

## Experiential Avoidance and Technological Addictions in Adolescents

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*Background and aims:* This study focuses on the use of popular information and communication technologies (ICTs) by adolescents: the Internet, mobile phones, and video games. The relationship of ICT use and experiential avoidance (EA), a construct that has emerged as underlying and transdiagnostic to a wide variety of psychological problems, including behavioral addictions, is examined. EA refers to a self-regulatory strategy involving efforts to control or escape from negative stimuli such as thoughts, feelings, or sensations that generate strong distress. This strategy, which may be adaptive in the short term, is problematic if it becomes an inflexible pattern. Thus, the aim of this study was to explore whether EA patterns were associated with addictive or problematic use of ICT in adolescents. *Methods:* A total of 317 students of the Spanish southeast between 12 and 18 years old were recruited to complete a questionnaire that included questions about general use of each ICTs, an experiential avoidance questionnaire, a brief inventory of the Big Five personality traits, and specific questionnaires on problematic use of the Internet, mobile phones, and video games. *Results:* Correlation analysis and linear regression showed that EA largely explained results regarding the addictive use of the Internet, mobile phones, and video games, but not in the same way. As regards gender, boys showed a more problematic use of video games than girls. Concerning personality factors, conscientiousness was related to all addictive behaviors. *Discussion and conclusions:* We conclude that EA is an important construct that should be considered in future models that attempt to explain addictive behaviors.

**Keywords:** adolescents, behavioral addiction, experiential avoidance, technological addiction

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### INTRODUCTION

The popularity and permanence of information and communication technologies (ICTs) has become evident; the Internet, mobile phones, and video games have taken on an important role in the socialization process, through their influence on behaviors and attitudes (Levis, 2002). Thus, the study of these technologies has become necessary in the field of psychology.

Probably due to its recent appearance in the cultural landscape, and despite being an essential element of daily life, the use of ICT has become an object of social worry, especially regarding adolescents. This worry has evolved among adolescents because ICT is a vulnerable collective of the moment and the social environment in which they live, and also because these technologies are especially present in their lives (Castellana, Sánchez-Carbonell, Graner, & Beranuy, 2007).

During recent years, ICT properties have been widely studied including the potential for addictive behavior related to their use (Kuss & Griffiths, 2012; Roberts, Yaya, & Manolis, 2014; Saldaña, 2001; Van Rooij & Prause, 2014) and the study of risk factors for ICT abuse (Carballo, Marín-Vila, Espada, Orgilés, & Piqueras, 2015; Kuss, Griffiths, Karila, & Billieux, 2014; Lam, 2014; Roberts & Pirog, 2012; Torrente, Piqueras, Orgilés, & Espada, 2014). However, there is no consensus on the nomenclature of the phenomenon, and efforts to assign it as a diagnostic category similar to pathological gambling have been unsuccessful. As a result, the study of these issues has been investigated within the framework of behavioral addictions.

Behaviors, such as shopping, gambling, working, or having sex, are socially accepted and have the common characteristic of providing a state of immediate gratification (Marlatt & Gordon, 1985). It is understood that a behavioral addiction exists when the behavior becomes problematic (because too much time is spent on it, because more relevant activities are neglected, and because it becomes the focus of thought even when not being performed) (Alonso-Fernández, 2003; Echeburúa, 1999; Holden, 2001; Lemon, 2002). ICTs promote new patterns of behavior, which may generate certain levels of dependence and abuse, such as surfing the Internet, using mobile phones, and playing video games (Sánchez-Carbonell, Beranuy, Castellana, Chamorro, & Oberst, 2008; Sussman et al., 2014). Understanding and analyzing such behavior seems logical because it may present symptoms and consequences, at least in part, similar to those seen in individuals with substance addiction (Ruiz-Olivares, Lucena, Pino, & Herruzo, 2010).

Studies with Spanish population report prevalences ranging between 3.7% and 9.9% for problematic or excessive Internet use, between 2.8% and 26.1% for the problematic use of mobile phone (Carbonell, Fúster, Chamorro, & Oberst, 2012), and between 1.7% and 10% for the problematic use of video games (Griffiths, Kuss, & King, 2012). Internet overuse has been related to more probability of suffering from insomnia, social dysfunction, depression and

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anxiety, negative thoughts interfering in social situations, higher scores on somatic symptoms, anxiety, depression and sexual dysfunction, psychological distress, sleep disorders, relief of emotional distress, and psychological distress (Carbonell, Fúster, et al., 2012). On the other hand, problematic use of mobile phone has been associated with excessive alcohol consumption, smoking, depression, academic failure, anxiety, and insomnia (Carbonell, Fúster, et al., 2012). Regarding video games abuse, one of the most obvious consequences of this problem is the alteration of a socially adaptive lifestyle, disrupting the daily temporal organization, spending an inordinate amount of time playing, or causing severe interference with other activities, such as lower interpersonal relationships, more problems and discussions on family and marital relations, lower academic performance, or abandonment of other leisure activities (Marco & Chóliz, 2013).

