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Factors associated with the problematic use of video games in adolescents and young people

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Abstract:	The aim of this study is to identify which factors are associated with the problematic use of video game play in adolescents and young people. Data were collected from a stratified random sample (N =2173) of students aged 12 to 22 (M =15.33 years old) in high school and professional training in the city of Madrid. A stepwise hierarchical linear regression analysis was performed to identify the factors that predict more problematic use. Engagement in the game and cognitive distortions explain 59.3 % of total variance in the scores on the IGDS9-SF. General mental health, gender, and age add only 1.3 % to the total explained variance. This study suggests that problem awareness, engagement in the game and cognitive distortions play a fundamental role in the problematic use of video games and, therefore, must be taken into account in the development of preventative and therapeutic programs.
Response to Reviewers:	We submit a newly revised version of our manuscript including the changes suggested in the Reviewers' comments. Responses to reviewers Reviewer #1: Thank you for the opportunity to review this paper. The authors have addressed previous reviews well. However, there are still some issues surrounding

	spelling and grammar. This paper should be edited thoroughly prior to official publication. Spelling and grammar have been checked by a professional translation service. Reviewer #2: Apologies if I was not clear about why I would like to see the text of the survey made available on a place like OSF. Let me try to clarify. My main concern is that there is very little information about the measures used in the survey. While some of these are described in the independent and dependent measures section, most are not. I have no idea which questions were asked about attitudes towards video games, or which self-control/impulsiveness scale was used. The cognitions scale was modified based on previous work, and some items are described, but not all. It is pretty standard in manuscripts to give enough detail so that a reader can replicate the study. I would not be able to do this on this study, and going to gamertest gives me a website where I have to work through the survey to see the questions. This is not ideal for other researchers who wish to replicate the study, or base their work on this study. So in my opinion, if the authors are to rely on their own website, then I think they need to include more information in the paper about the measures so that the study is replicable. Or, putting the text into a document on OSF (or similar permanent repository) would also suffice. Hopefully my explanation makes my concerns more clear now. Thank you for clarifying that this is a stepwise model. The adjustment to the table title helps. Measures used in the survey have been added to a document on OSF as suggested by Reviewer 2.

Factors associated with the problematic use of video games in adolescents and young people

Running head: Factors associated with the problematic use of video games

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Running head: Factors associated with the problematic use of video games

Abstract

The aim of this study is to identify which factors are associated with the problematic use of video game play in adolescents and young people. Data were collected from a stratified random sample (*N*=2173) of students aged 12 to 22 (*M*=15.3 years old) in high school and professional training in the city of Madrid. A stepwise hierarchical linear regression analysis was performed to identify the factors that predict more problematic use. Engagement in the game and cognitive distortions explain 59.3 % of total variance in the scores on the IGDS9-SF. General mental health, gender, and age add only 1.3 % to the total explained variance. This study suggests that problem awareness, engagement in the game and cognitive distortions play a fundamental role in the problematic use of video games and, therefore, must be taken into account in the development of preventative and therapeutic programs.

Key words: risk factors; predictors; video game play; Internet Gaming Disorder; adolescents; young people.

Video game play (VGP) in adolescents and young people is causing great social alarm; studies on the prevalence of problems associated with VGP show disparate figures, most of which are alarming. A recent meta-analysis estimates that the prevalence of Internet Gaming Disorder (IGD) is between 0.7 % and 15.6 % (Feng et al., 2017). This social alarm, as well as the disparity in figures with regard to the presence of problems with VGP is caused, in part, by a lack of precise references as to when these VGP behaviors are "normal" and when they are not.

The DSM-5 (APA, 2013) attempts to shed light on the subject by including IGD as a condition for further study, and lays out nine criteria for its identification: (1) preoccupation with Internet games; (2) withdrawal symptoms; (3) tolerance; (4) failure in attempts to control participation in Internet games; (5) loss of interest in prior hobbies and life activities as a result of, and with the exception of, Internet games; (6) continued excessive use of Internet games even with the knowledge of the psycho-social problems they entail; (7) the person has lied to family members, therapists, or other people about their Internet game usage; (8) the use of Internet games as a way to escape or relieve negative moods; and (9) the person has risked or lost significant personal relationships, work, and educational or professional opportunities due to their participation in Internet games. To diagnose IGD, at least five of the nine criteria must be met in a 12-month period, although levels of severity are not established according to the number of criteria met.

