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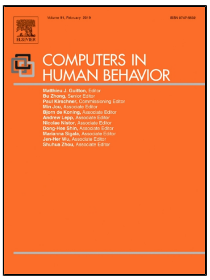

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Predictors of excessive Internet use among adolescents in Spain: The relevance of the relationship between parents and their children

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Predictors of excessive Internet use among adolescents in Spain: The relevance of the relationship between parents and their children

Abstract

Since the introduction of the concept in the late nineties, Internet addiction has been a growing phenomenon becoming a public health issue that cannot be ignored nowadays. Focusing on adolescents, previous research has analyzed the prevalence of excessive Internet use and determined several predictors such as socio-demographic characteristics, personality traits or emotions. To move on this topic, this paper draws attention to the relationship between parents and their children. Using a nationally representative sample of 37,486 students aged 14-18 years old in Spain, an under researched European country, this study finds that care received from parents [B = -0.141, SE = -0.033] and parents' knowledge about where [B = -0.065, SE = -0.032] and with whom [B = -0.232, SE = -0.032] the adolescent is while he/she goes out at night are associated with lower levels of excessive Internet use. In turn, fixing clear rules does not help reduce excessive Internet use. These results, together with the influence of other control variables, offer important insights and implications to prevent adolescents from excessive Internet use.

Keywords: Excessive Internet use, parents' rules, parents' control, affection, Spain

1. Introduction

The dissemination of information technologies is motivating a great social impact (Neverkovich et al., 2018; UNFCCC. Conference of the Parties (COP), 2015). Nowadays, Internet use is widespread due to, among others, a growth in the availability and affordability of Internet at homes (United Nations, 2011) or the increasing development and use of mobile phones and wireless devices (Kleijnen, de Ruyter, & Wetzels, 2007) that favors accessing the Internet and social networking sites anytime and anywhere (Casaló, Flavián, & Ibáñez-Sánchez, 2017). In this context, adolescents are major Internet users (Orús et al., 2016), but they are a highly vulnerable group for excessive Internet usage, which may result in Internet addiction or excessive use (Ak, Koruklu, & Yılmaz, 2013; Li, Dang, Zhang, Zhang, & Guo, 2014).

According to Young (2004), Internet addiction may be defined as compulsive behaviors related to any online activities that affect normal daily life and cause stress on social relationships, becoming a public health issue that cannot be ignored (Cash, Rae, Steel, & Winkler, 2012; Douglas et al., 2008; Malak, Khalifeh, & Shuhaiber, 2017). Although this disorder may not cause physical problems as other addictions like alcohol or drug abuse, its effects on social interactions may not be underestimated and could be similar (Douglas et al., 2008). Indeed, excessive Internet use may cause negative implications on adolescents such as social, psychological or academic difficulties (Neverkovich et al., 2018). Previous research has thus investigated the phenomenon of Internet addiction among adolescents, finding that Internet addiction among them range from 0.9% to 38% (Xu et al., 2012), although more recent studies suggest that this figure is between 5% to 10% (Atoum & Al- Hattab, 2015; Malak et al., 2017). As well, some studies have drawn attention to the determinants of Internet addiction or excessive use in order to propose prevention programs for school students, focusing especially on the socio-demographic characteristics of adolescents (Adiele & Olatokun, 2014; Ahmadi, 2014; Heo, Oh, Subramanian, Kim, & Kawachi, 2014; Tsitsika et al., 2009), personality traits (Kayiş et al., 2016; Kuss, Van Rooij, Shorter, Griffiths, & Van De Mheen, 2013), mood disorders –i.e. depression–, emotions –i.e. anxiety– (Malak et al., 2017), school climate (Li, Zhou, Li, & Zhou, 2016) or even patterns of use (Gamito et al., 2016).

However, several other aspects such as family issues or the relationship between parents and their children may be of great relevance to explain Internet addiction among adolescents (Yang, Zhu,

Chen, Song, & Wang, 2016). In this respect, Gunuc & Dogan (2013) note that spending time with their mother increases adolescents' perceived social support, which in turn is negatively related to Internet addiction. Similarly, while family functioning is negatively linked to Internet addiction (Shi, Wang, & Zou, 2017), parental conflicts are positively related to it (Yang et al., 2016; Zhou et al., 2017). According to Li et al., (2014), Internet addiction is negatively related to parents' support and positively to parents' negative control (e.g. harsh punishment, discipline, etc.). However, the influence of parental styles in adolescents' excessive Internet use remains unexplored in this emerging body of literature. Therefore, there is still a need to better understand the predictors of excessive Internet use in order to provide adolescents with guidelines of healthy Internet use.