Increasing evidence supporting the importance of experiential avoidance (EA) in the field of addictions has been found (Buckner, Zvolensky, Farris, & Hogan, 2014; Minami, Bloom, Reed, Hayes, & Brown, 2015; Stotts et al., 2015). EA refers to a strategy of self-regulation that involves making efforts to control or escape from negative stimuli such as thoughts, feelings, or sensations that generate strong discomfort (Hayes, 1994). This strategy, which is in the short term may be useful and adaptive when handling emotions associated with certain situations, can be harmful if it is generalized and becomes an inflexible pattern. EA implies that an individual constantly struggles with these negative events, which causes greater suffering and becomes an obstacle that prevents the pursuit of valuable and positive goals (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Luciano & Hayes, 2001). Thus, Luciano (2001) defined EA as the systematic use of avoidance, resulting in chronic, general unrest; this pattern of avoidance leads to limitations on, and the extension of suffering to, various facets of life. From this perspective, two components common in the literature on coping strategies can be identified: trying to escape from stressful experiences (avoidant coping type) and inhibiting emotional expression (suppression of emotion). In addition, another component underlying EA is the belief that control over threatening events is outside oneself (lack of control), which results in avoidance. However, EA refers to a broader construct than indicated by coping and the absence of personal control (Hayes et al., 1996). In this regard, Hayes et al. (1996) suggest that EA consists of two related parts: (a) unwillingness to stay in contact with aversive private experiences including bodily sensations, emotions, thoughts, memories, and behavioral predispositions; and (b) measures taken to modify the aversive experiences or events that cause them.

Various investigations have shown that EA is common in all types of clinical populations, because it underlies many psychological issues such as affective, eating, sexual, and posttraumatic stress disorders (e.g., Berman, Wheaton, McGrath, & Abramowitz, 2010; Hayes et al., 1996; Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004; Luciano & Hayes, 2001) and even chronic conditions such as chronic pain or congenital diseases (Costa & Pinto-Gouveia, 2011; Esteve, Ramirez-Maestre, & López-Martínez, 2012). Both

in clinical and non-clinical samples, EA explains adaptation to disease and is strongly related to anxiety and depression (Berman et al., 2010; Forsyth, Parker, & Finlay, 2003; Levitt, Brown, Orsillo, & Barlow, 2004; Marx & Sloan, 2005; Tull & Gratz, 2008).

In Pepper's review (2012) the relationship between EA and a wide range of issues can be seen, including addictive behaviors. More specifically, in the work of Kingston, Clarke, and Remington (2010), EA predicted alcohol abuse, and snuff and other drug abuse, as well as self-harm, sexual promiscuity, binge eating, excessive use of video games, and aggression. In several studies with first-year college students, EA was related to lifetime history of alcohol use and other substance use disorders (Levin et al., 2012, 2014). In addition, Wetterneck, Burgess, Short, Smith, and Cervantes (2012) demonstrated how EA is involved in compulsive behaviors, such as pornography consumption through the Internet. In their study and other subsequent research on compulsive and impulsive behavior, behavioral addictions are mentioned, indicating the mediating role of EA in these problem behaviors (Hong, You, Kim, & No, 2014; Hormes, Kearns, & Timko, 2014; Wetterneck et al., 2012). According to these findings, abuse of ICT could be part of the spectrum of behaviors that an individual performs in order to escape from aversive internal stimuli, once the establishment of an inflexible EA pattern is confirmed.

Based on cumulative evidence regarding the relationship between EA and a wide range of mental and behavioral disorders, the high frequency of use of new technologies among teenagers and the risks involved, and the scarcity of studies on these variables with samples of adolescents, the aim of this study was to explore the relationship between EA and excessive use of the Internet, mobile phones, and video games in this age group. Our hypothesis is that individuals who display higher levels of EA will show increased reliance on use of the Internet, mobile phones, and video games. If the results of this study confirm the importance of EA as a risk factor for ICT abuse in an adolescent population, this will let design interventions and prevention strategies based on this construct.

## METHODS

### *Participants*

The sample consisted of 317 students at a Secondary School in the Spanish southeast (Alicante) aged between 12 and 18 years, who in the 2013/2014 academic year were enrolled in courses ranging from the first course of Compulsory Secondary Education to the second course of High School. The gender distribution was 163 boys (51.4%) and 154 girls (48.6%), with a mean age of 14.64 years ( $SD = 1.73$ ). The most common method of accessing the Internet was through a mobile phone (78.6%). Overall, 307 (97.2%) of adolescents in this sample had a mobile phone, of which 155 (50.5%) were boys, while 262 (82.9%) used video games regularly (of which 158, 60.3% were boys). Using 1.5 standard deviations above the mean in each of the measures, 9.8% of