The engagement of adolescents and young people in VGP has been associated with negative personal, family, and/or social consequences such as problems sleeping (Lam, 2014), impact on their wellbeing (Scott and Porter-Armstrong, 2013), higher

rates of mental illness, and a lesser degree of self-control (Dinh et al., 2013). However, despite the social alarm, in most cases VGP is a normal hobby, and only becomes a health issue requiring professional help in a small number of players. Thus, it would be of great interest to identify which factors may facilitate or cause the problematic use of VGP or may be associated with said use. It seems necessary to go beyond the symptomatic description and characterization of the adolescent and young people that use, abuse or show pathological behaviors related to video games. Identifying why they play and factors associated with the development of an IGD will help facilitate preventive and therapeutic tasks in this regard.

Risk factors associated with problematic videogame use

Of the factors that facilitate or cause VGP problems, those most frequently mentioned are sociodemographic factors, patterns in video game use and psychopathological symptoms.

The study of why a psychological disorder develops usually begins with the analysis of sociodemographic variables. In this case, all studies coincide in finding that men play video games more than women and present more problems associated with VGP (Merelle et al., 2017; Müller et al., 2015; Rehbein et al., 2015; Van Rooij et al., 2015). Many of these studies even signal this higher frequency as a risk factor (Hyum et al., 2015; Kirkaburun and Griffiths, 2018; Mentzoni et al., 2011; Rehbein et al., 2010; Rehbein and Baier, 2013; Stockdale and Coyne, 2018; Wartberg et al., 2017). Results related to age are less conclusive: although some studies indicate that younger players have a higher risk of addiction or problematic use (Hyum et al., 2015; Mentzoni et al., 2011), the different ages considered can make it difficult to establish precise differences.

Apart from the sociodemographic variables, it is common to study patterns of play. In this regard, video game play time is one of the factors that is most frequently associated with VGP problems (Donati et al., 2015; Gentile et al., 2011; Hussain et al., 2012). However, Donati et al. (2015) indicate that the problematic use of video games is not only related to longer play time, but also to a broader range of types of video games played. Additionally, some types of video games have been associated with greater problems, especially massively multiplayer online role-playing games (MMORPGs) (Mentzoni et al., 2011; Mößle and Rehbein, 2013; Rehbein et al., 2010), followed by shooter games (Mößle and Rehbein, 2013). MMORPG is a videogame that combines aspects of a role-playing video game and a massively multiplayer online game. The player assumes the role of a character and takes control over many of that character's actions. MMORPGs are distinguished by the number of players able to interact together, and by the game's persistent world which continues to exist and evolve while the player is offline and away from the game.

Problems with videogames have also been repeatedly associated psychopathological symptoms. Thus, studies have indicated that problematic VGP may be related to higher levels of anxiety and depression (Gentile et al., 2011; Hyun et al., 2015; Mentzoni et al., 2011; Stockdale and Coyne, 2018; Wartberg et al., 2017); higher scores for psychiatric symptoms (Király et al., 2017), or lower scores for overall mental health (Stockdale and Coyne, 2018).

A special line has focused on cognitive aspects, given their importance in related problems such as Pathological Gaming. A few studies have addressed the cognitive aspects associated with VGP (Forrest, King and Delfabbro, 2017; King and Delfabbro, 2014, 2016; Marino and Spada, 2017; Moudiab and Spada, 2019). In this regard, King and Delfabbro (2016) found a higher presence of maladjusted beliefs in adolescents

with problematic game use. They suggested that the level of persistence, specificity, intrusiveness and intensity of cognitions were likely to influence the degree to which an individual is at risk of gaming problems. These types of thoughts may underlie persistent, excessive engagement in VGP activities.

Precisely this greater engagement in VGP has not been thoroughly addressed in risk factor studies, although there are studies that consider it to be "a psychological state that triggers due to two way interactions between the consumer and videogame product, which generates different levels of consumer engagement states (cognitive, affective and behavioral)" (Abbasi, Ting and Hlavacs, 2017). Engagement in VGP could be a determinant variable in which different factors are at play, especially cognitive factors and dysfunctional coping. Thus, for example, low academic self-concept could lead an individual to compensate their need for self-esteem by becoming involved in and being the best at VGP, or by trying to compensate for their failures in the real world through game playing (Mößle and Rehbein, 2013). Furthermore, few studies have tried to determine if excessive players recognised the problematic nature of their involvement in videogames. In this sense, Haagsma et al. (2012) showed that only 16.7% of excessive gamers are aware of their problematic behavior, and similarly Männikkö et al. (2017) found that only those who are at risk of becoming more severely dependent on gaming actually perceived themselves as having a problem.