To move on this topic, the contribution of this paper is twofold. First, not only we consider individual (sex, age, income, etc.) and family (parents' education) socio-economic characteristics that have been traditionally related to Internet addiction (Ahmadi, 2014; Heo et al., 2014; Malak et al., 2017; Tsitsika et al., 2009), but we also focus on the relationship between parents and their children. In this respect, parents use several mechanisms to monitor and regulate their children's behaviors, such as establishing rules (Parke et al., 2003; Spera, 2005), controlling their children's whereabouts and companions (Laird, Criss, Pettit, Dodge, & Bates, 2008), or the level of affect they give to their children (Spera, 2005). These aspects have been systematically found to influence children's behaviors –for example, academic success in school (Spera, 2005)–, but their association to Internet addition has not been investigated. Thus, this study may be of help to better understand the factors associated to excessive Internet use among adolescents. Second, although previous studies have analyzed Internet addiction in several European countries (Gamito et al., 2016; Hawi, Blachnio, & Przepiorka, 2015), we study these determinants of excessive Internet use in Spain, an under researched European country with higher figures of Internet Addiction than other European countries. Even though other studies have reported not significant differences between Spain and most European countries (Durkee et al., 2012), a recent study funded by the European Union with seven European countries analyzed reported that Spain has the highest prevalence of both being at risk of Internet Addiction and Internet Addiction (Tsitsika, Tzavela, & Mavromati, 2013). According to this study, the percentages of adolescent at risk for Internet Addictive Behavior are 21.3% in Spain, 11.4% in Netherlands, and 9.7% in German. Similarly, the percentages of Internet Addictive Behavior are 1.5%, 0.8%, and 0.9% for the same countries respectively. Clearly, these figures show large differences.

Using a nationally representative sample, this is among the first studies to address this cultural context. Indeed, Spain is a country with a great Internet penetration rate (greater than 80%), and 86% of Internet users are users of social networking sites (IAB Spain, 2018). In addition, adolescents in Spain are "digital natives", so they are very familiar with the use of Internet, social networking sites and mobile applications as they have grown up in a society characterized by new information technology (Chan, 2010; Orús et al., 2016). Therefore, excessive Internet use may be prevalent among adolescents in Spain, and information from this study may be of great value to plan and implement interventions against this problem (Khazaei, Khazaei, & Ghanbari-H., 2017; Malak et al., 2017).

2. Research hypotheses

As aforementioned, the present study investigates the predictors of excessive Internet use focusing on the relationship between parents and their children, as reported by students. Although we cannot measure reality, individual's perceptions may be even more relevant to determine one's behaviors (Clarkson, Hirt, Jia, & Alexander, 2010). In this way, we take into account the perceived level by students of parents' rules (both at home and away from home), parents' control (i.e. parents

knowledge about where and with whom children are when they go out at night), and care received from their parents.

Parents usually have concerns about their children's behaviors in several contexts (Kan, McHale, & Crouter, 2008), and rule setting is a mechanism used by them in order to regulate these behaviors (Parke et al., 2003). Specifically, parents' rules may be seen as a way to set limits or clarify expectations for appropriate behavior (Madsen, 2008). However, establishing excessive rules may be a counter-productive measure. Previous studies suggest that when individuals have to comply with others' expectations –for example, with parents' rules–, this may be negatively related to the desired behavior (Belanche, Casaló, & Flavián, 2012; Elliott & Ainsworth, 2012). This is explained by the fact that when rules are established, a person may reduce his or her freedom perception to act with volition and, as a result, he or she may experience reactance in order to obtain the lost freedom again (Algesheimer, Dholakia, & Herrmann, 2005). As well, the use of a high number of rules may be a sign of an authoritarian parenting style –i.e. strict parents that expect obedience (Spera, 2005)–, which is often associated with adolescent problem behaviors (Steinberg, 2001), like Internet addiction. Taking all these into account, we propose in our first hypotheses that:

H1a: Parents' rules at home are positively associated to excessive Internet use.

H1b: Parents' rules away from home are positively associated to excessive Internet use.

In addition to rules, parents' knowledge of their children's whereabouts and companions is another way to monitor them (Laird et al., 2008). In this respect, previous literature has consistently suggested that adolescents are less involved in problem behaviors when their parents know more about their whereabouts, companions, and activities (Kilgore, Snyder, & Lentz, 2000; Laird et al., 2008; Spera, 2005). Parents being well-informed is a sign of a good communication between parents and children, as children must avoid lying or leaving important details out of their conversations (Darling, Cumsille, Caldwell, & Dowdy, 2006). Therefore, in a more appropriate communication style, it may be possible to influence children's behavior in a positive manner (Casaló & Escario, 2016), as may be the avoidance of excessive Internet use. As a result, we propose in the following hypothesis that when parents remain informed about their children whereabouts and companions, children will be less Internet addicted.

H2: Parents' control is negatively associated to excessive Internet use.