participants were classified as problematic Internet users, 9.1% as problematic use of mobile phone, and 10.7% as problematic use of video games). A  $\chi^2$  test to check the homogeneity of the frequency distribution indicated that there was no interdependence between sex and age ( $\chi^2 = 6.62$ ;  $p = .36$ ); nor between sex and courses ( $\chi^2 = 4.56$ ;  $p = .47$ ) and thus, the distribution was homogeneous. However, the frequency distribution was not homogeneous for the sample of adolescents with mobile phone ( $\chi^2 = 5.16$ ;  $p = .02$ ), with a slightly higher percentage of boys without mobile phone 4.9% versus a .7% of girls; and for the participants who used video games regularly ( $\chi^2 = 46.71$ ;  $p = .001$ ), with a higher percentage of boys who play regularly video games (96.9%) in contrast with girls (68%).

### Measures

**Experiential avoidance.** A Spanish adaptation of the Avoidance and Fusion Questionnaire for Youth, a self-administered 17-item questionnaire measured on a Likert scale from 1 to 5, was used to measure EA (Greco, Lambert, & Baer, 2008; Greco, Murrell, & Coyne, 2005; Spanish version by Padilla, 2013). Scores are obtained on the dimensions of psychological inflexibility and EA; the higher the score, the greater the degree of EA. This measure has recently been validated for its use with a school-based sample of Spanish adolescents (Valdivia-Salas, Martín-Albo, Zaldivar, Lombas, & Jiménez, 2016). In the present study, Cronbach's alpha for the test was .83 for total score ( $n = 317$ ). An exemplary item of this questionnaire is "I try hard to erase hurtful memories from my mind" (Intento por todos los medios borrar de mi mente los recuerdos dolorosos).

**Personality traits.** Personality traits were measured through a Spanish adaptation of the Ten-Item Personality Inventory (TIPI) (Renau, Oberst, Gosling, Rusiñol, & Chamorro, 2013; Romero, Villar, Gómez-Fraguela, & López-Romero, 2012). This tool, based on other well-established instruments measuring the Big Five personality traits, consists of 10 items, each comprising a pair of descriptors that are scored from 1 (*strongly disagree*) to 7 (*strongly agree*). Each dimension of personality (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) is represented by two items. The test has been validated for young (Renau et al., 2013) and middle-age adult population (Romero et al., 2012). Regarding its reliability, all test-retest correlations are strong (at least .60) (Renau et al., 2013). Therefore, an adaptation for its use in adolescents, currently in the process of publication, was applied (Piqueras et al., 2016). This study indicates that the psychometric properties of TIPI adaptation for adolescents are adequate. Some examples of changes in the adaptation for adolescents were the replacement of terms such as "serena" (calm) by "tranquila" (quiet), "colérica" (critical) by "que critica a los demas" (critical with others), or "polifacética" (complex) by "con intereses diversos" (with diverse interests).

**Socioeconomic status (SES).** The Family Affluence Scale (FAS; Currie, Elton, Todd, & Platt, 1997) was used to

measure socioeconomic level. The FAS assesses household purchasing power or family wealth, and consists of four questions about the availability of personal rooms, number of household cars and computers, and family vacations taken in the last 12 months. The scale allows classification into three levels (low, medium, and high) of wealth or SES. The scale was developed to reliably estimate family SES in (young) children using questions they are likely to know about. It has shown good criterion and construct validity in previous studies (Boyce, Torsheim, Currie, & Zambon, 2006).

**Addictive Internet use.** The Questionnaire of Experiences Related to the Internet (CERI; Beranuy, Chamorro, Graner, & Sánchez-Carbonell, 2009) was used to measure the misuse of this technology. The scale is self-administered and contains 10 items with Likert responses of 1–4 points. It allows the evaluation of intrapersonal and interpersonal factors and provides a total score. The scale has been recently validated with Spanish adolescents (Casas, Ruiz-Olivares, & Ortega-Ruiz, 2013). In our sample, it showed an internal consistency of .81, .73, and .65 for total, intrapersonal, and interpersonal scores, respectively ( $n = 317$ ). An exemplary item of this questionnaire is "When you are not connected to the Internet, do you feel nervous or worried?" (¿Cuándo no estás conectado a Internet, te sientes agitado o preocupado?).

**Addictive mobile phone use.** The Questionnaire of Experiences Related to Mobile Phones (CERM; Beranuy et al., 2009) was used to measure the misuse of mobile phones. The scale is self-administered and contains 10 items with Likert responses of 1–4 points. It allows the evaluation of two factors: Conflicts (conflicts related to mobile phone abuse) and Problems (problems due to communication and emotional use). An overall score can also be obtained. In our sample, the scale showed an internal consistency of .79, .69, and .66 for total, Conflicts, and Problems scores, respectively ( $n = 307$ ). An exemplary item of this questionnaire is "Do you think that life without mobile phone is boring, empty, and sad?" (¿Piensas que la vida sin el móvil es aburrida, vacía y triste?).

