

Attachment and emotion regulation in substance addictions and behavioral addictions

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Background: Risky behaviors have been related to emotional regulation and attachment, which may constitute risk factors for developing an addictive behavior. However, there may also be differences between substance and non-substance-related addictions. **Aims:** This study aimed to examine the relationship of emotional regulation and attachment, with substance (alcohol and drug abuse), and non-substance-related addictions (gambling disorder, video game addiction, and problematic Internet use) in adolescents and emerging adults. The study also aimed to examine gender differences for such predictors. **Methods:** The sample comprised 472 students aged 13–21 years recruited from high schools and vocational education centers. **Results:** Findings demonstrated that emotion regulation was predictive of all addictive behaviors assessed in this study (alcohol and drug abuse, gambling disorder, video game addiction, and problematic Internet use), whereas attachment predicted non-substance-related addictions (gambling disorder, video game addiction, and problematic Internet use). In addition, gender differences were found, with females scoring significantly higher in maternal and peer attachment, whereas males scored significantly higher in gambling disorder and video game addiction. **Conclusion:** The findings may be useful for preventive and clinical interventions conducted with youth regarding addictive behaviors.

Keywords: addiction, emotion regulation, attachment, behavioral addictions, substance addictions, alcohol

INTRODUCTION

Scientific research examining addiction has traditionally focused on substance abuse. However, over the past two decades, there has been increasing research into non-substance behavioral addictions (Demetrovics & Griffiths, 2012; Grant, Potenza, Weinstein, & Gorelick, 2010; Griffiths, 2017; Griffiths, King, & Demetrovics, 2014). For instance, playing video games is an activity that when taken to excess and starts to become problematic has been viewed by many scholars as a type of behavioral addiction (e.g., Griffiths, Kuss, & King, 2012), with dysfunctional psychological symptoms (Kuss & Griffiths, 2012). The growth of video game playing among young people and adolescents has led some scholars to question the role of social games as gateway activities for gambling engagement (Griffiths, 2015). Similarly, it has been suggested that the prevalence of gambling disorder among adolescents is rising (Calado, Alexandre, & Griffiths, 2017). One of the causes for such growth might be the adoption and popularization of online gambling, which has increased the availability and accessibility of gambling products (Canale, Griffiths, Vieno, Siciliano, & Molinaro, 2016).

Although adolescent gambling disorder is difficult to determine, due to the fact that minors are prohibited from gambling in most countries, recent studies have found that

gambling disorder is prevalent among this age group, and that adults with gambling problems frequently claim they initiated their gambling behavior before reaching the legal age for gambling (Calado et al., 2017; Molinaro et al., 2014). In particular, online gambling has had an impact on the onset of gambling among those aged 10–15 years (Baysinger & Gianessi, 2015; Canale et al., 2016). Given that group identity and belonging to social networks are important for adolescents, the adoption of Internet-based communications might be a facilitating factor in the growth of early online gambling (Sarabia & Estévez, 2016).

Internet gaming disorder was included in the Appendix of the latest (fifth) edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013) as a disorder requiring more research. Furthermore, many studies indicate that maladaptive Internet consumption can lead to Internet-related disorders (Griffiths, Pontes, & Kuss, 2016), as well as having other negative consequences, such as high-school dropout and friendship abandonment (Carbonell et al., 2012). During adolescence and emerging adulthood, prevalence rates for

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alcohol and drug addictions are typically high, resulting in a number of associated problems (Richardson, Memetovic, Ratner, & Johnson, 2011; World Health Organization [WHO], 2011). For instance, the effects of substance-related addictions can sometimes initiate psychotic disorders and other mood disorders (De Rick, Vanheule, & Verhaeghe, 2009). In this regard, the WHO has emphasized that the earlier the onset age of substance use, the worse the consequences are for long-term health (WHO, 2014).

One of the determining factors for risky behavior in adolescence is family environment (Mihajlov & Vejmelka, 2017). In the case of behavioral addictions, one study found that young people with problematic Internet use had greater disapproval of their families, and perceived their parents as less supportive and warm when compared with young people with no problematic Internet use (Li, Li, & Newman, 2013). Furthermore, some studies have suggested an association between emotional dependency and both problematic Internet and mobile phone use (Estévez, Urbiola, Iruarrizaga, Onaindia, & Jauregui, 2017).