Finally, the level of care and affection that adolescents receive from their parents, which may suppose a great support from them (Madsen, 2008), is another crucial aspect that determine their behaviors. According to Baumrind (1978) and Spera (2005), supportive and authoritative parents are warm and responsive, foster bidirectional communication, and encourage the independence of their children. These children are usually provided with a rationale for their actions and develop further interpersonal skills, which have been traditionally associated with positive outcomes and adolescent behaviors like social and academic success in school (Spera, 2005). Therefore, we expect that children receiving care from their parents will more likely avoid problem behaviors such as excessive Internet use. Similarly, due to data availability, we also include care received from friends and consider that it has a similar influence on adolescents, helping avoid problem behaviors. As a result, adapting this reasoning to our research context, we propose our last hypotheses:

H3a: Care received from parents is negatively associated to excessive Internet use.

H3b: Care received from friends is negatively associated to excessive Internet use.

For the shake of completeness, this study also includes sociodemographic characteristics as control variables. Specifically, sex, age, income (his/her weekly disposable income in euros), being immigrant or not, parents' education (whether their mother and father have university degree or not), the academic performance (i.e. school marks), the frequency of practicing sport, and whether the child is working or not. Indeed, previous studies (Ahmadi, 2014; Heo et al., 2014; Malak et al., 2017; Tsitsika et al., 2009) have found that these variables are relevant predictors of Internet addiction or excessive use. In sum, our research model can be seen in Figure 1.

FIGURE 1 ABOUT HERE

3. Methods

3.1 Participants.

The data used in this study come from the 2014 Spanish Survey on Drug Use in the School Population ["Encuesta Estatal Sobre Uso de Drogas en Estudiantes de Enseñazas Secundarias 2014, (ESTUDES 2014)]. This survey, which constitutes a nationally representative of Spanish students aged 14-18 years old, was carried out by the Spanish Focal Point, the Government Delegation of National Plan on Drugs (DGPNSD), in accordance with the established guidelines by the European Monitoring Centre on Drugs and Drug Addiction (EMCDDA). This common methodology guarantees the use of well-established and validated measures (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2016; Hibell et al., 2009). It follows a two-stage sample design, in which the final units (classes) are randomly selected between bigger units (schools) that have been previously and randomly selected among all schools (public and private) in Spain, considering a minimum number of schools per region. 87% of selected schools participated in the survey, the rest of schools that refused to participate were substituted by a new random sample. All attendant students in the classes selected participated in the survey; this implies an overall response rate of 85%. The questionnaire covers both individual and family socioeconomic characteristics, as well as a module about Internet use. A total of 37,486 adolescents in 941 schools and 1,858 classes were anonymously surveyed during a regular class between November 14 (2014) and April 8 (2015). The sampling error is 0.6% at a 95.5% confidence level.

3.2 Measures

3.2.1 Excessive Internet use.

To construct the dependent variable, an excessive Internet use (EIU) measure is first computed with fourteen items included in the survey (see Table 1). For all questions possible responses matches to a 1-5 scale. The items are very similar to those included in Young's Internet Addiction Test (IAT) (Young, 1998), which was specifically developed to measure addictive use of Internet. The responses given by the students have been codified as follows: 1 if "never"; 2 if "rarely"; 3 if "sometimes"; 4 if "often"; and 5 if "very frequently".

With the aim of validating this EIU measure, we performed an initial exploratory analysis of reliability and dimensionality (Anderson & Gerbing, 1988; Churchill, 1979). The Cronbach alpha indicator was used to assess the initial reliability of the scale, considering a minimum value of 0.7 (Cronbach, 1951). The Cronbach's alpha values for the EIU, reported in Table 2, reveal excellent values above 0.9 in all cases. We then proceeded to assess the dimensionality of EIU by carrying out a principal components analysis using SPSS 22.0 (see Appendix I) after checking that KMO (0.943) and Bartlett's test of sphericity ($p < 0.0001$) provided acceptable values. In addition, correlations among items are all significant and above a minimum of 0.406. Factor extraction was based on the existence of eigenvalues higher than 1; only one factor was extracted. In addition,

factor loadings were higher than 0.5 points (minimum factor loading of 0.684) and the factor extracted explained a significant percentage of total variance, 55.57% (Hair, Anderson, Tatham, & Black, 1998). A confirmatory model development strategy was then used to confirm the one-factor dimensional structure of EIU (Steenkamp & Geyskens, 2006), employing the statistical software EQS version 6.1. Specifically, we followed the criteria proposed by Jöreskog & Sörbom (1993): (1) the weak convergence criterion, which means keeping indicators that show significant factor regression coefficients (t-student > 2.58; $p < 0.01$), and (2) the strong convergence criterion, which implies eliminating non-substantial indicators (i.e. those whose standardized coefficients are lower than 0.5). All items met the required levels (see Appendix I). We then evaluate reliability of the scale using composite reliability indicator (Jöreskog, 1971), obtaining a value of 0.936, over the benchmark of 0.65 (Bagozzi & Yi, 1988). Finally, we observe that the items that compose EIU converge on only one construct as the Average Variance Extracted (AVE) is greater than 0.5 (0.511), proving convergent validity (Fornell & Larcker, 1981).