Both CERM and CERI have been previously used with adolescent samples showing good psychometric properties (Carbonell, Chamorro, et al., 2012; Casas et al., 2013).

**Addictive use of video games.** To measure the abuse of games on any platform, the Questionnaire of Experiences Related to Video Games (CERV; Chamorro et al., 2014) was used. This scale is self-administered, contains 17 items with Likert responses of 1–4 points, and yields a total score. According to the authors' validation (Chamorro et al., 2014), a factor analysis yields two subscales: avoidance and psychological dependence, and negative consequences. This study showed an internal consistency of .93, .86, and .88 for total, avoidance and psychological dependence, and negative consequences scores, respectively ( $n = 262$ ). An exemplary item of this questionnaire is "When you are in trouble, using video games does help you to get away from it? (¿Cuando tienes problemas, usar los videojuegos te ayuda a evadirte?).

**Procedure.** A convenience sample was chosen. Educational officials granted permission for the study to take

place. In a first preparation step, a pilot study was performed among Compulsory Secondary Education students, during which feedback from students was requested on all matters relating to the contents of the questionnaire and its completion. After this phase, adjustments were made to the questionnaire to improve comprehensibility, and then the final evaluation was conducted by tutors of the 12 classrooms (two groups or classrooms per course) that participated, which had previously been informed about the instructions for the questionnaire completion. There were not participants who refused to participate.

**Statistical analysis.** The study design was descriptive and cross-sectional. IBM SPSS Statistics 20 for Windows (IBM, 2011) was used for the following: (a) analysis of correlations with Pearson coefficients, to study the relationship between EA and CERI, CERM, and CERV scores and the measure of personality traits; and (b) hierarchical multiple linear regression analysis with block input method. In this second analysis, socio-demographic variables (sex, age, and SES) were introduced first, personality variables (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) second, and the EA variable last, to measure effects after controlling other variables (sociodemographic and personality).

Effect sizes were calculated to indicate the magnitude of the association between variables in predictive models. The index used was Cohen's *d* (1988), for which values above .80 are considered to indicate large effect sizes. For greater assurance, and prior to this analysis, a database deputation was conducted. First, there were a few participants who left some of the central variables of the study absolutely empty, so they were deleted for analysis for CERI, CERM, and CERV (3, 3, and 7 participants, respectively). Second, we found 104 missing values in 69 participants whose pattern was as follows: (a) no measure had more than three missing values (1 = 77; 2 = 9; and 3 = 3) and (b) none of the participants presented more than three missing values (1 = 53; 2 = 12; and 3 = 4). Consequently, these cases with few missing values were treated, adopting multiple imputation method based on Lorenzo-Seva and Van Ginkel (2016) proposal in order to minimize bias. Subsequently, from the initial sample of 317 three samples were created for each regression analysis (samples of 314, 304, and 255 for CERI, CERM, and CERV, respectively). These different sample sizes were based on participants who reported using the Internet (317), mobile phones (307), or video games (262), respectively, as well as on the elimination of those participants who had any measure absolutely incomplete (previously described). In addition, regression assumptions were tested.

**Ethics.** The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the Miguel Hernández University of Elche (Spain) approved the study. All parents for those younger than 18 years old and all eligible children and adolescents were informed about the study and all provided informed consent. Concerning the consent form, it explained the minimal risk and potential benefits associated with participation in this study and advised

parents and participants that they could drop out the study at any time.

## RESULTS

Table 1 shows the means, standard deviations, and correlations among EA and the other study variables. EA was significantly and positively related with all CERI (total, intrapersonal conflicts, and interpersonal conflicts), CERM (total, conflict, and communication and emotional use), and CERV (total and negative consequences) scores, and negatively with agreeableness, emotional stability, and openness to experience personality traits. There was not, however, a significant relationship with other personality traits or with the score on avoidance and psychological dependence of the CERV.

Regarding the regression analysis (see Table 2), the results showed that for addictive Internet use, demographic variables did not contribute to the differences in CERI scores. In contrast, when personality variables were added to the model, conscientiousness was statistically significant for the CERI overall and intrapersonal conflicts scores, with a small to medium effect size (CERI total:  $d = -.33$ ; intrapersonal conflicts:  $d = -.46$ ). However, the biggest change in the coefficient of determination was produced by introducing the EA variable in the model (CERI total:  $\Delta R^2 = .13$ ; intrapersonal conflicts:  $\Delta R^2 = .11$ ; interpersonal conflicts:  $\Delta R^2 = .11$ ). This variable was statistically significant in all three models and had a greater effect size than any other variable included in the study (CERI total:

Table 1. Intercorrelations, means, and standard deviations for experiential avoidance scores, personality traits, use of the Internet, and video games ( $N = 314$ )

