). For this reason, following the Pathways Model framework (Allami and Vitaro, 2015) serving as a stepping stone for identifying individuals who are at risk of developing a Gambling Disorder, in the present study we used the four personality profiles emerging from the Substance Use Risk Profile (SURPS; Woicik et al., 2009). Indeed, both substance-related and behavioural addictions are supposed to share common predisposing factors and may be part of an addiction syndrome (Kuss et al., 2018). The SURPS seems to be well suited for personality assessment in addiction research (Biolcati and Passini, 2019), as only relevant traits are examined with a relatively small number of items: the internalising profiles of Anxiety Sensitivity and Hopelessness, and the externalising profiles of Sensation Seeking and Impulsivity. Specifically, all four profile scales investigated by SURPS seem related to the development of profile-specific behavioural problems (Newton et al., 2016). As far as we know, the SURPS has never been used to investigate videogame players' personality traits.

IGD and Gaming Motives

Gaming motives have been a key construct in the understanding of Internet gaming, providing a framework to differentiate between gamers, in terms of gaming behaviours and IGD (Moudiab and Spada, 2019). Among online players, the motivations of achievement, social connection, and escapism are factors that are predictive of gaming addiction (Dauriat et al., 2011). Achievement is defined as the desire to gain power, progression, accumulation of in-game wealth/status, and competition. Social connection is qualified as the production of long-term meaningful relationships and teamwork. Escapism represents the avoidance from real-life concerns. Evidences show that gamers choose to play in relation to different motives, emphasising that video gaming may have different meanings and consequences for diverse players (Moudiab and Spada, 2019). A previous research on IGD (Ramos-Diaz et al., 2018) showed that escapism and fantasy were the factors that most predict IGD among players. Other research investigating gaming motives as risk factors revealed that the escape motive was the strongest predictor of IGD (e.g., Bányai et al., 2019).

Research on the mediation role of motivational factors is not new in the field of addiction studies (e.g., Biolcati and Passini, 2018). Indeed, previous results have suggested a mediating role of motivational factors in other behavioural addictions such as Internet addiction (Bischof-Kastner et al., 2014). Specifically, based on studies on alcohol use that have identified a mediator role of drinking motives between distal influences (i.e., personality traits) and drinking problems (Biolcati

et al., 2016), this study examined the assumption that there should be a link between personality risk profile and IGD via the mediation of gaming motives.

Specifically, the first goal of the present study was to explore the gamer features, the gaming characteristics and the prevalence rate of addicted gamers in a large sample of Italian online and offline gamers, accounting for gender. The second aim was to investigate the mediation role of gaming motives on the relationship between personality risk profile (stemming by SURPS) and IGD among video gamers.

Method

Participants

A total of 645 participants (women = 55.7%) aged between 18 and 58 ($M = 27.27$, $SD = 7.54$) filled in the questionnaires. A question about having ever played at videogame was asked as filter for our sample: the final number of participants was 627, corresponding to 97.2% of the total sample, while 2.8% ($n = 18$), who had never played videogames in their life, were excluded from the following analysis. The estimated maximum sampling error was 3.91% at the 95% confidence level ($Z = 1.96$).

All the subjects were Italian citizens, 345 women (55%) and 282 men (45%) from 18 to 55 years old ($M = 27$, $SD = 6.95$). With regard to qualifications, 38 (6.1%) of the sample had earned a junior high certificate, 361 (57.6%), had achieved a high school diploma, 131 (20.9%) had been awarded a bachelor's degree, 68 (10.8%) had earned a master's degree, and 29 people (4.6%) held either a specialization or PhD.

Procedure

Participants were contacted online, using an Internet questionnaire built with Google Forms, a survey-generating tool. The questionnaire was drafted in Italian and the sample was provided with a dictionary definition of "videogame" and a brief of the study. The sample was recruited by means of a *snowballing* procedure. Specifically, two final year students were asked to recruit friends, relatives, and family members to answer the questionnaire. Participants were asked to answer questions about gaming habits. The only inclusion criteria was to have played videogame once in their lives. To check and prevent anyone from re-entering the survey site, the subject's IP address was monitored. In accordance with the standard procedure for minimal-risk online surveys, the informed consent of the participants was implied through survey completion. No personal identifying information was gathered. Data were collected in 2019. This survey was conducted in agreement with the ethical norms laid down by the Italian National Psychological Association.

Measures

First, participants provided *demographics* (i.e., age, gender, relationship status and academic level) and details about *gaming characteristics* (i.e., onset age of gaming,

yearly game frequency on a 5-point Likert scale; weekly time played; daily hours played on the digital devices). Last, favourite game genres and modalities of playing (i.e., offline/online, single-hand/multiplayer game) were also collected.

The Internet Gaming Disorder Scale – Short-Form (IGDS9-SF)

The IGDS9-SF, in the Italian version validated by de Monacis and colleagues (2016), was used to assess the severity of IGD referring to either online or offline gaming activities, or both, occurring over a 12-month period. The scale has a single latent factor structure and it comprises 9 items corresponding to the 9 core criteria defined by the *DSM-5*. Answers are on a 5-point Likert scale ranging from 1 (never) to 5 (very often) and higher scores indicate a higher degree of gaming problems. The statistical validation of the IGDS9-SF Italian version resulted in a cut-off point of 21. In the present study, the IGDS9-SF had good reliability ($\alpha = .79$).