After this process of measure validation, the EIU is the sum of the points obtained in all the responses, ranging from 14 (if he/she choose the "never" option to all questions) to 70 (if he/she always answers "very frequently"). With that index, and following Young's suggestion, we consider that having an EIU equal to or above the 80% of its maximum points out that the Internet usage is causing significant problems in his/her life. In this way, we compute a dichotomous dependent variable, *Excessive Internet use*, which takes value 1 if the EIU is higher than 55 and value 0 otherwise.

TABLE 1 ABOUT HERE

TABLE 2 ABOUT HERE

3.2.2 Parents' rules, parents' control, and care from parents and friends.

The key explanatory variables measure important aspects about the interaction with parents that are reported by students. Two variables (with five possible responses), *RulesHome* and *RulesAway*, measure how often do parents establish clear rules at home and outside, respectively (0 = hardly ever; 1 = rarely; 2 = sometimes; 3 = often; 4 = almost always). Another two variables with the same scale, *KnownWho* and *KnownWhere*, take into account the knowledge of the parents about with whom and where their children are when they go out at night. Finally, the survey also provides information about how often the student receives care or affection from his/her parents (*Careparents*) and from his/her friends (*CareFriends*), both variables have also the same scale response than *RulesHome* and *RulesAway*.

3.2.3 Socio-demographic controls

The survey contains information on both individual and family socio-economic characteristics. The list of control variables include: *SexMale* (1 = male; 0 = female); *Age14* to *Age18* which measure if the respondent is 14 years old and so on, being the reference category 14 years old; *Income* (his/her weekly disposable income in euros); *Immigrant* (1 = if he/she is an immigrant; 0 = otherwise); *UniversityMother* (1 = if his/her mother has an university degree; 0 = otherwise); *UniversityFather* (1 = if his/her father has an university degree; 0 = otherwise); *SchoolMarks* (a five-item response from 1 (=best marks) to 5 (worse marks)); *SportFrequency* (0 = never; 1 = two or three times per year; 2 = two or three times per month; 3 = at least once a week; 4 = almost every day); and finally, *Working* (1 = he/she has a remunerated job; 0 = otherwise). Table 3 shows the descriptive analysis of the independent variables.

TABLE 3 ABOUT HERE

3.3 Statistical Analyses

Logistic regressions, estimated using the iteratively reweighted least squares (IWLS) approach, were used in order to evaluate the association of the predictor variables and our dependent variable. All statistical analyses were carried out with R software (version 3.4.2).

4. Results

Table 1 reports the frequencies for the fourteen self-reported items about internet use. In all cases, the highest frequency appears for the "never" option. The "rarely" and "sometimes" options are the following most reported options in this order except in two cases, items 3 and 8, where the "sometimes" option slightly surpass the "rarely" option. Clearly, the "very frequently" option appears at the bottom with frequencies below 10% except for the third item with 10.4% of adolescent reporting that parents or friends very frequently tell them that they should spend less time using Internet. The *Excessive Internet Use* variable takes value 1 (the EIU is higher than 55) for 4.39% of the students. This is to say, of the 33,211students for whom the variable can be computed, 1,457 can be considered as having excessive Internet use.

Logistic estimates for the full sample are reported in columm1 of Table 4. For parents' rules and parents' control the results are mixed. Precisely, fixing clear home rules is not associated with excessive Internet use, whereas fixing clear outside rules is positively associated with excessive Internet use. Regarding the variables that measure if parents know where and with whom are their children when they are outside, both are associated with lower prevalence of excessive Internet use.

TABLE 4 ABOUT HERE

The estimates also provide mixed results about the care role. Specifically, receiving care and affection from parents significantly reduces excessive Internet use prevalence. By contrast, there is not a significant association between receiving care or affection from friends and excessive Internet use.

The estimates of the rest of the variables can be looked up in Table 4 too. Specifically, a negative and significant association between the frequency by which adolescents practice sports and excessive Internet use is shown. In addition, regarding control variables, we observe that sex has a negative and significant coefficient for this variable, indicating that girls are more prone to excessive Internet use. However, excessive Internet use is not statistically associated with age. Finally, regarding the disposable income, the estimates show a positive and significant association with excessive Internet use.

The second and third columns of Table 4 report the estimates for girls and boys separately. In general, a consistent pattern of significance appears for both female and male students. However, fixing clear outside rules by parents appears as a significant predictor for the girls subsample but not for the boys one.