These findings resemble those found in the substance-related addiction literature (Griffiths, 2005). Furthermore, factors associated with attachment have been reported as mediators for drug consumption in adolescents (Becoña, Fernández del Río, Calafat, & Fernández-Hermida, 2014). A number of studies have noted the existence of a relationship between drug abuse in adolescence and low parental attachment (Lee & Bell, 2003). Similarly, other studies have noted that adolescents that nurture safer parental attachments tend to develop less risky behaviors, including drug use (Martínez, Fuertes, Ramos, & Hernández, 2003). Similarly, a good parent-child relationship has also been reported to be a protective factor against drug use (Cleveland, Feinberg, & Greenberg, 2010). In general, the family is perceived as a pivotal factor in determining individuals' abilities to develop skills for coping with life's difficulties (Mikulincer & Shaver, 2007).

Minors learn, through their experiences with attachment figures, how to cope with negative emotions and angst when facing situations of distress and danger. Such learning reinforces emotion regulation (i.e., individuals' ability to modify which emotions they feel, as well as when and how such emotions are experienced and expressed) (Gross, 2002; Mikulincer, Shaver, Sapir-Lavid, & Avihou-Kanza, 2009). Mikulincer, Shaver, and Pereg (2003), drawing on studies by Ainsworth and Bell (1970) on 1-year olds' behavior in strange situations, demonstrated that emotional self-regulation derives from the availability and response of parental attachment figures. Consequently, attachment stemming from early experiences of children with their primary caregivers has been shown to have an influence on the development of (a) equal relationships with peers, (b) emotional abilities, and (c) other mental health components during adolescence (Fletcher, Nutton, & Brend, 2015).

Low levels of emotion regulation have been considered to be a factor that increases the likelihood of risk behaviors in young people and minors (Mullin & Hinshaw, 2007), such as gambling disorder, gaming disorder, and Internet-related disorders (Estévez, Herrero, Sarabia, & Jauregui, 2014), as well as substance use (Schreiber, Grant, & Odlaug, 2012). However, there are gender differences among

adolescent behaviors. For instance, male adolescents are more likely to engage in substance abuse than females (Calvete & Estévez, 2009; Janfaza & Shirazi, 2015). Epidemiological studies have indicated that males consume more illegal drugs, whereas females consume more legally prescribed ones [Spanish Observatory on Drugs and Drug Addiction (Observatorio Español sobre Drogas, 2016)], although other studies have identified a similar behavioral pattern across genders (Malbergier, Cardoso, Do Amaral, & Santos, 2012). Gambling and gaming disorders are more prevalent among males (Andreassen et al., 2016; Vacaru, Shepherd, & Sheridan, 2014), whereas problematic mobile phone use and social networking tend to be higher among females (Andreassen et al., 2016; Bányai et al., 2017).

Given previous findings in the area, the present paper focuses on emotion regulation and attachment as predictors of substance addictions (i.e., alcohol and drug abuse) compared with non-substance related addictions (i.e., gambling disorder, gaming disorder, and Internet-related disorders) in adolescents and emerging adults. It also examines the gender differences in such predictors. The first goal of this study was to analyze the relationship between emotion regulation and attachment in substance addictions and non-substance addictions. The second goal was to study the mediating role of emotion regulation in the onset of substance addictions and non-substance addictions based on the attachment. The third goal was to evaluate the gender differences in emotional regulation, attachment, and behavioral addictions.

METHODS

Participants

A sample of 472 students (aged 13–21 years) was recruited from nine high schools and vocational education centers in the Álava province (Spain) with a mean age of 15.6 years ($SD = 1.33$). The selected sample comprised 222 females (51.6%), and 208 males (48.4%). The educational stage of the participants had the following distribution: vocational training, first year (2.5%); vocational training, second year (3.1%); secondary school, 9th grade (32.1%); 10th grade (32.7%), 11th grade (7%), and 12th grade (22.6%).