Study objectives

In accordance with this review of the literature, the objective of this work is to identify which factors are associated with the problematic use of VGP in adolescents and young people. To that end, the study considers factors highlighted in the literature: such as sociodemographic factors, pattern of play, psychopathological symptoms, and

maladapted cognitions. It also includes other less thoroughly studied aspects such as players' problem awareness and engagement with videogames.

It is expected that adolescents and young people with a problematic use of VGP will more likely be: (a) men, (b) of a younger age, (c) with a higher number of hours of play per week, (d) that play more types of video games, (e) with a preference for massively multiplayer online (MMO) or shooter games, (f) who have lower scores on general mental health, (g) with higher scores at maladapted cognitions, and (h) more greatly engaged with videogames.

Material and Methods

Participants

The sample was selected using stratified random sampling at schools in the city of Madrid. Data on the student population for the city's 21 districts – their age, school year and type of schooling (public school, private school and state subsidized school) – were retrieved from the website of the city government's statistics service. Then a stratified representative sample was derived matching the distribution of students by districts, type of school, and school year from 12 years old (first course of mandatory secondary education) to 18 years old (second course of high school or professional training). Three quarters of the participants (2173 out of 2887) played video games. As can be seen in Table 1, the final sample analyzed in this study was made up of 2173 students from 38 schools in the city of Madrid, with an average age of 15.35 years old (*SD*=2.69), with a range between 12 and 22 years old, of which just over half were male. The most commonly played games were, in order, action and adventure, strategy, sports, shooters, and MMO; the preferred genre of game was action and adventure. The preferred devices

for playing were video game consoles and smartphones. The preferred place to play was largely at home, and students generally preferred to play alone.

ADD TABLE 1

Measures

Gamertest is an expert online system to detect the problematic use of video games which consists of eight sections: (1) demographic data; (2) video game habits; (3) level of risk of problems with VGP; (4) engagement in the game; (5) attitudes towards videogames; (6) cognitions on video games; (7) level of self-control/impulsiveness; and (8) general mental health (Labrador et al., 2021). The complete instrument can be located at the following website: http://www.famgi14.es/gamertest/index.html. Below the variables used in this study are described.

Independent variables

Sociodemographic data. Gender and age in years.

Variables related to video game use. Play time per week (coded into two categories: 30 or more hours a week, less than 30 hours a week), number of different types of video games played, preference for MMO games, and preference for shooter games.

General Mental Health. The General Health Questionnaire (*GHQ-12)* (Goldberg and Williams, 1988) was used; this is a self-administered screening instrument to detect psychological morbidity and possible psychiatric disorders in primary care or the general population. This instrument has been translated to more than 11 languages (Werneke et al., 2000) and is the instrument recommended for use on health surveys (McDowell, 2006). The psychometric properties of the GHQ-12 have been analyzed in adolescents in Spain (López-Castedo and Fernández, 2005). The

questionnaire consists of 12 items that are answered on a four-point Likert-type scale (from 0 to 3). The internal consistency of the scale was α = .80.

Cognitions. To assess possible cognitive distortions related to VGP, a scale was created based on the work of King and Delfabbro (2016). The scales consisted of 16 items which assessed the content of the player's thoughts in four different situations: a) what they think when they are doing another activity (i.e. "I wish I were playing right now"); b) what they think when they make a mistake (i.e. "This game or these rivals can't handle me, I won't stop until I win"); c) what they think when they are playing well (i.e. "I'm really good and I feel good"); and d) what they think when their parents or someone around them asks them to interrupt or stop playing (i.e. "I think that people who don't play video games don't understand me"). The frequency of these thoughts was assessed on a five-point Likert scale (0 = Never; 1 = Hardly ever; 2 = Sometimes; 3 = Often; 4 = Always). The range of scores was from 0 to 64. The internal consistency of the scale was α = .92.

Problem awareness and engagement in videogames.A scale was created which consisted of five elements ("How often do you play for more time than you had planned?;" "How often have you lost track of time while you were playing?;" "Do you think your video game playing behavior is problematic?;" "Do people important to you view your video game playing behavior as problematic?;" "How many times have you not been able to meet up with friends because you were playing video games?") which were assessed using a five-point Likert scale (0 = Never; 1 = Hardly ever; 2 = Sometimes; 3 = Often; 4 = Always). The range of scores was from 0 to 20. The internal consistency of the scale was α = .76.