5. Discussion

The present study examines the correlates between several socioeconomic characteristics and excessive Internet use among Spanish students aged between 14 and 18 years. This survey contains fourteen items about Internet behavior which are used to compute an excessive Internet use measure similar to Young's IAT (Young, 1998). Following him, having scores equal to or above the eighty percent of its maximum is interpreted as being addicted to Internet. According to this interpretation, 4.39% of students in our sample can be considered addicted to Internet. Although it may appear,

from a statistical point of view, that 4.39% it is a small percentage, the fact is that it affects thousands of people. Given that the population in Spain in 2014 aged between 15 and 19 years old was 2,150,727, the excessive Internet use problem may affect to around 94,417 people in that range of age.

This is consistent with other studies. For example, a meta-analysis using 80 reports from 31 nations, has estimated a global prevalence of Internet addiction of 6.0% (Cheng & Li, 2014). They also estimate the prevalence for seven world regions with the highest prevalence found for the Middle East (10.9%) and the lowest prevalence found for Northern and Western Europe (2.6%). This heterogeneity could be due to different measuring methods and cultural differences across countries.

Regarding variables about parental styles, three issues should be highlighted. First, the results showed that fixing clear rules yield mixed results. Thus, while fixing clear rules at home is not a significant predictor of excessive Internet use, fixing clear outside rules increases the excessive Internet use prevalence. Therefore, we do not find support for H1a, whereas H1b is supported. The last result might appear as counterintuitive, but as we explained in the justification of the hypothesis, establishing excessive rules may result in reactance. Apart from possible teenagers' reactance and the fact that an authoritarian parenting style is usually related to adolescent problem behaviors (Steinberg, 2001), one plausible explanation is that more clear outside rules could reflect more restrictive timetables about going out at night. Consequently, worried parents could be more prone to accept more internet use in exchange for more calm that comes from knowing that children are safe in home instead of "unsafe" outside.

Second, parents' knowledge about where and with whom the adolescent is while he/she goes out at night is associated with lower levels of excessive Internet use, supporting H2. Moreover, providing a familiar environment in which adolescents feel that they can easily receive care and affection from parents is associated with lower prevalence of excessive Internet use; that is, parents' care appears as a significant protector against excessive Internet use. Overall, our results are in line with one of the most robust findings in parent-adolescent literature. Thus, it is well known that adolescents who self-report that have been raised by parents that are warm and firm (authoritative parenting style) are more psychosocially mature and competent and less prone to externalize problems (Oliva, Parra, & Arranz, 2008; Steinberg, 2001; Steinberg, Blatt-Eisengart, & Cauffman, 2006). Obviously, one possible way of externalizing problems is to seek refuge in Internet, which has the risk of originating Internet use problems. Consequently, adolescents exposed to warm parents will be more mature and competent people, and as a consequence, they will have lower risks of becoming excessive users.

Third, although the estimates show that the feeling that adolescents can get easily care and affection from parents is a protector factor against excessive Internet use, the same feeling about friends is not significantly associated with excessive Internet use. Therefore, while H3a is supported, we don't find support for H3b. Thus, although as children approach adolescence spend more and more time with friends (Deković, Wissink, & Meijer, 2004), parents appear to be more important when problems arose.

Some authors consider firmness as an important characteristic of the authoritative parenting style and highlight its key role in preventing undesirable behaviors (Claassen, 2008). Others have found that parents' efforts to control and get information about children's behavior are not successful (Kerr & Stattin, 2000) and that the authoritative parenting style is superior to the authoritarian parenting style where the parents are firm but not warm (Steinberg et al., 2006). This can be also inferred from our results. Thus, fixing clear rules appears as not significantly associated with

excessive Internet use. However, knowing about children's behavior when they are outside at night, that might reflect a warmer control, is negatively associated with excessive Internet use.

In addition, regarding the most relevant socio-demographic characteristics considered, the estimates of this paper indicated that the prevalence of excessive Internet use is negatively associated with being a male adolescent. This result is consistent with most previous research that found positive association between being female and Internet addiction (Malak et al., 2017; Rücker, Akre, Berchtold, & Suris, 2015; Tsitsika et al., 2009), although other studies found the opposite result (Wu et al., 2016;Adiele & Olatokun, 2014; Hsieh et al., 2016) . Thus, there is not general consensus about gender differences in Internet addiction (Shek & Yu, 2016). This mixed results found in the literature might be related to the different cultures analyzed or gender differences about the types of Internet interests or behaviors considered (Liang, Zhou, Yuan, Shao, & Bian, 2016).