Measures

Emotion regulation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004; Spanish translation by Hervás & Jódar, 2008) was used in this study. The DERS assesses the obstacles for an optimal emotion regulation and comprises 28 items using 5-point Likert scales (ranging from “almost never/0%–10% of the time” to “almost always/90%–100% of the time”). Regarding item distribution, the original authors of the scale found six latent factors, whereas in the Spanish translation only five factors were identified: (a) *lack of emotional awareness*: these items reflect the tendency to attend to and acknowledge emotions (“awareness”); (b) *non-acceptance of emotional responses*: these items reflect the tendency to have negative secondary emotional responses to one's negative emotions, or non-accepting reactions to one's distress (“non-acceptance”); (c)

lack of emotional clarity: these items reflect the extent to which individuals know (and are clear about) the emotions they are experiencing (“clarity”); (d) *difficulties engaging in goal-directed behavior*: these items reflect difficulties concentrating and accomplishing tasks when experiencing negative emotions (“goals”); and (e) *lack of emotional control*: these items reflect two factors from the original scale that were merged into a single factor. The resulting factor reflects difficulties remaining in control of one’s behavior when experiencing negative emotions, and the belief that there is little that can be done to regulate emotions effectively once an individual is upset (“control”). The reliability analyses showed a satisfactory degree of internal consistency with a Cronbach’s α of .93 for the whole scale, and coefficients ranging between 0.73 and 0.91 for each subscale. Test–retest reliability over a period of 6 months was similarly positive (Hervás & Jódar, 2008). For this study, a Cronbach’s α of .91 was found, with subscales showing coefficients ranging from 0.64 to 0.89.

Attachment. The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987; Spanish translation by Gallarín & Alonso-Arbiol, 2013) was used in this study. The IPPA comprises a three-part self-report questionnaire that assesses adolescent attachment to mother, father, and peers. Each individual’s attachment to a specific person (e.g., mother and father) is assessed via a 16-item subscale (5-point Likert scale; ranging from 1 = never to 5 = always). The aggregate attachment score for each specific person (e.g., mother and father) reflects the overall strength of the attachment. High scores indicate a quality attachment, whereas low scores indicate the opposite. Regarding its reliability and validity, Armsden and Greenberg (1987) reported a good scale reliability for each specific person and the final score evaluation. The Spanish version (Gallarín & Alonso-Arbiol, 2013) showed optimum Cronbach’s α for mother ($\alpha = .87$), father ($\alpha = .88$), and peer attachment ($\alpha = .93$). For this study, internal consistency coefficient for both mother and father attachment was 0.93 and 0.97 for the peer attachment subscale.

Substance addiction. The Multicage CAD-4 (Pedrero et al., 2007) was used in this to screen for the existence of addictive behaviors (substance and non-substance behaviors) and associated problems. The target population is women and men aged between 14 and 90 years. The scale comprises 32 dichotomous items (“yes” or “no” answers) concerning eight addictive behaviors: alcohol abuse, substance abuse, gambling disorder, eating disorders, Internet addiction, video game addiction, compulsive spending, and sex addiction. For this study, only alcohol and substance abuse were included. Each behavior is evaluated via four questions that replicate the CAGE schema (Hayfield, McLeod, & Hall, 1974) including self-perception of the problem, perception by those around, feelings of guilt, and withdrawal and impulse control symptoms. Scores are interpreted as follows: 0–1 (absence of addiction problem); 2 (at-risk of addiction); 3 (very likely to have an addiction); and 4 (diagnosed as having an addiction). Internal consistency values were satisfactory ($\alpha = 0.86$ for the overall scale, and above 0.70 for each individual subscale). Test–retest reliability after 20 days was 0.89. Criterion validity was also adequate (between 90% and 100% of already

diagnosed cases were confirmed). Construct validity was similarly good. For this study, Cronbach’s α for alcohol subscale was .61 and for substance subscale it was .67.

Problematic Internet use. The Internet-related Experience Questionnaire (Beranuy, Chamarro, Graner, & Carbonell, 2009) was used in this study. The Spanish scale comprises 10 questions regarding problem Internet use, and questions are answered using 4-point Likert scales (ranging from 1 = never to 4 = always). An adequate Cronbach’s α of .77 was found for internal consistency in the original study, and .85 for this study.