Substance Use Risk Profile Scale (SURPS)

The SURPS, constructed by Woicik and colleagues (2009), was used to assess the personality risk traits. SURPS consists of 23 items on a 4-Likert response scale from Completely Disagree to Completely Agree. The scale measures 4 underlying personality dimensions: Hopelessness (7 items, e.g., “I feel that I’m a failure,” $\alpha = .88$, it requires an inversion of respondent’s score), Anxiety Sensitivity (5 items, e.g., “It frightens me when I feel my heart beat,” $\alpha = .71$), Impulsivity (e.g., “I often don’t think things through before I speak,” $\alpha = .70$), and Sensation Seeking (e.g., “I would like to skydive,” $\alpha = .74$).

Motives for Online Gaming Questionnaire (MOGQ)

The *MOGQ* (Demetrovics et al., 2011) is a 27-item scale that covers 7 motivational factors on a 5-point Likert scale (from *almost never/never* to *almost always/always*): Sociability ($\alpha = .77$), Escape ($\alpha = .91$), Competition ($\alpha = 0.85$), Coping ($\alpha = .84$), Skill Development ($\alpha = .92$), Fantasy ($\alpha = .88$) and Recreation ($\alpha = .97$).

Results

As regards to weekly days played, 137 (21.9%) affirmed to play “every day,” while 100 (15.9%) “5–6 days” a week, 125 (19.9%) “3–4 days,” 113 (18%), “1–2 days,” 152 (24.2%) “less than weekly” (24.2%). Regarding the hours played per day, 223 (35.6%) participants play games “1–2 hours,” 162 (25.8%) “3–4 hours,” 48 (7.7%) “5–6 hours,” 8 (1.3%) “7–8 hours,” 11 (1.8%) “more than 8 hours.” Only 175 (27.8%) play “less than an hour” a day. Regarding time spent on video gaming, certain significant gender differences were found. Chi square test showed that men spend more time during the week [$\chi^2(1, N = 627) = 34.2, p < .001$; 27.7% vs. 17.1% “everyday”], and more hours in a day [$\chi^2(1, N = 627) = 19.4, p < .01$; 2.5% vs. 1.2% “more than 8 hours”] than women.

Most of the participants, 395 (63%), usually play alone, while 87 (13.9%) play with their own friends, 21 (3.3%) play with people met on the game platform sharing the same game interest, and 124 (19.8%) play both with friends and people met on game platforms. One hundred and seventy (27.1%) gamers play mainly on offline games, (computer, smartphone or tablet), 232 (37.0%) usually prefer online games on the same platforms, while most of them, 225 (35.9%), use games on console (Play Station, Xbox, etc.). Notably women showed more interest in offline games than men [$\chi^2(1, N = 627) = 65.2, p < .001$; 37.7% vs. 14.2% “offline games”], while men preferred games on console (Xbox, Play Station etc.) compared to women [$\chi^2(1, N = 627) = 65.2, p < .001$; 51.1% vs. 23.5% “games on console”]. Regarding the favourite game genres, people could give maximum 3 answers on a multiple choice of games. The most frequent choices were simulator games ($n = 270$; 17.6%), adventure games ($n = 228$; 14.8%), followed by action games ($n = 224$; 14.6%), and role playing games ($n = 202$; 13.1%).

Among the total sample, 5.3% ($n = 34$) had an IGD according to the IGDS9-SF cut-off score (> 21)¹. They were 16 women and 18 men. Chi-square found no differences regarding gender ($\chi^2(1) = .922, p = .22$).

Concerning the risk profile scale (see Table 1), ANOVA analyses showed that females have higher level of anxiety sensitivity and impulsivity, whereas men resulted more sensation seekers. With regards to motivations for gaming, men were moved more by social, competition, coping, skills and recreational motives than women. On the other side, women played games more for escapism motives than men.

A path analysis model was computed to test the mediation of motives for video gaming on the relationship between SURPS and IGD. The model was estimated using the robust maximum likelihood estimator (MLR) performed with the MPLUS 8 software program (Muthén and Muthén, 2012). For the evaluation of the model fit, we considered the comparative fit index (CFI), the Tucker-Lewis index (TLI), the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA). Consistent with the recommendation of Hu and Bentler (1999), goodness-of-fit criteria were used to quantify excellent fit ($CFI > 0.95, TLI > 0.95, SRMR < 0.08, RMSEA < 0.06$). Finally, the indirect effects and their standard errors in the model were also estimated with MPLUS by delta method (MacKinnon et al., 2002). The model was controlled for the gender of participants.

After non-statistically significant paths ($p > .05$) were trimmed from the model, final path coefficients (see Figure 1) showed that *Hopelessness* predicted *Escape*, *Fantasy* and *Recreation*; *Anxiety Sensitivity* predicted *Escape*, *Coping* and *Fantasy*; *Impulsivity* predicted *Recreation*; and *Sensation seeking* predicted *Competition* and

¹For that reason, the distribution of this variable was not normal (see Table 1). Instead, all the other variables had acceptable values of skewness and kurtosis, as they were between ± 2 (Gravetter & Wallnau, 2014).