No significant relationships were found between adolescents' age and excessive Internet use. This is not a surprising result given the disparity of estimates found in the literature. For example, Wu et al., (2016) found that the incidence of Internet addiction was higher in late adolescence than in early adolescence. In turn, Malak et al., (2017) reported that the incidence of Internet addiction increases with age from 12 to 16 years old and it drops for adolescents aged 17-18. There are also studies that found no relationship between Internet addiction and age like the present study (Lin, Lin, & Wu, 2009). Among others, the different results found in the literature can be influenced by the examination system that determines university entrance (Malak et al., 2017) and the age until the education is compulsory (Barlés, Escario, & Galbe, 2014). In this sense, those who study beyond compulsory education could be less prone to develop excessive Internet use as they are more involved with their studies. Finally, the estimates of the current study support a positive and significant association between disposable income and excessive Internet use, and a negative and significant one between the frequency with which adolescents practice sports and excessive Internet use. As could be expected, the frequency by which adolescents practice sports is one of the most important protector against excessive Internet use.

5.1 Implications

Internet Addiction and excessive use have become a public health issue in most countries that cannot be neglected as it will impose important burdens to the affected people throughout their lives. Our results can be used to infer several policy implications. First, gender and disposable income appear as important predictors of excessive Internet use in Spain. These results highlight the need of paying more attention to these groups of adolescents by their parents. Similarly, our results also underscore the key role of the parenting style in predicting excessive Internet use. Thus, as other studies suggest, both adolescent substance use and Internet addiction are associated with similar family characteristics (Yen, Yen, Chen, Chen, & Ko, 2007). As a consequence, parents should know that the best way to raise their children in order to avoid excessive Internet use, substance use and other problematic behaviors is combining communication and warmness (Steinberg et al., 2006). Moreover, encourage children to practice sports could be an effective strategy to reduce excessive Internet use.

The role of parents is also supported in other wide range of risky behaviors, suggesting that adolescents listen to parents in important topics. Thus, while only a quarter or less of adolescents reported that parents should have a say in the music they listen or the clothes they wear, the majority of adolescents reported that parents should have a say in their alcohol behavior (Jackson, 2002). Consequently, parents should talk early and often with children to set consistent norms and enforce rules in a way that are perceived as legitimate norms. This legitimacy will push to obey norms. However, too much rules and strict enforcement can yield the opposite goals and could be associated with higher Internet addiction (Wu et al., 2016).

Finally, given that policy campaigns to parents could be expensive, a simplest approach would be to implement informative campaigns at schools about the problems of excessive Internet use. These kind of informative campaigns have been proved to be protective factors in other behaviors like tobacco (Borderías, Duarte, Escario, & Molina, 2015), alcohol impaired driving (Barlés et al., 2014) and Marijuana (Duarte, Escario, & Molina, 2006). These informative campaigns can then integrate parents as targets with low costs. Moreover, successful campaigns will have direct effects cutting off the prevalence of excessive Internet use. But they will also have indirect effects in the future via peer effects (Duarte, Escario, & Molina, 2011) and intergenerational transmissions (Casaló & Escario, 2016).

5.2 Limitations and Future Research

The current study has some limitations that should be mentioned. First, some of them come from the fact of using cross-sectional data; this kind of data does not permit to stablish causal relationships. Second, the survey was developed by the DGPNSD of Spain, for which the main purpose is not identical to the research goals for this study. Therefore, the survey lacks some important information about other plausible factors of excessive Internet use, such as personality traits (Kayiş et al., 2016) or emotions (Malak et al., 2017), and the authors did not participate in the questionnaire development and could not propose more appropriate measurement scales. The psychometric characteristics of the scales used in this research should be thus analyzed in other samples (countries, age ranges, etc.). Third, this research has not differentiated among the different rule types –supervision rules, restriction rules or prescription rules– proposed in previous studies (Madsen, 2008) or among specific Internet activities (e.g. online gambling, participating in social networks, visiting sex and violence webs, etc.). Similarly, a more in-depth evaluation of the influence of parenting styles on excessive Internet use may be of help. Fourth, the survey only provides reported information from the adolescent. However, some authors conclude that adolescent responses are more objective and match better with external observers than parent responses (Gonzales, Cauce, & Mason, 1996). Finally, since we have focused on adolescents in Spain, future research could evaluate possible cultural differences across countries.