Video game addiction. The Video Game-related Experience Questionnaire (Chamarro et al., 2014) was used in this study. The Spanish scale comprises 17 items concerning preoccupation, denial, tolerance, negative effects, activity, lack of control, escape, and playing urge. Scale questions are answered using a 4-point Likert (ranging from 1 = never/almost never to 4 = almost always). The Cronbach’s α for the original study was .91 and .82 in this study.

Gambling disorder. The South Oaks Gambling Screen for Adolescents (SOGS-RA; Winters, Stinchfield, & Fulkerson 1993; Spanish translation by Secades & Villa, 1998) was used in this study. The scale comprises 12 items that describe gambling behavior over the previous 12 months. Each item has a dichotomous response (yes or no), except the first item, which has four possible responses. The scores for SOGS-RA are interpreted as follows: 0–1, no problem gambling; 2–3, at-risk gambler; 4 or more, problem gambler. Problem gambling is characterized by gambling behavior that has negative effects on everyday life events, such as studying or maintaining positive relationships with friends and family. These align with criteria in the adult SOGS gambling disorder criteria. At-risk gambling is less severe, and includes symptoms that might be indicative of developing into gambling disorder in the future. Psychometric properties were adequate with an overall Cronbach’s α of .81 in the original study and .72 for this study.

Procedure

The participants were selected from education centers using convenience sampling. First, the research team made contact with different addiction prevention professionals of the different regional councils to inform them about the study. Following this, the addiction prevention specialists made contact with the different educational centers that comprised specific ages. There were also meetings with the directors of each of the schools to set up and organize the study. The final sample comprised nine educational establishments (five public schools, three private secondary schools, and one vocational training college). The questionnaire included general information about the main goals of the study. It was also made clear that there were no right or wrong responses and to mail the research team if they wanted further information about the study.

To be eligible, participants were requested to give informed consent. For minors, parents or tutors were contacted to sign consent forms. The survey was administered in the education centers to participants in collective groups, although participants responded individually. Confidentiality, anonymity, and voluntary participation were granted for

all participants. Furthermore, details to contact the research team were provided. The participants did not receive any compensation for participating in the study. Data collection took place from June 2015 to June 2016.

Ethics

The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the University of Deusto approved the study. All participants were informed about the study and all provided informed consent. Parental consent was sought for those younger than 18 years of age.

RESULTS

Following descriptive analysis of the variables (Table 1), a correlational analysis using Pearson's r was conducted to understand the relationship between attachment, gambling disorder, problematic Internet use, video game addiction, and alcohol and drug abuse (Table 2). Results showed that the addictive behaviors (i.e., gambling disorder, problematic Internet use, video game addiction, and alcohol and drug abuse) had statistically significant positive correlations between them. Similarly, emotion regulation obtained significant negative correlation with mother attachment, father attachment, peer attachment, problematic Internet use, video game addiction, and gambling disorder. It is important to note that higher scores on the DERS meant stronger problems in emotion regulation.

Second, a blockwise regression analysis was carried out to determine the predictive role of attachment and emotion regulation in addictive behaviors (Table 3). Five models were examined with attachment and emotion regulation as predictor variables. In each model, the predictor was tested against the outcome variables: gambling disorder, problematic Internet use, video game addiction, drug abuse, and alcohol abuse. It was checked that there was no multicollinearity, since variance inflation factor (VIF) values

were between 1 and 10. Results demonstrated that emotion regulation significantly predicted all five outcome variables. Lack of emotional control predicted drug abuse, video game addiction, and gambling. Lack of emotional clarity predicted video game addiction. Difficulties in goal-directed behavior predicted alcohol abuse. Non-acceptance of emotional responses predicted problematic Internet use, and lack of emotional awareness predicted drug abuse. Attachment only predicted three outcome variables (i.e., poor peer attachment predicted gambling disorder and video game addiction, and poor mother attachment predicted problematic Internet use).