Variables	AFQ-Y	<i>M</i>	<i>SD</i>
Experiential avoidance (AFQ-Y)	–	25.98	11.70
Extraversion	-.07	4.89	1.40
Agreeableness	-.16**	5.21	1.00
Conscientiousness	-.10	5.10	1.23
Emotional stability	-.29**	4.50	1.40
Openness to experience	-.12*	5.48	1.12
CERI total	.40**	20.07	5.75
CERI intrapersonal conflicts	.38**	9.51	3.26
CERI interpersonal conflicts	.34**	10.56	3.08
CERM total <sup>a</sup>	.41**	17.82	4.88
CERM conflicts <sup>a</sup>	.31**	7.47	2.58
CERM communication and emotional use <sup>a</sup>	.41**	10.36	2.88
CERV total <sup>b</sup>	.15*	27.79	10.17
CERV avoidance and psychological dependence <sup>b</sup>	.11	13.91	5.13
CERV negative consequences <sup>b</sup>	.18**	13.89	5.44

Note. AFQ-Y: Avoidance and Fusion Questionnaire for Youth; CERI = Questionnaire of Experiences Related to the Internet; CERM = Questionnaire of Experiences Related to Mobile Phones; CERV = Questionnaire of Experiences Related to Video Games. <sup>a</sup> $n = 304$ . <sup>b</sup> $n = 255$ .

\* $p < .05$ . \*\* $p < .01$ .

Table 2. Hierarchical regression analysis of predictors of the total score of Internet addiction (CERI total score), and intrapersonal conflicts and interpersonal conflicts factors of the CERI

Variables	CERI total score				CERI intrapersonal conflicts				CERI interpersonal conflicts			
	$\Delta R^2$	$\beta$	F/t	d	$\Delta R^2$	$\beta$	F/t	d	$\Delta R^2$	$\beta$	F/t	d
Step 1	.00		.41		.00		.33		.00		4.41	
Gender		.00	-.09			-.01	-.16			.00	.00	
Age		-.01	-.11			.05	.86			-.06	-1.11	
SES		-.02	-.32			-.02	-.35			-.01	-.23	
Step 2	.06		2.28*		.10		4.47***		.02		.92	
Gender		.02	.42			.03	.52			.01	.24	
Age		-.01	-.24			.02	.43			-.05	-.88	
SES		.00	.06			.00	.08			.00	.03	
Extraversion		-.03	-.51			.01	.14			-.06	-1.08	
Agreeableness		-.02	-.32			-.08	-1.37			.05	.79	
Conscientiousness		-.17	-2.92**	-.33		-.23	-4.08***	-.46		-.07	-1.24	
Emotional stability		-.08	-1.36			-.07	-1.22			-.08	-1.27	
Openness to experience		-.10	-1.66			-.12	-2.17			-.05	-.85	
Step 3	.13		7.89***		.11		9.35***		.11		5.11***	
Gender		-.01	-.27			-.01	-.11			-.02	-.37	
Age		.03	.61			.07	1.27			-.01	-.16	
SES		.04	.71			.04	.69			.03	.59	
Extraversion		-.02	-.30			.02	.38			-.05	-.92	
Agreeableness		.00	.01			-.06	-1.13			.07	1.15	
Conscientiousness		-.15	-2.77**	-.31		-.21	-4.00***	-.45		-.06	-.99	
Emotional stability		.02	.28			.02	.33			.01	.18	
Openness to experience		-.05	-.95			-.08	-1.53			-.01	-.18	
Experiential avoidance		.39	7.06***	.80		.36	6.59***	.74		.35	6.14***	.69
Total R <sup>2</sup>	.16				.19				.11			

Note. n = 314; SES = socioeconomic status; CERI = Questionnaire of Experiences Related to the Internet.

\*p < .05. \*\*p < .01. \*\*\*p < .001.

d = .80; intrapersonal conflict: d = .74; interpersonal conflicts: d = .69). It should be noted that conscientiousness was also statistically significant for the CERI total and intrapersonal conflicts scores, with small to medium effect sizes.

Similar results can be seen for the problematic use of mobile phones (Table 3), for which sociodemographic variables did not contribute to the explanation of CERM scores. When introducing the personality variables, once again conscientiousness was statistically significant (CERM total: d = -.36; conflicts: d = -.33; communication and emotional use: d = -.31). Furthermore, SES emerged as a significant variable for conflicts, with a small effect size (d = .24). When EA was introduced, a substantial increase occurred again in R<sup>2</sup> (CERM total:  $\Delta R^2 = .13$ ; conflicts:  $\Delta R^2 = .07$ ; communication and emotional use:  $\Delta R^2 = .14$ ), and significant results were found for EA (CERM total: d = .81; conflicts: d = .58; communication and emotional use: d = .83), conscientiousness (CERM total: d = -.34; conflicts: d = -.31; communication and emotional use: d = -.29), and SES (conflicts: d = .29).