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Table 1. Excessive Internet use Items among Spanish students (Frequency and Cronbach's Alpha)

Items	Never	Rarely	Sometimes	Often	Very frequently	Cronbach's Alpha if item deleted
1) How often have you found difficult to stop using internet when you were connected?	0.288	0.273	0.238	0.121	0.080	0.933
2) How often have you stayed connected to Internet even though you wanted to stop?	0.425	0.233	0.184	0.100	0.058	0.932
3) How often your parents or your friends tell you that you should spend less time using Internet?	0.290	0.211	0.235	0.161	0.104	0.934
4) How often do you prefer using Internet instead of spending more time with others (parents, friends…)?	0.443	0.294	0.164	0.064	0.035	0.935
5) How often do you lose sleep due to being connected?	0.446	0.241	0.175	0.088	0.050	0.934
6) How often are you thinking about Internet, even though you were not connected?	0.510	0.258	0.140	0.058	0.035	0.932
7) How often are you wishing to connect to the Internet?	0.280	0.284	0.260	0.118	0.057	0.931
8) How often do you think that you should reduce your Internet use?	0.308	0.248	0.258	0.127	0.060	0.934
9) How often do you think that you stay on-line longer than you intended?	0.492	0.242	0.158	0.070	0.038	0.932
10) How often do you intend to finish your job very quickly to connect to the Internet?	0.420	0.257	0.187	0.086	0.050	0.932
11) How often do you neglect your duties (homework, family…) because you prefer connect to the Internet?	0.451	0.258	0.177	0.074	0.041	0.932
12) How often do you connect to the Internet when you are down?	0.312	0.227	0.221	0.146	0.093	0.934
13) How often do you connect to the Internet to forget your pains or negative thoughts?	0.382	0.217	0.192	0.119	0.090	0.934
14) How often do you feel yourself nervous, frustrated or irritated if you cannot use Internet?	0.514	0.239	0.137	0.065	0.046	0.932

Table 2. Descriptive analysis of the Excessive Internet Use Index

Sample	M	SD	N	Cronbach's Alpha
All	30.238	12.438	33,211	0.937
Girls[a]	31.241	12.470	16,958	0.935
Boys[a]	29.192	12.318	16,253	0.940

Note: M = Mean, SD = Standard Deviation, and N = Number of observation

[a] A two-sample t test rejects the null hypothesis of equal mean among genders (p-value<0.01)

Table 3: Descriptive analysis of the independent variables

	M	SD	N
SexMale	0.491	0.500	37,486
Age14	0.200	0.400	37,486
Age15	0.254	0.435	37,486
Age16	0.241	0.428	37,486
Age17	0.231	0.421	37,486
Age18	0.074	0.262	37,486
Income	15.331	18.116	34,274
RulesHome	3.004	1.217	36,753
RulesAway	2.392	1.337	36,684
KnowWho	3.292	1.111	36,443
KnowWhere	3.168	1.165	36,450
CareParents	3.532	0.912	36,661
CareFriends	3.397	0.979	36,616
Immigrant	0.105	0.307	37,446
UniversityMother	0.274	0.446	36,927
UniversityFather	0.244	0.429	36,514
SchoolMarks	2.807	1.068	37,022
SportFrequency	3.019	1.222	37,040
Working	0.106	0.308	37,214

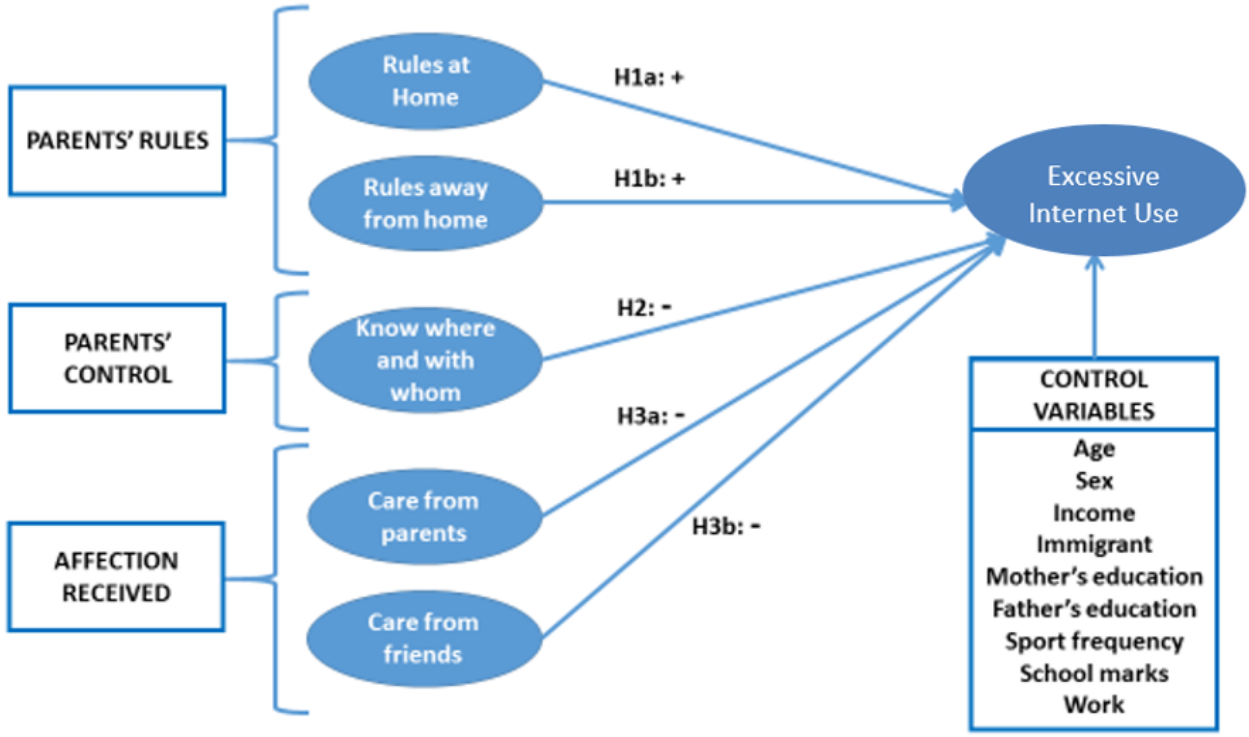
Note: M = Mean, SD = Standard Deviation, and N = Number of observation

