ADICCIÓN A INTERNET Y MÓVIL: UNA REVISIÓN DE ESTUDIOS EMPÍRICOS ESPAÑOLES

Xavier Carbonell[1], Héctor Fúster[1], Ander Chamarro[2] y Ursula Oberst[1]
[1]*Universitat Ramon Llull.* [2]*Universitat Autónoma de Barcelona*

Determinar los factores que diferencian el uso de Internet y móvil saludable del patológico. Método: Se revisaron doce estudios empíricos publicados por investigadores españoles sobre adicción a Internet y teléfono móvil entre 2002 y 2011, obtenidos a partir de una búsqueda en PsycINFO y en Psicodoc. Resultados y Discusión: Se observó una relación entre el uso problemático de Internet y diversos trastornos psicológicos y entre el uso problemático y el tiempo conectado. La comunicación alterada de identidad podría explicar la diferencia entre uso seguro y problemático de Internet y móvil. La cautela de los investigadores sugiere que no se puede confirmar la existencia de un trastorno adictivo grave y persistente relacionado con el móvil e Internet en base a encuestas poblacionales.
Palabras clave: *Adicción a internet, Adicción al teléfono móvil, Uso problemático de internet, Adolescentes, Adultos jóvenes.*

Determine the factors that differentiate problematic from healthy use of Internet and mobile. Method: Twelve empirical studies about Internet addiction and mobile phone published by Spanish researchers between 2002 and 2011 were reviewed. They were obtained from a search in PsycINFO and Psicodoc. Results and Discussion: There was a relationship between problematic Internet use and psychological disorders and between problematic use and time online. Altered identity communication could explain the difference between safe and problematic Internet and mobile phone use. The researchers caution suggests that we cannot confirm the existence of a serious and persistent addictive disorder associated with the mobile and the Internet based on population surveys.
Key words: *Internet addiction, Cell phone addiction, Problematic Internet use, Teenagers, Young adults.*

S ince 1995, when Goldberg parodied the DSM based on Internet addiction and 1996, when Young gave the presentation "Internet addiction: the emergence of a new disorder" at the conference of the American Psychological Association in Toronto, the issue has been widely discussed in the media and in scientific literature (Carbonell, Guardiola, Beranuy and Belles, 2009). Interest in the possible addiction to video games, online role playing games, television and mobile phones has led to a new field of study: addiction to Information and Communication Technology (ICT) or, as in the expression coined by Griffiths (1995), "technological addictions".

During the last fifteen years, researchers have been interested in determining the distribution, frequency and causes of addiction to ICTs, especially the Internet and mobile phone (Echeburúa, Labrador & Becoña, 2009; Castellana, Sánchez-Carbonell, Graner & Beranuy, 2007; Widyanto & Griffiths, 2009) but it has not been yet resolved whether the use of ICT is capable of generating an addictive disorder of the same nature as behavioral addictions. This concern has also been echoed by Spanish researchers who, since 2002, have

published twelve empirical articles on addiction to ICT: five on Internet addiction, five on addiction to ICT and mobile phones, and two on mobile phone addiction. These studies have produced valuable insights into the problematic use of the Internet and mobile in high school and college students, offering a unique opportunity for analysis.

From our perspective, one of the unresolved issues in this field is to determine whether the addiction to ICT exists. Therefore, the main objective of this study was to determine the factors that differentiate healthy from pathological use based on the results of empirical studies carried out on Spanish students.

METHOD

Twelve empirical studies published by Spanish researchers on addiction to the Internet and mobile phone between 2002 and 2011 were reviewed, having been obtained from a search of PsycINFO and Psicodoc. A manuscript awaiting publication and a chapter of a book were added. All of them used surveys of high school and/or college students. These twelve studies evaluated addiction to/abuse of the Internet and/or mobile phone as well as personality dimensions and/or psychopathological symptoms using quantitative instruments. The data analysis was on all of

Correspondence: Xavier Carbonell. *Universitat Ramon Llull. C/ Císter 34. 08022 Barcelona. España.*
E-mail: xaviercs@blanquerna.url.edu

the correlational studies. Eleven articles were published in Spanish or international magazines and one in a chapter of a specialized book. Table 1 summarizes the basic data from these studies: (i) the authors and institution, (ii) the journal and year of publication, (iii) the type of ICT studied and (iv) the size, sex and age of the sample. The instruments used in each study are listed in Table 2 and the main results are summarized in Table 3.