Third, Student's t -tests were used to compare the mean variance between genders (Table 4). Results demonstrated that females scored higher than males on goals, mother attachment, and peer attachment, whereas males scored significantly higher than females in awareness, video game addiction, and gambling disorder. Furthermore, effects size was estimated for those variables with statistically significant differences using Cohen's d (1992), whose coefficient indicates that effect size is small for values under 0.20, medium for values around 0.50, and large when higher than 0.80. For this study, effect sizes were small for awareness ($d = -0.27$); medium for gambling disorder ($d = 0.46$), and peer attachment ($d = -0.63$), and large for video game addiction ($d = 0.82$).

DISCUSSION

This study explored the relationship between potentially addictive behaviors (both substances and behaviors), and their relationship with emotion regulation and attachment. The results demonstrated that substance addictions (alcohol and drugs) and non-substance addictions (Internet, video games, and gambling) were all positively correlated. In this regard, many studies have previously found correlations between gambling and substance use (e.g., Kausch, 2003). Furthermore, a study carried out among a sample of minors (mean age: 12.5 years) found that a large percentage of those

Table 1. Descriptive statistics of the variables in the sample

		Minimum	Maximum	Mean	SD
Gambling	397	1	7	1.32	0.95
Video game addiction	433	17	68	23.64	7.88
Problematic Internet use	399	10	36	17.02	5.48
Substance abuse	446	0	4	0.43	0.86
Alcohol abuse	452	0	4	0.6	0.95
Difficulties in emotional regulation	336	28	120	61.05	18.23
Lack of emotional awareness	408	4	20	12.09	4.25
Non-acceptance of emotional responses	401	7	35	13.67	6.26
Lack of emotional clarity	415	4	20	9.19	3.3
Difficulties engaging in goal-directed behavior	413	4	20	9.31	3.96
Lack of emotional control	380	9	45	17.76	7.69
Attachment to peers	375	16	80	61.44	16.75
Attachment to father	356	16	80	57.55	15.43
Attachment to mother	363	20	80	59.38	15.85

Note. SD: standard deviation.

Table 2. Correlations between substance and non-substance addictions, emotional regulation, and attachment

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gambling disorder	—													
2. Alcohol abuse	0.19**	—												
3. Drug abuse	0.25**	0.51**	—											
4. Problematic Internet use	0.19**	0.28**	0.21**	—										
5. Video game addiction	0.32**	0.13*	0.14**	0.35**	—									
6. DERS_awareness	-0.05	-0.07	-0.13*	-0.07	0.06	—								
7. DERS_non-acceptance	0.13*	0.20**	0.18**	0.38**	0.19**	-0.09	—							
8. DERS_clarity	0.08	0.20**	0.15**	0.30**	0.22**	0.23	0.52**	—						
9. DERS_goals	0.01	0.26**	0.20**	0.33**	0.09	-0.25	0.65**	0.40**	—					
10. DERS_control	0.20**	0.31**	0.25**	0.43**	0.26**	-0.12*	0.79**	0.53**	0.71**	—				
11. Emotion regulation (total)	0.14*	0.27**	0.21**	0.39**	0.27**	0.17**	0.88**	0.71**	0.74**	0.90**	—			
12. Mother attachment	-0.11	-0.06	0.04	-0.23**	-0.20**	-0.31**	-0.20**	-0.21**	-0.03	-0.18**	-0.25**	—		
13. Father attachment	-0.14*	-0.08	0.01	-0.23**	-0.21**	-0.25**	-0.19**	-0.24**	-0.10	-0.17**	-0.26**	0.77**	—	
14. Peer attachment	-0.10	0.00	0.03	-0.02	-0.26**	-0.25**	-0.09	-0.13*	-0.02	-0.15**	-0.18**	0.50**	0.47**	—

Note. DERS: Difficulties in Emotion Regulation Scale. ***p* < .01. **p* < .05.

scoring higher on problem gambling were cigarette smokers and alcohol drinkers (Míguez & Becoña, 2015), a finding reported in other studies (e.g., Griffiths & Sutherland, 1998). This study complements such studies but also provides additional evidence on the relationship of substance addiction with other less-studied behaviors, such as problematic Internet use and video game addiction, which only a few studies have investigated (e.g., van Rooij et al., 2014). Existing literature suggests that individuals with substance abuse are more likely to engage in sensation-seeking activities (Quigley & Leonard, 2000), with Internet use and video gaming being two activities that might fit such a profile. It should also be noted that among adolescents, in particular, when one problem behavior increases, the likelihood of the occurrence of other problem behaviors also increases (Donovan & Jessor, 1985; Griffiths & Sutherland, 1998).