Dependent variable

Problematic video game use was assessed using the Internet Gaming Disorder Scale Short Form (IGDS9-SF).This is a brief, nine-item instrument that covers the nine diagnostic criteria of the DSM-5, developed by Pontes and Griffiths (2015). The original instrument in English has been translated to and validated in ten languages: Portuguese (Pontes and Griffiths, 2016), Slovenian (Pontes et al., 2016), Italian (Monacis et al., 2017), Persian (Wu et al., 2017), Turkish (Evren et al., 2018), Polish (Schivinski et al., 2018), Chinese (Yam et al., 2019), German (Montag et al., 2019), Malay (T´ng and Pau, 2020) and Spanish (Beranuy, et al., 2020; Sánchez-Iglesias et al. 2020). The purpose of the instrument is to assess the severity of IGD and its harmful effects, evaluating online and offline gaming activities carried out in the last 12 months. The responses for each item are on a five-point Likert scale (1 = Never; 2 = Hardly ever; 3 = Sometimes; 4 = Often; 5 = Very Often). The instrument's scores range between 9 and 45; higher scores indicate a greater presence of problematic gaming behavior. Cronbach's alpha for this instrument was .80.

Procedure

Five independent evaluators with psychology degrees were trained to correctly administer the assessments through Gamertest. Schools were divided into groups by district and type of school, and randomly ordered. Then, for each district and type of school, the first school on the list was contacted through a detailed letter, with a follow-up call soon thereafter, and asked to provide access to the entire set of classes required for the district. If the school refused, the next school on the list was contacted. The time of year the request was made, towards the end of the school year, was a common reason schools refused to collaborate. Once a school agreed to participate in the study, the evaluators delivered informed consent forms for the children's parents/guardians and a date was set for the evaluator to visit the school to perform the assessment in the classes

that had been chosen using the stratified random sampling. After collecting the informed consent forms from the parents/guardians, the assessments were administered in groups on computers in each school's computer room, allowing approximately 30-40 minutes for students to complete them. The participants' responses were anonymously collected and coded directly in the computerized database.

Ethical issues for this study have been audited by the ethics committee of the Universidad Complutense de Madrid's School of Psychology.

Statistical Analysis

Descriptive statistics were calculated for the sociodemographic and video game usage data. The relationship between scores on the IGDS9-SF and quantitative variables (i.e. age, number of genres played, engagement, cognitions, and GHQ score) was analyzed through correlations and with dichotomous variables (or dichotomized, i.e., play time per week, preference for MMO games over others, preference for shooter games over others) through Student's *t*, using Cohen's *d* to estimate effect size. The variables that showed a significant bivariate relationship (p<.050) with the dependent variable were included in a stepwise hierarchical linear regression model.

Results

Correlations between Age, Number of Video-games Genres, Psychological Factors, and IGDS9-SF Scores

All of the variables analyzed showed significant correlations (p< .001 and p = .001 for age) with the IGDS9-SF scores (Table 2). Engagement in the game was the variable that shared the greatest variance with the dependent variable, r = .72, accounting for almost 52 % of the variance in IGDS9-SF scores (r^2 = .518), closely followed by cognitions (r^2 = .485). Two other variables accounted for some of the IGD9-SF scores variance,

number of video-games genres, and GHQ-12 scores (both r^2 = .03). The variable that shared the least variance was age, showing a significant but negligible negative correlation, r = -.07 (r^2 = .005).

ADD TABLE 2

Comparison of Gender and Gaming on IGDS9-SF Scores

As can be seen in Table 3, significant differences were also found in all of the variables evaluated. Significantly higher scores were found on the IGDS9-SF in male participants (this variable had the largest effect size, d = .88), in those who played more than 30 hours a week (d = .83), in those who preferred to play MMO games (d = .63), and those who preferred shooter games (d = .48).