Results for the addictive use of video games (Table 4) differed from other measures; gender was found to play

an important role. When the first block was introduced, nearly large effect sizes (CERV total: d = -.75; avoidance/psychological dependence: d = -.79 and negative consequences: d = -.65) were obtained. For the second block, these values remained medium (total CERV: d = -.60; avoidance/psychological dependence: d = -.64; negative consequences: d = -.51); extroversion (total CERV: d = -.27 and avoidance/psychological dependence: d = -.28) showed low effect sizes; and conscientiousness showed a medium effect size (total CERV: d = -.43; avoidance/psychological dependence: d = -.42; negative consequences: d = -.40). When introducing EA, the change in R<sup>2</sup> was insignificant (CERV total:  $\Delta R^2 = .02$ ; avoidance/psychological dependence:  $\Delta R^2 = .01$ ; negative consequences:  $\Delta R^2 = .03$ ), with EA only showing low effect size for avoidance/psychological dependence (d = .27) and negative consequences (d = .39).

Due to the heterogeneity of the sample, we adopted further analysis on CERV as well as separated analyses only accounted for a small part of the total variance of CERV. Thus, in order to explore gender differences more deeply, two separate regression analyses for boys

Table 3. Hierarchical regression analysis of predictors of the total score for mobile phone addiction (CERM total score), and conflicts and interpersonal conflicts factors of the CERM

Variables	CERM total score				CERM conflicts				CERM communication and emotional use			
	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>
Step 1	.01		.64		.01		1.31		.01		.68	
Gender		.05	.82			.00	.01			.08	1.39	
Age		-.01	-.10			.01	.19			-.02	-.33	
SES		.06	1.00			.11	1.96			.00	-.05	
Step 2	.07		2.87**		.06		2.90**		.05		2.16*	.25
Gender		.06	1.10			.012	.21			.10	1.67	
Age		-.04	-.65			-.02	-.29			-.05	-.84	
SES		.07	1.15			.12	2.11*	.24		.00	.06	
Extraversion		.02	.27			.03	.45			.00	.06	
Agreeableness		-.07	-1.07			-.03	-.48			-.09	-1.37	
Conscientiousness		-.18	-3.12**	-.36		-.17	-2.90**	-.33		-.16	-2.67**	-.31
Emotional stability		-.09	-1.40			-.12	-1.89			-.04	-.69	
Openness to experience		-.07	-1.26			-.07	-1.26			-.06	-1.00	
Step 3	.13		8.54***		.07		5.63***		.14		8.13***	
Gender		.03	.58			-.01	-.22			.06	1.18	
Age		.00	.02			.01	.22			-.01	-.17	
SES		.09	1.75			.14	2.55*	.29		.03	.60	
Extraversion		.03	.52			.04	.63			.02	.30	
Agreeableness		-.05	-.88			-.02	-.31			-.07	-1.20	
Conscientiousness		-.16	-3.00**	-.34		-.16	-2.75**	-.31		-.14	-2.52*	-.29
Emotional stability		.01	.23			-.04	-.69			.06	1.02	
Openness to experience		-.03	-.640			-.04	-.80			-.02	-.34	
Experiential avoidance		.39	7.08***	.81		.29	5.05***	.58		.40	7.27***	.83
Total $R^2$	.18				.12				.17			

Note. *n* = 304; SES = socioeconomic status; CERM = Questionnaire of Experiences Related to Mobile Phones.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

and girls were performed. In Table 5, we can see that for boys, when introducing personality variables, extraversion (CERV total: *d* = -.38; avoidance/psychological dependence: *d* = -.38; negative consequences: *d* = -.34) and conscientiousness (CERV total: *d* = -.57; avoidance/psychological dependence: *d* = -.53; negative consequences: *d* = -.55) were significant for all CERV scores. When EA was introduced, extraversion (total CERV: *d* = -.35; avoidance/psychological dependence: *d* = -.37) and conscientiousness (CERV total: *d* = -.55; evasion and psychological dependence: *d* = -.52; negative consequences: *d* = -.54) remained significant for the mentioned CERV scores. In addition, the EA variable was significant for CERV total (*d* = .32) and negative consequences (*d* = .42). It should be noted that a socio-demographic variable, such as SES, emerged as a significant variable for negative consequences in step, with a small effect size (*d* = .34 and .40, respectively). In contrast, for girls, only SES in the three blocks (*d* = -.52, -.47, and -.45, respectively) and EA (*d* = .41 and .40) were significant in the model for CERV total and negative consequences, respectively (Table 6).

## DISCUSSION

The aim of this study was to explore whether a pattern of EA is associated with addictive or problematic use of ICT in adolescents. Overall, the results largely confirmed expectations based on this approach. The main hypothesis was supported, but with nuances, given that EA was shown to be related to the abuse of ICTs, but not in the same manner for all of them.