RESULTS AND DISCUSSION
Instruments
A wide variety of instruments were used to measure addiction to new technologies through questionnaires focused on their use and specific scales on psychopathological symptoms (Table 2). Studies 1, 2, 5, 6, 7, 8 and 9 created their own instruments for the assessment of new technologies (studies 1, 2, 5, 6, 7, 8 and 9). In study 4, instruments for assessing addiction to

TABLE 1
BASIC DATA ON SPANISH STUDIES ON THE PROBLEMATIC USE OF
ICT AMONG ADOLESCENTS AND YOUNG STUDENTS

Study	Authors	Journal and year of publication	Type(s) of ICT studied	Sample size, gender and age
1	Viñas, Juan, Villar, Caparros, Pérez & Cornella	Clínica y Salud 2002	Internet	1,277 students from the University of Girona; 64.1% women, 35.9% men
2	Muñoz-Rivas, Navarro & Ortega	Addicciones 2003	Internet	1,301 students from the universities of San Pablo-CEU and UCM 71.3% women, 28.7% men
3	García, Terol, Nieto, Lledó, Sánchez, Martín-Aragón & Sitges	Addicciones 2008	Internet	391 students from the Miguel Hernández University (Elche) 74% women, 26% men Mean age: 19.6 years
4	Estévez, Bayón, de la Cruz & Fernández-Líria	Chapter of book: Adicción a las nuevas tecnologías [Addiction to the new technologies] 2009	Internet	699 students between 14 and 18 years of age, from three schools in the Autonomous Community of Madrid (41% private, 27% public and 31% private-public). 51% women, 49% men
5	Muñoz-Rivas, Fernández & Gámez-Guadiz	The Spanish Journal of Psychology 2010	Internet	1,301 university students; 71.3% women, 28.7 % men
6	Beranuy, Oberst, Carbonell & Chamarro	Computers in Human Behavior 2009	Internet and mobile phones	365 students from the Ramon Llull University (Barcelona); 75.1% women, 24.9% men Mean age: 21.37 años
7	Jenaro, Flores, Caballo, González & Gómez	Addiction Research and Theory 2007	Internet and mobile phones	337 students from the University of Salamanca; 72% women, 24% men
8	Beranuy, Chamarro, Graner & Carbonell	Psicothema 2009	Internet and mobile phones	322 students from the Ramon Llull University and 1,557 secondary school students from Catalonia. 45.5% men. Mean age: 15.5 years.
9	Sánchez-Martínez & Otero	Cyberpsychology and Behavior 2009	Mobile phones	1.328 secondary school students from the Community of Madrid 46.3 % men and 53.7% women between 13 and 20 years of age.
10	Labrador & Villadangos	Psicothema 2010	Internet, mobile phones, TV and video games	1,710 students from 6 schools in the Autonomous Community of Madrid 41% women, 59% men. Mean age: 14.03 años, between 12 and 17 years
11	Chóliz, Villanueva & Chóliz	RED 2009	Mobile phones	1,944 teenagers from Valencia between 12 and 18 years old, 51% women, 49% men
12	Carbonell, Chamarro, Beranuy, Griffiths, Oberst, Cladellas y Talarn	Anales de Psicología (in press)	Internet and mobile phones	322 students from the Ramon Llull University and 1,557 secondary school students from Catalonia. 45.5% men. Mean age: 15.5 years.

new technologies created by other authors (McOrman Test for Internet addiction and Young Test for Internet addiction) were adapted. Since no previous adaptation existed, the results should be interpreted with caution.

Instruments were used to measure psychological characteristics: general clinical symptomatology (the Symptoms Checklist, SCL-90-R; and Goldberg's General Health Questionnaire, GHQ-28), specific clinical symptomatology (Beck Depression Inventory, BDI; Beck Hopelessness Scale, BHS; Beck Anxiety Inventory, BAI), personality traits (Cloninger's Temperament and Character Inventory, TCI-R; and the Eysenck Personality

TABLE 2
SUMMARY OF THE INSTRUMENTS USED IN SPANISH STUDIES ON THE PROBLEMATIC USE OF ICT AMONG TEENAGERS AND YOUNG STUDENTS