Table 1
Means and ANOVA Differences for Gender and Internet Gaming Disorder Among Study Variables

Measures	M	SD	Ske	Kur	Gender		IGD			
					M Men (n = 282)	M Women (n = 345)	M No-IGD (n = 593)	M IGD (n = 34)	F	F
Age	27.00	6.95	-	-	28.19	26.03	27.16	24.18	15.29***	5.97*
Onset age of gaming	8.43	4.40	-	-	7.27	9.40	8.48	7.59	37.87***	1.23
Yearly game frequency (1, 5)	3.78	1.12	-	-	4.03	3.58	3.74	4.53	26.42***	16.41***
<i>SURPS</i> (1, 4)										
Anxiety Sensitivity	2.31	0.61	-0.03	-0.39	2.17	2.43	2.30	2.48	29.27***	2.88
Impulsivity	1.87	0.55	0.53	0.01	1.82	1.91	1.86	2.13	4.57***	7.98**
Sensation Seeking	2.31	0.63	-0.10	-0.55	2.45	2.20	2.30	2.46	26.15***	1.96
Hopelessness	2.13	0.62	0.76	0.62	2.05	2.20	2.10	2.62	8.95*	23.54***
<i>MOGQ</i> (1, 5)										
Social	1.81	.86	1.32	1.53	1.95	1.69	1.77	2.42	15.57***	18.75***
Escape	1.91	1.10	1.34	0.88	1.79	2.01	1.86	2.83	6.67**	26.42***
Competition	1.78	.93	1.46	1.55	2.19	1.45	1.73	2.75	115.39***	40.81***
Coping	2.44	1.07	0.40	-0.74	2.58	2.32	2.39	3.22	9.02**	19.58***
Skills	2.12	1.18	0.88	-0.38	2.40	1.90	2.07	3.04	28.6***	22.69***
Fantasy	1.88	1.09	1.26	-.65	1.84	1.92	1.84	2.63	1.035	17.48***
Recreational	3.69	1.43	-0.61	-1.22	3.96	3.47	3.67	4.11	18.33***	3.03
IGDS9-SF (9, 45)	12.72	4.46	1.94	5.12	13.24	12.29	11.98	25.65	7.12**	582.38***

Note. Ske = Skewness. Kur = Kurtosis. *SURPS* = Substance use risk profile scale. *MOGQ* = Motives for online gaming questionnaire. *IGDS9-SF* = 9-item Internet Gaming Disorder Scale SF. The numbers in parentheses represent the scale range.
 *** $p < .001$. ** $p < .01$. * $p < .05$.

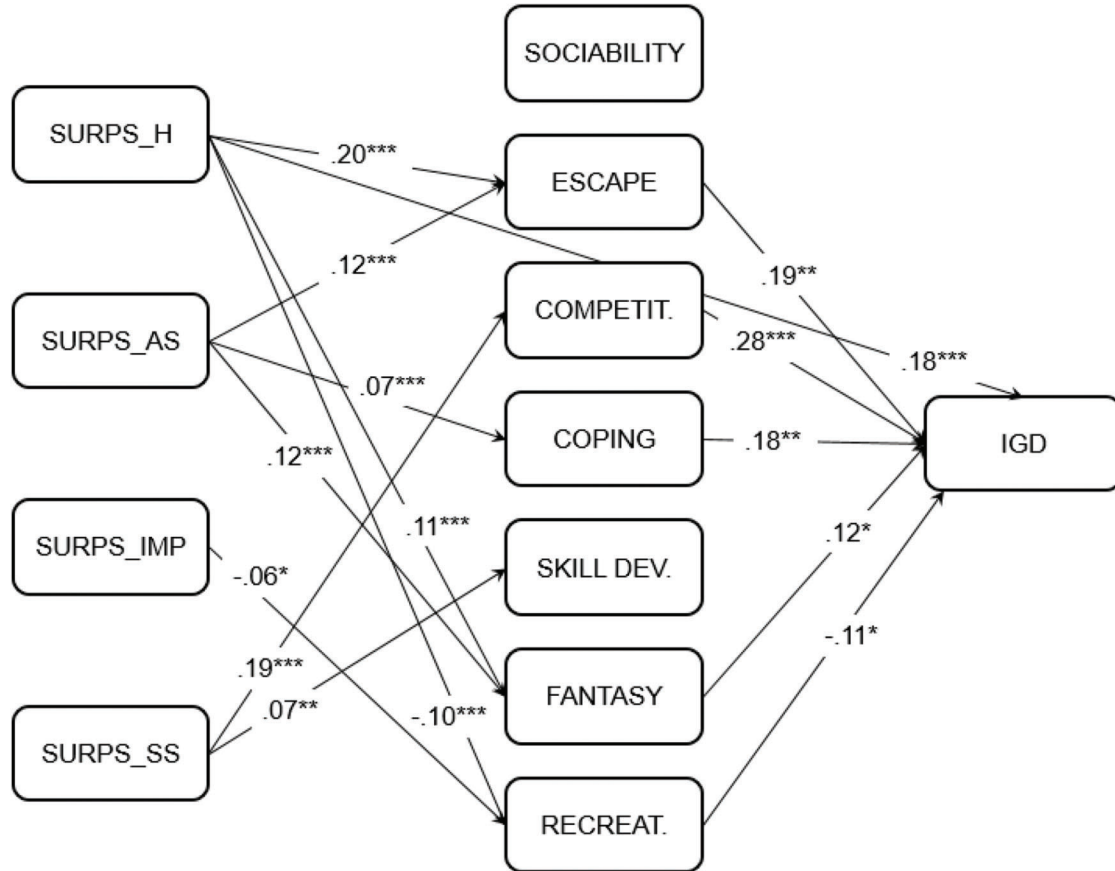
Table 2
Correlation Analysis Between Variables Among the Total Sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. IGD	—													
2. Age	-.11**	—												
3. Onset age of gaming	-.10*	.36**	—											
4. Game frequency during the year	.38**	.03	-.19**	—										
5. Anxiety sensitivity	.17**	-.24**	-.04	-.03	—									
6. Impulsivity	.19**	-.20**	.02	.01	.31**	—								
7. Sensation seeking	.09*	-.15**	-.15**	.01	.04	.23**	—							
8. Hopelessness	.23**	.00	.06	.00	.07	.04	-.22**	—						
9. Social motives	.37**	-.07	-.12**	.39**	.03	.11**	.08*	-.01	—					
10. Escape motives	.45**	-.13**	-.03	.29**	.15**	.14**	.02	.20**	.53**	—				
11. Competition motives	.40**	-.09*	-.18**	.31**	-.02	.13**	.23**	-.02	.43**	.28**	—			
12. Coping motives	.42**	-.01	-.13**	.43**	.08*	.08*	.09*	-.01	.64**	.63**	.49**	—		
13. Skills motives	.35**	-.03	-.15**	.39**	-.00	.09*	.14**	-.03	.66**	.46**	.52**	.73**	—	
14. Fantasy motives	.39**	-.15**	-.13**	.29**	.14**	.12**	.07	.11**	.51**	.68**	.26**	.54**	.49**	—
15. Recreational motives	.25**	-.02	-.12**	.42**	-.01	-.01	.07	-.11**	.52**	.42**	.43**	.72**	.54**	.45**