The data revealed that addictive use of both the Internet and mobile phones was strongly related to EA, and mainly linked to the intra-psyche and emotional aspects of such behaviors, as reflected in the greater impact on the CERI intrapersonal conflicts and CERM communication and emotional use subscales. This is consistent with our theoretical basis; the core of EA reflects the use of emotional self-regulation strategies for internal events, including addiction (and other troublesome symptoms), merely as an instrumental function, that could all be conceptualized as avoidant responses or behaviors (Pepper, 2012). It should be noted that this is especially relevant in the case of mobile phones, given their current status

Table 4. Hierarchical regression analysis for predictors of the total score of video games addiction (CERV total score), and avoidance/psychological dependence and negative consequences factors of the CERV

Variables	CERV total score				Avoidance/psychological dependence				Negative consequences			
	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>
Step 1	.14		13.42***		.15		14.92***		.11		10.53***	
Gender		-.35	-5.97***	-.75		-.37	-6.32***	-.79		-.31	-5.17***	-.65
Age		-.12	-1.97			-.09	-1.49			-.13	-2.25	
SES		-.03	-.45			-.06	-.99			.01	.09	
Step 2	.08		8.61***		.08		9.16***		.07		6.94***	
Gender		-.28	-4.76***	-.60		-.30	-5.07***	-.64		-.25	-4.08***	-.51
Age		-.10	-1.75			-.07	-1.25			-.12	-2.06*	
SES		.01	.23			-.02	-.32			.04	.72	
Extraversion		-.13	-2.18*	-.27		-.13	-2.24*	-.28		-.12	-1.95	
Agreeableness		.00	.00			.00	-.01			.00	.01	
Conscientiousness		-.20	-3.41**	-.43		-.20	-3.34**	-.42		-.19	-3.18**	-.40
Emotional stability		.03	.49			.05	.83			.01	.14	
Openness to experience		-.13	-2.21			-.13	-2.16			-.13	-2.07	
Step 3	.02		8.72***		.01		8.76***		.03		7.47***	
Gender		-.31	-5.21***	-.65		-.32	-5.38***	-.67		-.28	-4.60***	-.58
Age		-.08	-1.42			-.06	-.98			-.10	-1.69	
SES		.03	.53			.00	-.09			.06	1.06	
Extraversion		-.13	-2.16*	-.27		-.13	-2.21*	-.28		-.11	-1.92	
Agreeableness		.01	.19			.01	.14			.01	.22	
Conscientiousness		-.19	-3.20**	-.40		-.19	-3.16**	-.40		-.18	-2.96**	-.37
Emotional stability		.06	1.04			.08	1.24			.05	.76	
Openness to experience		-.10	-1.76			-.11	-1.80			-.09	-1.57	
Experiential avoidance		.17	2.77			.13	2.13*	.27		.19	3.12**	.39
Total $R^2$	.21				.22				.19			

Note. *n* = 255; SES = socioeconomic status; CERV = Questionnaire of Experiences Related to Video Games.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

among teens as an identity object closely linked to intimate and emotional aspects of the self (Castellana et al., 2007; Chóliz, Villanueva, & Chóliz, 2009; Pedrero, Rodríguez-Monk, & Ruiz-Sanchez, 2012).

The relationship between addictive use of video games and EA was different, due to the fact that the effect sizes were small for the total sample. However, there were gender differences, according to the frequency distribution of gender (boys were much more likely to use video games regularly than girls, with a ratio of 60:40), and according to the regression analysis (boys were much more likely to abuse of this technology than girls), which is consistent with previous research. Many previous studies indicated that males play video games more frequently and show higher levels of addiction compared to female players (Hong et al., 2014). However, delving into the role of EA based on gender, EA contributed to explain only the score on the CERV total and the subscale of negative consequences for boys and girls equivalently. Nevertheless, for the use of video games, EA explain less, showing lower effect sizes than for CERI and CERM.

Not only EA, but also personality variables yielded results in the regression analysis. Conscientiousness was related to most of the addictive behaviors, which is consistent with findings from other studies (Pedrero & Rojo, 2008; Puerta-Cortés & Carbonell, 2014). Most importantly, after

considering the effects of personality and sociodemographic variables, EA accounted for considerable explained variance in all cases, especially in the Internet and mobile phone uses.

Finally, it should be noted that, although it was not an aim of this study, our data about frequency of problematic uses of the Internet, mobile phone, and video games (9.8%, 9.1%, and 10.7%, respectively), were consistent with those reported in previous studies (e.g., Carbonell, Fúster, et al., 2012; Griffiths et al., 2012).

As for the limitations of this study, the following are observed: (a) the sample size was relatively small, hinders the generalization of findings; (b) only self-report measures were used in this research, which could introduce biases such as social desirability. In this sense, future research should opt for different evaluation procedures (e.g., information from parents, and objective measures of use of new technologies); (c) some variables that can be of overriding importance in the field of addictions in general, such as assertive skills or parenting styles; and of technological addictions in particular, such as parental control, have not been included in models; and (d) in terms of the research design, limitations exist with respect to the cross-sectional nature of the study, including the inability to establish clear cause-effect relationships.