ADD TABLE 3

Risk Factors for Problematic Internet Gaming Use

The significant variables in the bivariate relationships were entered into a stepwise multiple linear regression analysis. We checked that the residuals of the regression were normally distributed via histogram and Q-Q plot. We also checked for homoscedasticity; there was no discernible pattern in a scatterplot of residuals versus predicted values. The abscense of multicollinearity was assessed checking Variance Inflation Factor (VIF); all the VIFs were 2.0 or lower. As shown in Table 4, engagement with video games was entered into the regression in the first step, accounting for 51.6 % of variance (R^2= .516, p< .001) in IGDS9-SF scores. In the second step, cognitions were added to the model, and the addition of this variable explained an additional 7.7 % (ΔR^2= .077) of variance. The variables entered in the

following steps increased the variance explained to 60.6 %: GHQ-12 scores (ΔR^2= .006), age (ΔR^2= .004), and gender (ΔR^2= .003).

ADD TABLE 4

Discussion

To the authors' knowledge, this is the first study that incorporates the combination of awareness of problem, engagement in videogames and maladapted cognitions into the study of factors associated with the problematic use of video games, these factors explained the greatest percentage of variance.

Awareness of problem and engagement in the game assessed whether the person thought that: they had problems controlling play time; they lost track of time while playing; they had problems with VGP; other people close to them though that; and/or if VGP led them to isolate themselves socially. This factor was essential to explaining the problematic use of video games in our sample. Adolescents and young people who showed higher scores on problem awareness and engagement in the games scored higher in problematic use of videogames. Though, according to Männikkö et al. (2017) only a minority of gamers area aware of their problematic involvement, the fact that they show higher scores of problem awareness and engagement in videogames may indicate the presence of severe symptomatology (e.g. Internet Gaming Disorder). The hypothesis is also confirmed in that adolescents and young people who present maladapted thoughts with regard to VGP have a greater probability of problematic video game use. These results are consistent with previous findings (King and Delfabbro, 2016), which indicated that adolescents with IGD showed more maladapted thoughts on VGP than those who did not have IGD. In our study, problem awareness,

engagement in the game and cognitive distortions alone were able to explain 58.6 % of total variance in IGDS9-SF scores and, therefore, must play a fundamental role in the therapeutic process.

Despite their importance and significance, general mental health, gender and age explained only 1.3 %of total variance. Other studies indicate that psychiatric symptoms (Király et al., 2017) or higher levels of anxiety and depression (Gentile et al., 2011; Hyun et al., 2015; Mentzoni et al., 2011; Stockdale and Coyne, 2018; Wartberg et al., 2017) have greater explanatory power. This study coincides with previous research (Mößle and Rehbein, 2013), which indicate that this may be an indirect effect in which the presence of lower scores on general mental health could be the result of the interaction of other factors or a consequence of IGD. However, as this is a cross-sectional study, we cannot establish conclusions.

Regarding gender and age, our results are similar to the literature, in that they find that men are more likely to present problematic video game use (Hyum et al., 2015; Kirkaburun and Griffiths, 2018; Mentzoni et al., 2011; Rehbein et al., 2010; Rehbein and Baier, 2013; Stockdale and Coyne, 2018; Wartberg et al., 2017); and to the results from some studies that indicate that younger people are at greater risk of developing problems with VGP. Although gender and age are not the most relevant factors, they are variables that should be considered to focus preventative policies on these sectors of the population.

The initial hypotheses were not confirmed for the rest of the variables studied. Although play time, number of genres played, and preference for certain game types appeared in the correlation analyses and were associated with problematic use, they were excluded in the regression analysis.

The fact that play time is not a determinant variable of problematic use confirms the results of Király et al. (2017), which question the idea that playing video games is essentially problematic and indicate that play time in and of itself is not a factor that explains problematic use. With regard to the types of genres, there is a large variety of classifications in the literature and therefore it is difficult to compare the results from different studies; however, MMORPG games are singled out as a type of game that may have a higher risk level (Mentzoni et al., 2011; Mößle and Rehbein, 2013; Rehbein et al., 2010). In our study, the games included in this category are only MMOs, and sometimes it is difficult for both researchers and players to include a specific game in one category or another, because in some cases they are not exclusive, and because new games and genres are continually coming onto the market.

This study has several limitations. Firstly, it is not possible to show causality because a cross-sectional design was used. Second, the participants self-reported their gaming behavior, which could have resulted in at least partly flawed answers (e.g., social desirability bias, lack of introspection). Finally, even if the design of the present study did rely on a randomly selected sampling, the sample studied may not be representative of the entire population.

Conclusions

The results of this study suggest that the fundamental variables to explain the problematic use of video games are, first, problem awareness and engagement in the game and, second, cognitions associated with VGP. Other factors that played a relevant, although less important role were: a lower score on general mental health, being male and being younger.