Note ** = $p < .01$; * = $p < .05$; IGD = Internet Gaming Disorder.

Figure 1

Path analysis of the effects of SURPS on Internet gaming disorder mediated by the motives for online gaming. Reported coefficients are standardized. H = Hopelessness. AS = Anxiety Sensitivity. I = Impulsivity. SS = Sensation seeking. Competit. = Competition. Dev. = Development. Recreat. = Recreational.



Ability. With regards IGD, this variable was predicted by *Escape*, *Coping*, *Fantasy*, *Recreation*, and directly from *Hopelessness*. *Social Motive* and *Ability* did not predict it, and the former was not predicted by any SURPS variable. Gender (Women = 0 and Men = 1) negatively predicted *Escape* and *Fantasy*, while positively *Competition*, *Ability*, and *Recreation*. The effect of Gender on IGD was not significant ($B = .05$, $p = ns$). The fit indexes of the resulting model display a good fit with $\chi^2(25) = 55.77$, $CFI = .99$, $TLI = .97$, $RMSEA = .04$, $SRMR = .05$.

Regarding the mediation effects on IGD, the indirect effects from *Hopelessness* through the mediating effects of *Escape*, *Fantasy*, and *Recreation* were significant (total indirect effect: $B = .06$, $t = 4.61$, $p < .001$); the indirect effects from *Anxiety Sensitivity* through the mediating effects of *Escape*, *Coping*, and *Fantasy* were significant (total indirect effect: $B = .05$, $t = 4.33$, $p < .001$); the indirect effects from *Sensation seeking* through the mediating effects of *Competition* were significant ($B = .05$, $t = 4.19$, $p < .001$).

Discussion

The present study had two goals: (i) to explore the gaming characteristics and the prevalence rate of addicted gamers among Italian online and offline gamers, accounting for gender; (ii) to investigate the mediation role of gaming motives on the relationship between personality risk traits and IGD. Overall, gamers reported they first played digital games at an early age (on average at eight years), and almost 40% of participants play video games regularly (more than five days a week), in accordance with previous studies (Pontes et al., 2016; Vitaro et al., 2004).

These findings confirmed the majority of studies (e.g., Mentzoni et al., 2011) stating that men are more engaged in gaming activities compared to women and they report more problems with gaming (Brunborg et al., 2013; Monacis et al., 2016). Similarly confirming previous findings in the gaming literature (i.e., Demetrovics et al., 2011), male gamers score higher on many different gaming motives, mainly competition and skills achievement, whereas female gamers score higher only on escapism. Our findings are also consistent with gender differences in risk profiles and gaming inclination (Király et al., 2015). Men generally tend to be more competitive in various settings and more sensation seekers, while women are more prone to experience negative emotions and to internalize problems returned in higher occurrence of hopelessness and anxiety, and this is in line with their higher escapism motive scores. However, it is interesting to note that males and females are equally represented in the group of players who exceed the cut-off for IGD.

Exploring IGD, using the cut-off of 21 points for diagnosis as suggested by a study on an Italian sample (Monacis et al., 2016), the prevalence rate in our sample is above the average incidence of IGD (4.7%; range 0.7–15.6%) obtained in studies on naturalistic populations (Feng et al., 2017). This result can be explained by the fact that Italy is considered a “nation of players,” ranked the tenth country worldwide for gaming revenue (de Palo et al., 2019). Specifically, distinctions between IGD and no-IGD emerged with respect to the relationship with the personality dimensions stemming from SURPS. Indeed, the IGD addicts were significantly more impulsive and hopeless than individuals not diagnosed as IGD. Indeed, unlike other studies considering SURPS dimensions as distinctive traits of psychoactive substance over-users (e.g., Biolcati and Passini, 2019), Anxiety Sensitivity and Sensation Seeking are not personality traits prominent among gaming addicts. Specifically, Hopelessness was the personality dimension that most differentiated gaming addicts from non-addicts. After all, other studies have demonstrated that depression is a relevant psychological symptom for an IGD diagnosis: individuals classified with IGD had higher rates of depressive symptoms than those without IGD, and they were more likely to report periods of hopelessness (Petry et al., 2015). Persons who consider themselves “to be a failure” and with few prospects for the future are likely to be attracted to games that allow them to escape from everyday reality, supporting the Compensatory Internet Use theory. Impulsivity has also been linked to IGD in previous studies (e.g. Aboujaoude, 2017) considering that to act for the pleasure of the activity without thinking about its consequences represents a peculiarity of the

addiction. On the other hand, unlike previous studies (e.g., Müller et al., 2016; Norbury and Husain, 2015), our findings suggested that sensation-seeking and anxiety-sensitivity traits did not discriminate between addicts and non-addicts. It is also possible that sensation seekers seek novel or arousing stimuli with the selection of other media content, such as violent and pornographic fare, rather than videogames (Krcmar and Greene, 1999), and video gaming appears not to be the favourite sedative activity for anxious people.