Table 5. Hierarchical regression analysis for predictors of the total score of video games addiction (CERV total score), and avoidance/psychological dependence and negative consequences factors of the CERV for males

Variables	CERV total score				Avoidance/psychological dependence				Negative consequences			
	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>
Step 1	.02		1.32		.01		.45		.04		2.87	
Age		-.11	-1.36			-.08	-.94			-.14	-1.64	
SES		.04	.52			-.03	-.41			.11	1.29	
Step 2	.14		3.91**		.14		3.55**		.12		3.97**	
Age		-.06	-.78			-.02	-.30			-.09	-1.13	
SES		.11	1.40			.03	.41			.17	2.13*	.34
Extraversion		-.19	-2.33*	-.38		-.19	-2.37*	-.38		-.17	-2.11*	-.34
Agreeableness		.05	.54			.06	.76			.03	.31	
Conscientiousness		-.28	-3.51**	-.57		-.26	-3.28**	-.53		-.27	-3.42**	-.55
Emotional stability		.05	.65			.05	.67			.05	.58	
Openness to experience		-.13	-1.66			-.15	-1.86			-.11	-1.36	
Step 3	.02		4.00***		.01		3.29**		.04		4.43***	
Age		-.05	-.64			-.02	-.21			-.08	-.96	
SES		.13	1.63			.04	.54			.19	2.45*	.40
Extraversion		-.18	-2.19*	-.35		-.19	-2.27*	-.37		-.16	-1.94	
Agreeableness		.06	.68			.07	.84			.04	.49	
Conscientiousness		-.27	-3.42**	-.55		-.26	-3.21**	-.52		-.26	-3.33**	-.54
Emotional stability		.075	.92			.07	.83			.07	.93	
Openness to experience		-.120	-1.52			-.14	-1.77			-.09	-1.18	
Experiential avoidance		.158	2.00*	.32		.09	1.17			.20	2.57*	.42
Total $R^2$	.14				.11				.15			

Note. *n* = 153; SES = socioeconomic status; CERV = Questionnaire of Experiences Related to Video Games.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

Table 6. Hierarchical Regression analysis for predictors of the total score of video games addiction (CERV total score), and avoidance/psychological dependence and negative consequences factors of the CERV for females

Variables	CERV total score				Avoidance/psychological dependence				Negative consequences			
	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>	$\Delta R^2$	$\beta$	<i>F/t</i>	<i>d</i>
Step 1	.05		2.52		.02		1.28		.08		4.11	
Age		-.09	-.90			-.10	-.98			-.07	-.72	
SES		-.19	-1.91			-.11	-1.11			-.26	-2.64*	-.52
Step 2	.03		1.20		.04		.93		.03		1.55	
Age		-.10	-1.00			-.11	-1.04			-.09	-.87	
SES		-.17	-1.66			-.09	-.89			-.24	-2.38*	-.47
Extraversion		-.05	-.49			-.08	-.75			-.02	-.16	
Agreeableness		-.07	-.63			-.09	-.77			-.05	-.43	
Conscientiousness		-.10	-.94			-.11	-1.08			-.07	-.70	
Emotional stability		.03	.24			.07	.59			-.02	-.16	
Openness to experience		-.13	-1.28			-.12	-1.09			-.14	-1.38	
Step 3	.04		1.63		.04		1.33		.04		1.92	
Age		-.06	-.56			-.06	-.62			-.04	-.44	
SES		-.16	-1.57			-.08	-.79			-.23	-2.29*	-.45
Extraversion		-.06	-.58			-.09	-.84			-.02	-.24	
Agreeableness		-.05	-.49			-.07	-.63			-.03	-.29	
Conscientiousness		-.06	-.59			-.08	-.75			-.04	-.36	
Emotional stability		.10	.85			.13	1.15			.05	.44	
Openness to experience		-.06	-.53			-.04	-.39			-.07	-.64	
Experiential avoidance		.23	2.09*	.41		.22	1.98			.22	2.04*	.40
Total $R^2$	.05				.03				.07			

Note. *n* = 102; SES = socioeconomic status; CERV = Questionnaire of Experiences Related to Video Games.

\**p* < .05.

## CONCLUSIONS

In summary, this is an exploratory study that invites further research in the proposed line of investigation. It would be interesting to develop studies with a broader sample, of longitudinal design, using other forms of measurement beyond the self-report (observational and qualitative methods), and including more variables that could account for greater explained variance, all with the goal of creating new models that account for addictive behavior related to ICTs and behavioral addictions in general. Thus, the main contribution of this study is a demonstration of EA as a critical variable underlying a multitude of issues that deserves to be explored and taken into account in any future model of addiction.

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*Authors' contribution:* CGO and JAP contributed equally in the preparation of the manuscript. CGO and JAP performed the study concept and design. CGO acquired permissions for the research and collected the data. CGO and JAP analyzed and interpreted data. JAP oversaw all aspects of the study. Both authors had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Finally, both authors read and approved the final manuscript.

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