Study	Instruments
Study 1 Viñas	Beck Depression Inventory (BDI) Beck Hopelessness Scale (BHS) Symptom Checklist (SCL-90-R) General data questionnaire. This was a questionnaire created by the author in which variables on the use of the Internet and the level of satisfaction in various areas of life were evaluated.
Study 2 Muñoz-Rivas, Navarro	An instrument created by the author, with 19 categorical items and 69 dichotomous items (true/false) that measured demographic variables, on the overall use of the Internet and the use of specific resources, motivations for use and interference with daily life
Study 3 García	Socio-demographic questionnaire Social expression questionnaire: Motor EMES-M and Cognitive (EMESC) Extraversion Personality Inventory (EPI) A questionnaire on use and abuse of the Internet
Study 4 Estévez	Test of addiction to the Internet by McOrman Test of addiction to the Internet by Young General Health Questionnaire by Goldberg (GHQ-28) Temperament and Character Inventory (TCI-R) A questionnaire, created by the author, that evaluates the most used Internet services as well as toxic substances or the practice of other addictive behaviors
Study 5 Muñoz-Rivas, Fernández	A questionnaire with 19 categorical items and 69 dichotomous items (true/false) of demographic variables, general and specific aspects of Internet use, reasons for Internet use, online social relationships and indicators of pathological Internet use
Study 6 Beranuy, Oberst	Questionnaire on Experiences Related to the Internet (CERI) Questionnaire on Experiences Related to the Mobile (CERM) Trait Meta-Mood Scale (TMMS-24) Symptom Checklist-90-R (SCL-90-R)
Study 7 Jenaro	Beck Depression Inventory (BDI) Beck Anxiety inventory (BAI) General Health Questionnaire by Goldberg (GHQ-28) Two instruments created by the authors with 23 items each on a 6-point Likert scale: The Scale of Internet abuse (IOS) and the Scale of Mobile Abuse (COS)
Study 8 Beranuy, Chamarro	Questionnaire on Experiences Related to the Internet (CERI) Questionnaire on Experiences Related to the Mobile (CERM)
Study 9 Sánchez-Martínez	A questionnaire, created by the authors, assessing socio-demographic variables, characteristics of mobile use, academic performance, relationships with family and friends, leisure activities, drug use and depressive symptoms.
Study 10 Labrador	A questionnaire on the detection of new addictions (DENA), an instrument created by the authors to assess demographic variables, frequency of use of ICT and the subjective perception of problems arising with the internet, mobile phone, video games and television
Study 11 Chóliz	Socio-demographic and school performance questionnaire Basic parameters of mobile phone use The image of the mobile phone Problems arising from the cost of the mobile phone
Study 12 Carbonell	A questionnaire, created by the authors, that evaluates the use of The Internet and mobile telephones. Questionnaire of Experiences Related to the Internet (CERI) Questionnaire on Experiences Related to the Mobile (CERM)

Inventory, EPI), social skills (Multidimensional Scale of Social Expression, EMES) and, finally, emotional intelligence (Trait Meta-Mood Scale, TMMS-24).

From the analysis of the instruments, we can see the diversity of the instruments used by researchers to evaluate addictive or problematic Internet and mobile use and the related characteristics and psychological disorders. This dispersion is difficult to avoid, despite the

constant recommendations on the subject (Griffiths, 1998; Widyanto and Griffiths, 2009), and due to the diversity of the instruments used, we are not able to make a recommendation regarding the most appropriate instrument for this type of study.