Moreover, in the total sample, our findings showed that Recreation was the main motive for gaming. The lack of differences on recreational motive score between addict gamers and no-addicts strengthened the belief that playing videogames for leisure and entertainment motives may be harmless. Conversely, playing videogames to escape everyday difficulties appears to be a motivating behaviour that may alleviate psychological suffering and thus extends self-medication theory to video gaming (Király et al., 2015). All the other gaming motives were significantly higher among gamers with IGD, consistently with previous studies (Laconi et al., 2017; Wittek et al., 2016).

The results of the mediation model suggested that Hopelessness was both directly and indirectly (via escape, fantasy and recreational motives) associated with IGD. Feelings of hopelessness of individuals in real life may become an inner drive for over-use of videogame playing. Certain studies have reported significant relationships between gamers' sense of loneliness and depression and problematic online games (King et al., 2010; Tonioni et al., 2012). Moreover, the motivation to escape has been found to mediate between Hopelessness and Anxiety sensitivity on one side and gaming addiction severity on the other.

The Escapism motive was shown to be a predictor of IGD, confirming previous findings (Šporčić and Glavak-Tkalić, 2018). Videogames offer a rich and complete alternative scenario, full of exciting opportunities that are particularly suitable for escapism (Castronova, 2005). Furthermore, escapism was one of the nine criteria included in DSM-5 for IGD (American Psychiatric Association, 2013). In addition, our results showed that the Fantasy motive mediates between Hopelessness and Anxiety sensitivity traits and IGD. This result is not surprising given that experiencing exciting, amazing and alternative virtual worlds may be used to avoid and forget about individual distress. Similarly to Király and colleagues (2015), we found a mediation effect of competition, but only between sensation seeking trait and IGD. Previous studies have reported that the highest level of competitiveness was found in the assiduous gamers in comparison with casual players (Jansz and Tanis, 2007) and it is likely that gamers who scored high on sensation seeking were motivated to play by experiencing intense emotions given by the challenge with others. As expected, social, and skill development motives did not play a mediating role between personality profiles and IGD.

Limitations and conclusions

Certain limitations of the present study need to be taken into account. First, regarding data collection, the participants were self-selecting and the use of a

snowballing procedure led to the recruitment of highly interconnected people, with some risk of gathering similar responses. This issue biases the generalizability of the results to the Italian adult gamer population and subsequent generalizations can only be supported by means of other studies. Second, data were self-reported, and as such, subjected to specific biases (e.g., social desirability). Then, the cross-sectional design of the present study precluded from making inferences on causal relations between the variables investigated. A further shortcoming of the study is that it did not distinguish between different game genres. More surveys are needed to deepen our knowledge about the role of specific types of games on the complex relationship between personality profile, motives and IGD. In addition, future research should also involve clinical samples to look more deeply into the issue. Moreover, despite many studies highlight that the classification of IGD as a mental health disorder is appropriate, and that the condition is a risk factor for impaired psychosocial well-being (e.g., Teng, et al., 2020), the few longitudinal studies analysing the association between IGD and psychopathology provide contradictory results and show the complexity of this relationship (see González-Bueso et al., 2018, for a review). For that reason, longitudinal studies on the natural course or history of IGD are important for future lines of search.

Despite these limitations, the present study contains certain strengths for scholars and clinicians. In line with previous research, these findings underline the pivotal role of personality traits and gaming motives (i.e., escape, fantasy, competition) for treatment and prevention. More specifically, playing to escape from daily hopelessness appears to be dangerous in terms of IGD. Similarly, competition and fantasy (i.e., experiencing new challenges and living out alternative identities through the game) are mediators in the relationship between personality and IGD. Clinicians should take into account the presence of these trait-motive combinations in playing online videogames and tailor the intervention accordingly. Regarding prevention, the results suggest that hopelessness may play an important role in predicting the possibility to develop problematic gaming. Moreover, prevention programs should be set to address the specific psychological trait. Finally, the present study examined never previously investigated personality traits stemming from substance use literature in terms of protective-risk factors, adding insights to the existing empirical research, which has already investigated relationships between personality traits and gaming addiction (e.g., Müller et al., 2014). Such an important collective finding should help to identify a more detailed profile of addicted gamers.

Taken as a whole, the present study will support research into video gaming habits in the Italian context, contributing to a common discourse concerning the diagnosis of IGD.

Specifically, the results suggest that hopelessness is an underlying risk trait of IGD and that video gaming seems a way to escape from negative emotions such as depressive states, confirming the model of compensatory Internet use. The evidence that problematic video game use is related to relief from pain suggests that pathological gaming use may be motivated by psychological mechanisms similar to

those compelling substance abuse (Hilgard et al., 2013), but with its own unique features.