This study also demonstrated that emotion regulation was positively correlated with addictive behaviors (i.e., gambling disorder, problematic Internet use, video game addiction, alcohol abuse, and drug abuse). This supports findings from previous research that has associated emotion regulation with impulse control (Schreiber et al., 2012), addictive behaviors (Coffey & Hartman, 2008), substance use (Gardner, Dishion, & Connell, 2008), and gambling disorder (Elmas, Cesur, & Oral, 2017; Williams, Grisham, Erskine, & Cassedy, 2012). Difficulty in emotion regulation is characterized by experiencing challenges in controlling overriding impulses toward negative feelings, engaging in goal-directed behavior, and retrieving efficient emotion-regulation strategies (Berking et al., 2011; Gratz & Roemer, 2004). Some studies have shown that individuals with difficulty in emotion regulation engage in addictive behaviors to avoid or regulate negative feelings and emotions (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Ricketts & Macaskill, 2003). It also appears plausible that individuals might engage in behaviors that prolong or extend positive emotional states, if they demonstrate poor regulation over their emotions or lack alternative ways of responding (Williams & Grisham, 2012).

Regarding attachment, father and mother attachment had a negative correlation with problematic Internet use and video game addiction, whereas peer attachment correlated negatively with video game addiction. These findings align well with previous studies that have noted that attachment patterns characterized by preoccupation are associated with risk behaviors in adolescents (Kobak, Zajac, & Smith, 2009; Monacis, de Palo, Griffiths, & Sinatra, 2017), although such research has not explored the relationship in behavioral addictions. For instance, in the case of problematic Internet use, it could be argued that adolescents might use Internet more excessively due to an insufficient attachment to their parent figures. Consequently, new technologies may offer safer environments for adolescents to develop their self-esteem and identity (Herrera Harfuch, Pacheco Murguía, Palomar Lever, & Zavala Andrade, 2009). Similarly, as online video games facilitate gamers to participate using alternative virtual identities, making them feel better than who they truly are (Gainsbury, 2015), it could be the case that adolescents with problems use video games as a shelter or escape (Vollmer, Randler, Horzum, & Ayas, 2014). Consequently, non-substance-related addictions may be related to the need for relational satisfaction in adolescence.

Table 3. Blockwise regression of emotion–regulation difficulties and attachment in relation to alcohol and drug abuse, problematic Internet use, video game addiction, and gambling disorder

	<i>B</i>	β	<i>T</i>
<i>Alcohol abuse</i>			
<i>(R</i> = .23, <i>R</i> ² = .05; <i>R</i> ² adjusted = .05; <i>p</i> < .01)			
DERS_Goals	0.05	0.23	3.54*
<i>Drug abuse</i>			
<i>(R</i> = .20, <i>R</i> ² = .04; <i>R</i> ² adjusted = .03; <i>p</i> < .05)			
DERS_Control	0.02	0.15	2.28**
DERS_Awareness	−0.02	−0.13	−2.01**
<i>Problematic Internet use</i>			
<i>(R</i> = .39, <i>R</i> ² = .15; <i>R</i> ² adjusted = .14; <i>p</i> < .01)			
Mother attachment	−0.04	−0.13	−2.07**
DERS_Non-acceptance	0.30	0.34	5.31*
<i>Video game addiction</i>			
<i>(R</i> = .42, <i>R</i> ² = .18; <i>R</i> ² adjusted = .17; <i>p</i> < .01)			
Peer attachment	−0.15	−0.31	−4.94*
DERS_Clarity	0.33	0.15	2.12**
DERS_Control	0.14	0.14	1.98**
<i>Gambling disorder</i>			
<i>(R</i> = .23, <i>R</i> ² = .05; <i>R</i> ² adjusted = .04; <i>p</i> < .01)			
Peer attachment	−0.01	−0.17	−2.38**
DERS_Control	0.01	0.14	1.99**

Note. DERS: Difficulties in Emotion Regulation Scale.
p* < .01. *p* < .05.