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Compliance with Ethical Standards

Conflict of interest. None of the authors has a conflict of interest to declare.

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Table 1. *Demographic and Gaming Characteristics on the Whole Sample (N = 2173)*

	M	*SD*
Age (years)	15.3	2.7
Video-gaming hours / day	3.4	2.0
	N	%
Male	1547	71.2
Preference device	*N*	%
Console	712	32.8
Smartphone	655	30.1
Computer	455	20.9
TV	196	9.0
Tablet	155	7.1
Use of video-game type	*N*	%
Action/Adventure	1427	65.7
Sports	1017	46.8
Shooters	913	42.0
Massively Multiplayer Online	884	40.7
Vehicle simulation	770	35.4
Platform	627	28.9
Simulation	583	26.8
Fighting	517	23.8
Puzzles and boards	513	23.6
Strategy	406	18.7
Role playing	376	17.3
Rhythm	267	12.3
Gambling	244	11.2

Table 2. C*orrelations Between Age, Number of Video-Game Genres, Engagement in videogames playing, cognitions and IGDS9--SF Scores*

Variable	*M*	*SD*	1	2	3	4	5	6
1. IGDS9-SF	15.8	5.6	-					
2. Age	17.4	6.3	-.07**	-				
3. Number of video-games genres	3.9	2.5	.17**	.15**	-			
4. Engagement in video-game playing	5.6	3.4	.72**	-.03	.19**	-		
5. Cognitions	17.7	11.1	.70**	-.01	.24**	.69**	-	
6. GHQ12 scores	4.7	2.8	.18**	.09**	.04	.12**	.09**	-

Notes: $N = 2173$. **$p < .01$.

Table 3. *Comparison of Gender and Gaming Variables on IGDS9-SF Scores*

	IGDS9-SF score		
Variables	*M* (*SD*)	*t**	*d*
Gender			
Male	17.4 (6.3)	13.58	.88
Female	13.5 (5.1)		
Use of games			
Hours/week			
>30	22.1 (7.8)	7.48	.83
<30	16.1 (6.1)		
Genre preference MMO			
Yes	18.4 (6.7)	7.32	.63
No	15.8 (6.1)		
Genre preference shooter			
Yes	17.6 (6.3)	7.32	.48
No	16.1 (6.2)		

Note: MMO = Massively Multiplayer Online.
*All *p*s< .001

Table 4. *Hierarchical multiple regression model of demographics, gaming and psychological factors predicting IGDS9-SF scores. Stepwise method.*

Variable	*B*	*SE B*	B	R^2	ΔR^2
Step 1				.521	.521**
Constant	9.10**	0.16			
Engagement with video-games	1.20**	0.02	.72**		
Step 2				.600	.079**
Constant	8.10**	0.16			
Engagement with video-games	0.75**	0.03	.45**		
Cognitions	0.20**	0.01	.39**		
Step 3				.608	.008**
Constant	7.34**	0.19			
Engagement with video-games	0.74**	0.03	.44**		
Cognitions	0.20**	0.01	.39**		
GHQ-12	0.18**	0.03	.09**		
Step 4				.611	.004**
Constant	9.23**	0.46			
Engagement with video-games	0.73**	0.03	.44**		
Cognitions	0.20**	0.01	.39**		
GHQ-12	0.20**	0.03	.10**		
Age	-0.13**	0.03	-.06**		
Step 5				.616	.005**
Constant	10.97**	0.57			
Engagement with video-games	0.72**	0.03	.43**		
Cognitions	0.19**	0.01	.37**		
GHQ-12	0.23**	0.03	.11**		
Age	-0.15**	0.03	-.07**		
Gender	-0.93**	0.18	-.08**		
Step 6				.617	.001*
Constant	10.81**	0.58			
Engagement with video-games	0.71**	0.03	.43**		
Cognitions	0.19**	0.01	.37**		
GHQ-12	0.23**	0.03	.12**		
Age	-0.15**	0.03	-.07**		
Gender	-0.90**	0.18	-.07**		
Genre preference MMO	0.47*	0.20	.03*		

Note. MMO = Massively Multiplayer Online.*p< .05. **p< .001.

Authorship & Disclosure Form

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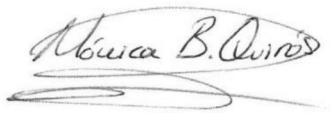

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