References

- Aboujaoude, E. (2017). The Internet's effect on personality traits: An important casualty of the "Internet addiction" paradigm. *Journal of Behavioral Addictions, 6*, 1–4. [https://doi.org/ 10.1556/2006.6.2017.009](https://doi.org/10.1556/2006.6.2017.009)
- Adams, B. L. M., Stavropoulos, V., Burleigh, T. L., Liew, L. W. L., Beard, C. L., & Griffiths, M. D. (2019). Internet gaming disorder behaviors in emergent adulthood: A pilot study examining the interplay between anxiety and family cohesion. *International Journal of Mental Health and Addiction, 17*, 828–844. <https://doi.org/10.1007/s11469-018-9873-0>
- Allami, Y., & Vitaro, F. (2015). Pathways model to problem gambling: Clinical implications for treatment and prevention among adolescents. *Canadian Journal of Addiction, 6*(2), 13–19. [https://doi.org/ 10.1097/02024458-201509000-00003](https://doi.org/10.1097/02024458-201509000-00003)
- Altintas, E., Karaca, Y., Hullaert, T., & Tassi, P. (2019). Sleep quality and video game playing: Effect of intensity of video game playing and mental health. *Psychiatry Research, 273*, 487–492. <https://doi.org/10.1016/j.psychres.2019.01.030>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed.). Arlington, VA: Author.
- 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*, 397–408. <https://doi.org/10.1080/16066359.2017.1305360>
- Bányai, F., Griffiths, M. D., Demetrovics, Z., & Király, O. (2019). The mediating effect of motivations between psychiatric distress and gaming disorder among esports gamers and recreational gamers. *Comprehensive Psychiatry, 94*, 152117. <https://doi.org/10.1016/j.comppsy.2019.152117>
- Biolcati, R., & Passini, S. (2018). Narcissism and self-esteem: Different motivations for selfie posting behaviors. *Cogent Psychology, 5*, 1437012. <https://doi.org/10.1080/23311908.2018.1437012>
- Biolcati, R., & Passini, S. (2019). Development of the Substance Use Motives Measure (SUMM): A comprehensive eight-factor model for alcohol/drugs consumption. *Addictive Behaviors Reports, 10*, 100199. <https://doi.org/10.1016/j.abrep.2019.100199>

- Biolcati, R., Passini, S., & Mancini, G. (2016). "I cannot stand the boredom": Binge drinking expectancies in adolescence. *Addictive Behaviors Reports*, 3, 70–76. <https://doi.org/10.1016/j.abrep.2016.05.001>
- Bischof-Kastner, C., Kuntsche, E., & Wolstein, J. (2014). Identifying problematic Internet users: Development and validation of the Internet Motive Questionnaire for Adolescents (IMQ-A). *Journal of Medical Internet Research*, 16, e230. <https://doi.org/10.2196/jmir.3398>
- Brunborg, G. S., Mentzoni, R. A., Melkevik, O. R., Torsheim, T., Samdal, O., Hetland, J., Andreassen, C. S., & Palleson, S. (2013). Gaming addiction, gaming engagement, and psychological health complaints among Norwegian adolescents. *Media Psychology*, 16, 115–128. <https://doi.org/10.1080/15213269.2012.756374>
- Caplan, S., Williams, D., & Yee, N. (2009). Problematic Internet use and psychosocial well-being among MMO players. *Computers in Human Behavior*, 25, 1312–1319. <https://doi.org/10.1016/j.chb.2009.06.006>
- Castronova, E. (2005). *Synthetic worlds: The business and culture of online games*. Chicago, IL: University of Chicago Press.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, 6, 117–128. <https://doi.org/10.1037/1040-3590.6.2.117>
- Dauriat, F. Z., Zermatten, A., Billieux, J., Thorens, G., Bondolfi, G., Zullino, D., & Khazaal, Y. (2011). Motivations to play specifically predict excessive involvement in massively multiplayer online role-playing games: Evidence from an online survey. *European Addiction Research*, 17, 185–189. <https://doi.org/10.1159/000326070>
- de Palo, V., Monacis, L., Sinatra, M., Griffiths, M. D., Pontes, H., Petro, M., & Miceli, S. (2019). Measurement invariance of the nine-item Internet Gaming Disorder Scale (IGDS9-SF) across Albania, USA, UK, and Italy. *International Journal of Mental Health and Addiction*, 17, 935–946. <https://doi.org/10.1007/s11469-018-9925-5>
- Demetrovics, Z., Urbán, R., Nagygyörgy, K., Farkas, J., Zilahy, D., Mervó, B., Reindl, A., Ágoston, C., Kertész, A. & Harmath, E. (2011). Why do you play? The development of the motives for online gaming questionnaire (MOGQ). *Behavior Research Methods*, 43, 814–825. <https://doi.org/10.3758/s13428-011-0091-y>
- Entertainment Software Association. (2019, 22 January). US video game sales reach record-breaking \$43.4 billion in 2018 [Press release]. Cision: *PR Newswire*. <https://www.prnewswire.com/news-releases/us-video-game-sales-reach-record-breaking-43-4-billion-in-2018--300782449.html>

- Estévez, A., Jauregui, P., Sanchez-Marcos, I., Lopez-Gonzalez, H., & Griffiths, M. D. (2017). Attachment and emotion regulation in substance addictions and behavioral addictions. *Journal of Behavioral Addictions, 6*, 534–544. <https://doi.org/10.1556/2006.6.2017.086>
- Feng, W., Ramo, D., Chan, S., & Bourgeois, J. (2017). Internet gaming disorder: Trends in prevalence 1998–2016. *Addictive Behaviors, 75*, 17–24. <https://doi.org/10.1016/j.addbeh.2017.06.010>
- Festl, R., Scharkow, M., & Quandt, T. (2013). Problematic computer game use among adolescents, younger and older adults. *Addiction, 108*, 592–599. <https://doi.org/10.1111/add.12016>
- Gentile, D., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., & Khoo, A. (2011). Pathological video game use among youths: A two-year longitudinal study. *Pediatrics, 127*, e319–e329. <https://doi.org/10.1542/peds.2010-1353>
- Gervasi, A. M., La Marca, L., Costanzo, A., Pace, U., Guglielmucci, F., & Schimmenti, A. (2017). Personality and internet gaming disorder: A systematic review of recent literature. *Current Addiction Reports, 4*, 293–307. <https://doi.org/10.1007/s40429-017-0159-6>
- González-Bueso, V., Santamaría, J. J., Fernández, D., Merino, L., Montero, E., & Ribas, J. (2018). Association between internet gaming disorder or pathological video-game use and comorbid psychopathology: A comprehensive review. *International Journal of Environmental Research and Public Health, 15*, 668. <https://doi.org/10.3390/ijerph15040668>
- Gravetter, F., & Wallnau, L. (2014). *Essentials of statistics for the behavioral sciences* (8th ed.). Belmont, CA: Wadsworth.
- Griffiths, M. D., Davies, M. N., & Chappell, D. (2004). Online computer gaming: A comparison of adolescent and adult gamers. *Journal of Adolescence, 27*, 87–96. <https://doi.org/10.1016/j.adolescence.2003.10.007>
- Hellström, C., Nilsson, K. W., Leppert, J., & Åslund, C. (2012). Influences of motives to play and time spent gaming on the negative consequences of adolescent online computer gaming. *Computers in Human Behavior, 28*, 1379–1387. <https://doi.org/10.1016/j.chb.2012.02.023>
- 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>