The predictive role of emotion regulation and attachment was also explored in this study. Emotion regulation was a predictor for all addictive behaviors assessed (both substance and non-substance related). The findings also demonstrated that control was the most powerful predictor. This finding supports previous studies on adults with gambling problems for which emotion regulation, and especially control, also predicted problem gambling as well as alcohol and drug abuse (Jáuregui, Estévez, & Urbiola, 2016). Research has shown that individuals with low emotion

regulation are more likely to engage in addictive behavior, or find harder to discontinue such behavior (Sayette, 2004). Emotion regulation has also been associated with gambling as a form of escape, especially among those with long-term deficits of emotion regulation (Weatherly & Miller, 2013). A number of studies have also noted that emotional states, such as lack of enthusiasm (i.e., apathy), can be at the root of problem Internet use (Esmailinasab, AndamiKhoshk, Azarmi, & SamarRakhi, 2014). This concurs with the findings of a systematic review by Kun and Demetrovics (2010), which indicated that a lower level of emotional intelligence is associated with more intensive smoking, alcohol use, and illicit drug use. Consequently, the findings from this study align well with the existing literature on addictions, and emphasize the importance of emotion regulation in predicting substance and non-substance-related behaviors.

Poor attachment predicted gambling disorder, problematic Internet use, and video game addiction. These results are relatively novel in the context of behavioral addictions and attachment, although some preliminary studies had already pointed out such relation (e.g., Monacis et al., 2017). Furthermore, Xu et al. (2014) found in a sample of 5,122 adolescents that the quality of parent–adolescent relationship and communication was closely associated with the development of adolescent Internet addiction. In the same study, authors also found that maternal attachment factors were more significantly associated with addiction onset than paternal attachment, something also demonstrated in this study in the case of maternal attachment and problematic Internet use. If early age attachment patterns have an effect in the development of adult life relationships (Hazan & Shaver, 1987), Internet use could be used to compensate for the need to form new relationships, rewarding individuals with a sense of belonging and group identity (Estévez et al., 2009), all of which is closely related to attachment. Individuals with secure attachment are characterized by the self-acceptance of their own emotional needs (Wallin, 2015). On the contrary, individuals with non-secure

Table 4. Mean differences between gender in emotional regulation, attachment, and behavioral addictions

	Males		Females		<i>T</i> (<i>df</i>)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
1. Gambling disorder	1.54	1.21	1.11	0.52	−4.03 (232.76)*
2. Alcohol abuse	0.52	0.94	0.66	0.95	1.46 (430)
3. Drug abuse	0.41	0.84	0.41	0.85	0.11 (425)
4. Problematic Internet use	17.02	5.30	17.10	5.68	0.15 (382)
5. Video game addiction	26.82	7.96	20.74	6.75	−8.36 (394.67)*
6. Awareness	12.72	4.25	11.58	4.20	−2.67 (390)*
7. Non-acceptance	13.72	5.98	13.71	6.56	−0.02 (386)
8. Clarity	8.99	3.22	9.37	3.38	1.14 (399)
9. Goals	8.79	3.60	9.80	4.24	2.57 (395.949)
10. Control	18.09	7.73	17.46	7.89	−0.78 (364)
11. Emotion regulation (total)	61.46	17.80	60.72	18.74	−0.36 (322)
12. Mother attachment	57.04	15.14	61.29	16.19	2.53 (347)*
13. Father attachment	57.04	14.55	57.79	16.24	0.45 (343)
14. Peer attachment	56.29	17.17	66.39	14.83	5.96 (342.85)*

Note. *SD*: standard deviation.
**p* < .05.