Table 4: Logistic estimates for Excessive Internet Use

	Full sample			Girls			Boys		
Variable	B		SE B	B		SE B	B		SE B
Intercept	-2.685	***	-0.193	-2.572	***	-0.266	-3.209	***	-0.294
SexMale	-0.441	***	-0.066						
Age15	0.049		-0.091	0.139		-0.121	-0.05		-0.141
Age16	0.085		-0.092	0.193		-0.12	-0.058		-0.144
Age17	-0.127		-0.097	-0.076		-0.129	-0.169		-0.147
Age18	-0.156		-0.133	-0.109		-0.18	-0.201		-0.197
Income	0.005	***	-0.002	0.005	**	-0.002	0.004	**	-0.002
RulesHome	0.041		-0.029	0.017		-0.037	0.071		-0.047
RulesAway	0.068	**	-0.027	0.077	**	-0.034	0.058		-0.043
KnowWho	-0.232	***	-0.032	-0.291	***	-0.043	-0.16	***	-0.047
KnowWhere	-0.065	**	-0.032	-0.072	*	-0.043	-0.049		-0.047
CareParents	-0.141	***	-0.033	-0.147	***	-0.042	-0.142	***	-0.052
CareFriends	0.049		-0.034	0.036		-0.048	0.035		-0.049
Immigrant	0.141		-0.093	-0.057		-0.128	0.388	***	-0.137
UniversityMother	-0.059		-0.08	0.098		-0.105	-0.261	**	-0.125
UniversityFather	-0.018		-0.084	-0.202	*	-0.114	0.209	*	-0.124
SchoolMarks	0.327	***	-0.029	0.386	***	-0.038	0.248	***	-0.044
SportFrequency	-0.107	***	-0.024	-0.113	***	-0.029	-0.078	*	-0.043
Working	0.071		-0.095	-0.118		-0.145	0.248	*	-0.128
Deviance	9,464.2			5,317.5			4,109.4		
AIC	9,502.2			5,353.5			4,145.4		
Nº observations	28,331			14,523			13,808		

B=Estimated Coefficient; SE B= Standard error of the estimated coefficient;
* = p < 0.1; ** = p < 0.05; *** = p <0.01.

Figure 1: Research Model



Appendix I. Exploratory and confirmatory analyses of reliability and dimensionality

EIU	Exploratory Factor Analysis	Confirmatory Factor Analysis		
	Factor Loadings	Standardized Solution	t-value	ITEM R^2
Item 1	0.752	0.723*	163.360	0.523
Item 2	0.776	0.745*	162.342	0.555
Item 3	0.700	0.662*	157.293	0.438
Item 4	0.684	0.648*	118.097	0.420
Item 5	0.724	0.689*	137.546	0.475
Item 6	0.772	0.751*	137.122	0.564
Item 7	0.794	0.772*	183.842	0.595
Item 8	0.707	0.670*	142.461	0.449
Item 9	0.759	0.729*	140.069	0.532
Item 10	0.790	0.765*	165.708	0.586
Item 11	0.765	0.734*	144.421	0.538
Item 12	0.718	0.683*	163.563	0.466
Item 13	0.712	0.675*	154.607	0.455
Item 14	0.773	0.749*	142.605	0.560
	Total Variance Explained = 55.572% Eigenvalue = 7.780	AVE = 0.511 Construct Reliability = 0.936		

Note: * significant at the 0.01 level.

Highlights

- Prevalence of excessive Internet use (EIU) among adolescents in Spain is evaluated
- A nationally representative of students aged 14-18 years old in Spain is used
- Care received from parents is associated with lower levels of EIU
- Parents' knowledge about where and with whom the adolescent is also reduces EIU
- Fixing clear rules both at home and away from home does not help reduce EIU