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55. <https://doi.org/10.1080/10705519909540118>

Interactive Software Federation of Europe. (2012). *Videogames in Europe: 2012 consumer study*. European Summary Report. Brussels, Belgium: Ipsos MediaCT.

Jansz, J., & Tanis, M. (2007). Appeal of playing online first person shooter games. *Cyberpsychology & Behavior*, 10, 133–136. <https://doi.org/10.1089/cpb.2006.9981>

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of Internet addiction research: Towards a model of compensatory Internet use. *Computers in Human Behavior*, 31, 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>

King, D., Delfabbro, P., & Griffiths, M. D. (2010). The convergence of gambling and digital media: Implications for gambling in young people. *Journal of Gambling Studies*, 26, 175–187. <https://doi.org/10.1007/s10899-009-9153-9>

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, e88. <https://doi.org/10.2196/jmir.3515>

Kircaburun, K., Demetrovics, Z., Griffiths, M. D., Király, O., Kun, B., & Tosuntaş, Ş. B. (2019). Trait emotional intelligence and internet gaming disorder among gamers: The mediating role of online gaming motives and moderating role of age groups. *International Journal of Mental Health and Addiction*, 1446–1457. <https://doi.org/10.1007/s11469-019-00179-x>

Kovess-Masfety, V., Keyes, K., Hamilton, A., Hanson, G., Bitfoi, A., Golitz, D., & Otten, R. (2016). Is time spent playing video games associated with mental health, cognitive and social skills in young children? *Social Psychiatry and Psychiatric Epidemiology*, 51, 349–357. <https://doi.org/10.1007/s00127-016-1179-6>

Krcmar, M., & Greene, K. (1999). Predicting exposure to and uses of violent television. *Journal of Communication*, 49, 25–45. <https://doi.org/j.1460-2466.1999.tb02803.x>

Kuss, D. J., Griffiths, M. D., & Pontes, H. M. (2017). Chaos and confusion in DSM-5 diagnosis of Internet Gaming Disorder: Issues, concerns, and recommendations for clarity in the field. *Journal of Behavioral Addictions*, 6, 103–109. <https://doi.org/10.1556/2006.5.2016.062>

- Kuss, D. J., Pontes, H. M., & Griffiths, M. D. (2018). Neurobiological correlates in Internet gaming disorder: A systematic literature review. *Frontiers in Psychiatry, 9*, 166. <https://doi.org/10.3389/fpsyt.2018.00166>
- 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>
- Lemmens, J. S., Valkenburg, P. M., & Gentile, D. A. (2015). The Internet gaming disorder scale. *Psychological Assessment, 27*, 567. <https://doi.org/10.1037/pas0000062>
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83–104. <https://doi.org/10.1037/1082-989x.7.1.83>
- Mallorquí-Bagué, N., Fernández -Aranda, F., Lozano-Madrid, M., Granero, R., Mestre-Bach, G., Baño, M., Del Pino-Gutiérrez, A., Gómez-Peña, M., Aymamí, N., Menchón, J. M., & Jiménez-Murcia, S. (2017). Internet gaming disorder and online gambling disorder: Clinical and personality correlates. *Journal of Behavioral Addictions, 6*, 669–677. <https://doi.org/10.1556/2006.6.2017.078>
- Mehroof, M., & Griffiths, M. D. (2010). Online gaming addiction: The role of sensation seeking, self-control, neuroticism, aggression, state anxiety, and trait anxiety. *Cyberpsychology, Behavior, and Social Networking, 13*, 313–316. <https://doi.org/10.1089/cyber.2009.0229>
- Mentzoni, R. A., Brunborg, G. S., Molde, H., Myrseth, H., Skouverøe, K. J. M., Hetland, J., & Pallesen, S. (2011). Problematic video game use: Estimated prevalence and associations with mental and physical health. *Cyberpsychology, Behavior and Social Networking, 14*, 591–596. <https://doi.org/10.1089/cyber.2010.0260>
- Mihara, S., & Higuchi, S. (2017). Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature. *Psychiatry and Clinical Neurosciences, 71*, 425–444. <https://doi.org/10.1111/pcn.12532>
- Monacis, L., Palo, V. D., Griffiths, M. D., & Sinatra, M. (2016). Validation of the internet gaming disorder scale–short-form (IGDS9-SF) in an Italian-speaking sample. *Journal of behavioral addictions, 5*(4), 683-690. <https://doi.org/10.1556/2006.5.2016.083>
- Moudiab, S., & Spada, M. M. (2019). The relative contribution of motives and maladaptive cognitions to levels of Internet Gaming Disorder. *Addictive Behaviors Reports, 9*, 100160. <https://doi.org/10.1016/j.abrep.2019.100160>
- Müller, K. W., Beutel, M. E., Egloff, B., & Wölfling, K. (2014). Investigating risk factors for Internet gaming disorder: A comparison of patients with addictive