attachments (e.g., anxious-avoidant) pay little attention to their emotional needs and do not feel they can rely on somebody else's support. This could propel them to avoid interpersonal relationships (Malik, Wells, & Wittkowski, 2015), and reinforces the assumption that behavioral addictions may be understood as a form of escape and compensation from dissatisfactory relationships (Vollmer et al., 2014). Disturbed parent-child interactions cause difficulties in affect regulation, difficulties in separation/individuation, and interpersonal difficulties. Furthermore, they are viewed as antecedent variables in the development of addiction (Markus, 2003). If an individual feels unlovable and neglected and has developed a negative self-concept because of negative relationships during childhood, the individual can try to avoid this by engaging in a potentially addictive behavior (Pace, Schimmenti, Zappulla, & Di Maggio, 2013). Within a clinical framework, it has been proposed that attachment theory (Bowlby, 1973) can help to elucidate the development of addictive behaviors, and that addictive behaviors can be viewed as attachment disorders (Schimmenti & Bifulco, 2015). Moreover, research has shown that at-risk gamblers and pathological gamblers report higher levels of fearful attachment than non-problematic gamblers (Pace et al., 2013).

Another aim of the study was to examine whether gender explained differences in attachment and the other variables under examination. Results indicated that females scored significantly higher in maternal attachment and peer attachment, whereas males scored significantly higher in relation to gambling disorder and video game addiction. Previous research has demonstrated that gender has an influence in the cognitive profiles of adolescents. For instance, female adolescents show a greater degree of preoccupation concerning how they think they are going to be evaluated and perceived by others, being especially aware of the interpersonal conflicts around them (Laursen, 1996). In addition, female adolescents show greater insecurity about their own self-efficacy in resolving conflicts (Calvete & Cardeñoso, 2005).

Many studies have noted gender differences in the prevalence of gambling disorder (e.g., Shaffer, Hall, & Bilt, 1999; Stucki & Rihs-Middel, 2007). Some explanations for this difference include men's motivation to stay in control, the ludic component of gambling, sensation seeking, and the prospect of a big money win. However, women utilize gambling as a way of coping with personal problems, such as solitude, boredom, and dysphoric emotional states (Ruiz, Buil, & Moratilla, 2016). These characteristics could help to explain greater male prevalence in gambling disorder. In regard to emotion regulation, no significant differences were found between men and women except for awareness. These results differ from previous studies showing that women rely more on social support strategies and rumination, whereas men tend toward avoidance, passivity, and suppressing emotions (Blanchard-Fields & Coats, 2008; Schmitt, 2008; Vierhaus, Lohaus, & Ball, 2007). However, further research is necessary to understand the evolution of emotion-regulation strategies throughout the period of adolescence (Zimmermann & Iwanski, 2014), particularly because adolescents typically need to face emotion-regulation difficulties without having completely developed

the emotional resources and tools to efficiently deal with them (Calvete & Estévez, 2009; Steinberg, 2005).

This study is not without its limitations. First, the cross-sectional design limits the causal implications derived from the study, as opposed to a longitudinal design, which might have offered a clearer picture of the temporal impact of each variable. Similarly, adolescence is an identity-building period in which children gain independence and autonomy from their parental figures. Hence, the familial relationships might feature extraordinary characteristics during this period of time. In addition, the sample was a non-clinical group selected from the general Spanish adolescent population, and therefore, in principle, the participants did not score higher than average in any of the studied behavioral addictions. A sample comprising clinical participants might show if the results reported here can be replicated in patients diagnosed with behavioral addiction problems. Furthermore, this study relied on self-reported measures and is therefore subjected to well-known biases (e.g., recall bias and social desirability bias). Furthermore, latent factors such as attachment are complex phenomena that are difficult to represent by standard questionnaires, and the use of complementary techniques to identify attachment constructs may help to enrich the results of future studies. It is also important to note that the use of the SOGS-RA for assessing problem gambling does not allow for contrast with studies that have utilized other diagnostic screening instruments. Furthermore, a few studies have reported some problems associated with this instrument in accurately assessing problem gambling in adolescent populations (Ladouceur et al., 2000; Langhinrichsen-Rohling, Rohling, Rohde, & Seeley, 2004).

CONCLUSIONS

Despite the aforementioned limitations, this study demonstrated that emotion-regulation difficulties predict substance and non-substance-related addictions, whereas poor attachment is a predictor of non-substance addictions in adolescents. In addition, gender differences explain variations in non-substance addictions, in addition to peer attachment and mother attachment. This study provides novel evidence for future research concerning the risk and protective factors involved in both substance and behavioral addictions.

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study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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