- gaming, pathological gamblers and healthy controls regarding the big five personality traits. *European Addiction Research*, 20, 129–136. <https://doi.org/10.1159/000355832>
- Müller, K. W., Dreier, M., Beutel, M. E., & Wölfling, K. (2016). Is Sensation Seeking a correlate of excessive behaviors and behavioral addictions? A detailed examination of patients with Gambling Disorder and Internet Addiction. *Psychiatry Research*, 242, 319–325. <https://doi.org/10.1016/j.psychres.2016.06.004>
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus statistical modeling software: Release 7.0*. Los Angeles, CA: Muthén & Muthén.
- Newton, N. C., Barrett, E. L., Castellanos-Ryan, N., Kelly, E., Champion, K. E., Stapinski, L., & Teesson, M. (2016). The validity of the substance use risk profile scale (SURPS) among Australian adolescents. *Addictive Behaviors*, 53, 23–30. <https://doi.org/10.1016/j.addbeh.2015.09.015>
- Norbury, A., & Husain, M. (2015). Sensation-seeking: Dopaminergic modulation and risk for psychopathology. *Behavioural Brain Research*, 288, 79–93. <https://doi.org/10.1016/j.bbr.2015.04.015>
- Petry, N. M., Rehbein, F., Ko, C. H., & O'Brien, C. P. (2015). Internet gaming disorder in the DSM-5. *Current Psychiatry Reports*, 17, 72. <https://doi.org/10.1007/s11920-015-0610-0>
- Pontes, H. M., Macur, M., & Griffiths, M. D. (2016). OR-85: Construct validity and preliminary psychometric properties of the Internet Gaming Disorder Scale Short-Form (IGDS9-SF) among Slovenian youth: A nationally representative study. *Journal of Behavioral Addictions*, 5(S1), 35–36. <https://doi.org/10.1556/2006.5.2016.042>
- J. Ramos-Diaz, R. Ramos-Sandoval, O. Király, Z. Demetrovics and M. D. Griffiths, “An Exploratory Study on Motivational Predictors in Internet Gaming Disorder Among Peruvian Gamers,” 2018 IEEE Sciences and Humanities International Research Conference (SHIRCON), Lima, 2018, pp. 1-4. <https://doi.org/10.1109/SHIRCON.2018.8593048>
- Şalvarlı, Ş. İ., & Griffiths, M. D. (2019). Internet gaming disorder and its associated personality traits: A systematic review using PRISMA guidelines. *International Journal of Mental Health and Addiction*, 1–23. <https://doi.org/10.1007/s11469-019-00081-6>
- Scerri, M., Anderson, A., Stavropoulos, V., & Hu, E. (2019). Need fulfilment and Internet gaming disorder: A preliminary integrative model. *Addictive Behaviors Reports*, 9, 100144. <https://doi.org/10.1016/j.abrep.2018.100144>

Schneider, L. A., King, D. L., & Delfabbro, P. H. (2017). Family factors in adolescent problematic Internet gaming: A systematic review. *Journal of Behavioral Addictions*, *6*, 321–333. <https://doi.org/10.1556/2006.6.2017.035>

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*, article 4. <https://doi.org/10.5817/CP2018-1-4>

Teng, Z., Pontes, H. M., Nie, Q., Xiang, G., Griffiths, M. D., & Guo, C. (2020). Internet gaming disorder and psychosocial well-being: A longitudinal study of older-aged adolescents and emerging adults. *Addictive Behaviors*, *110*, 106530. <https://doi.org/10.1016/j.addbeh.2020.106530>

Tonioni, F., D'Alessandris, L., Lai, C., Martinelli, D., Corvino, S., Vasale, M., Fanella, F., Aceto, P., & Bria, P. (2012). Internet addiction: Hours spent online, behaviors and psychological symptoms. *General Hospital Psychiatry*, *34*, 80–87. <https://doi.org/10.1016/j.genhosppsych.2011.09.013>

Vitaro, F., Wanner, B., Ladouceur, R., Brendgen, M., and Tremblay, R. E. (2004). Trajectories of gambling during adolescence. *Journal of Gambling Studies* *20*, 47–69. <https://doi.org/10.1023/B:JOGS.0000016703.84727.d3>

Wartberg, L., Kriston, L., & Thomasius, R. (2017). The prevalence and psychosocial correlates of Internet gaming disorder: Analysis in a nationally representative sample of 12-to 25-Year-Olds. *Deutsches Ärzteblatt International*, *114*, 419–424. <https://doi.org/10.3238/arztebl.2017.0419>

Wittek, C. T., Finserås, T. R., Pallesen, S., Mentzoni, R. A., Hanss, D., Griffiths, M. D., & Molde, H. (2016). Prevalence and predictors of video game addiction: A study based on a national representative sample of gamers. *International Journal of Mental Health and Addiction*, *14*, 672–686. <https://doi.org/10.1007/s11469-015-9592-8>

Woicik, P. A., Stewart, S. H., Pihl, R. O., & Conrod, P. J. (2009). The substance use risk profile scale: A scale measuring traits linked to reinforcement-specific substance use profiles. *Addictive Behaviors*, *34*, 1042–1055. <https://doi.org/10.1016/j.addbeh.2009.07.001>

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