Psychological consequences

University students that abused the Internet were more

TABLE 3
SUMMARY OF THE MAIN FINDINGS OF SPANISH STUDIES ON THE PROBLEMATIC USE OF ICT AMONG TEENAGERS AND YOUNG STUDENTS

Study	Most relevant results from each study
Study 1	A positive correlation was observed between Internet use (mainly online chat) and various psychological indicators (depression, anxiety and sleep disturbances). 5% of students used the Internet for more than one hour a day. The use of online chat was associated with greater psychological distress, and greater dissatisfaction in family relationships and the relationship with a partner and, particularly, in the capacity or ability to maintain social relationships.
Study 2	The boys used the Internet more than the girls. Connection for over 20 hours per week was registered at 3.7%, and 17% felt that the Internet interfered in their daily life: 11% neglected their duties, 3.6% reported family problems, 2.4% reported academic and/or occupational problems and 0.2% lost friendships.
Study 3	No Internet abuse was observed. Frequent Internet users were more likely to abuse the Internet. Those who used it more had more "negative thoughts" that interfered with their social situations.
Study 4	According to McOrman's IAT, 20% were users at risk and 3.7% were problematic users. According to Young's IAT 43.3% were users at risk and 3.3% were problematic users. The men used websites more and women used email more. No differences were found in the use of online chat. A higher risk of problematic use was related to the four highest scores on the subscales of the GHQ. The problematic users had lower scores on the dimensions of self-direction and cooperation, and higher ones in novelty seeking. There was a high proportion of possible psychiatric cases in the risk group and also in the problematic use group.
Study 5	9.9% were excessive users. The overuse group were men; they spent more time online and preferred to connect at night. Abusive connection was used to deal with emotional stress; some symptoms may be interpreted as tolerance, withdrawal and loss of control, suggesting that the problems associated with excessive Internet use are similar to those of other behavioral and technological addictions.
Study 6	Psychological distress was related to maladaptive use of the Internet and the mobile phone; women scored higher than men on the mobile phone questionnaire, presenting more negative consequences of its maladaptive use. The components of Perceived Emotional Intelligence contributed to the explanation of the different indicators of psychological distress, but to a lesser degree than maladaptive use of the Internet and mobile phone.
Study 7	6.2% were pathological users of the Internet, 10.4% were pathological users of the mobile phone and 3.9% were pathological users of both. A significant association was not observed between the use of the Internet or mobile phone and abuse /dependence on drugs or pathological gambling. Excessive Internet users were more likely to experience other psychiatric disorders such as insomnia, social dysfunction, depression and anxiety.
Study 8	The mobile is less addictive than the Internet. Men displayed more addictive Internet use, while women used the mobile as a means to express and communicate emotions. It seems that the use of both technologies is more problematic in adolescence and is normalized with age, towards a more professional, less recreational use, and with fewer negative consequences.
Study 9	26.1% of women and 13% of men were dependent on the mobile phone. The intensive use of mobile phones was associated with being female, at a school located in rural areas, good family economic level, cigarette smoking, excessive alcohol consumption, depression and school failure.
Study 10	The problems of ICT: Internet (5.7% women, 4.7% men) videogames (0.3% women, 2.4% men), mobile phone (10.3% women, 6.2% men), television (10.2% for both women and men). A positive correlation was observed between age and perceived problems with the use of the Internet and mobile phone, as well as the between time spent using them and perceived problems in the use of ICT.
Study 11	The girls sent more text messages, gave more "missed calls" and generally spent more time using their mobile phones than boys. No differences were observed in the calls. The girls used the mobile phone more as a device for interpersonal communication and as a tool to deal with unpleasant emotional states. The boys used the technological functions of the phone more (eg, games, Internet downloads and connection to electronic devices).
Study 12	No differences were found between men and women as regards the Internet but there were more women in the group that had frequent problems with the mobile. It is suggested that: a) the time spent online is not in itself a good indicator of problematic use, b) a relationship emerges between problematic Internet use and psychological distress, and c) the factor that can explain this problematic use is an altered identity communication that occurs to hide true identity.

likely to have insomnia, social dysfunction, depression and anxiety (Jenaro et al., 2007), "negative thoughts" that interfere in social situations (García et al., 2008), higher scores on somatic symptoms, anxiety, sexual dysfunction and depression (Estévez et al., 2009), psychological distress (Beranuy, Oberst et al., 2009), depression, anxiety and sleep disorders (Viñas et al., 2002), alleviation of emotional distress (Muñoz-Rivas Fernández Gámez-Guadix and 2010) and psychological distress (Beranuy et al, 2009). The intensive use of mobile phones was associated with excessive consumption of alcohol, cigarette smoking, depression and academic failure (Sánchez-Martínez and Otero, 2009) and anxiety and insomnia (Jenaro et al., 2007). As the studies are correlational, it is not known whether maladaptive use leads to psychological distress and mental disorder or vice versa.

Use of Internet

The percentages reported in the prevalence of problematic Internet consumption in Spanish studies vary between 3.7% (Estévez et al., 2009), 5% (Viñas et al., 2002), 6.1% (Carbonell et al., 2012), 6.2% (Jenaro, et al., 2007) and 9.9% (Muñoz-Rivas, Fernández & Gámez-Guadix, 2010). Problematic use was higher among the youngest participants. In these studies, the most used applications were academic websites, chats (especially Messenger) and email (Carbonell et al, 2012; Estévez et al, 2009; Muñoz-Rivas, Navarro & Ortega, 2003; Viñas, et al, 2002). These results suggest that some students have problems with Internet use and that problematic use is associated with applications related to what is known as computer-mediated communication. In the case of online chat, such as Messenger, the most relevant negative consequence appears to be wasting time, while the positive aspect is maintaining social relationships with friends and acquaintances and expanding the social network.

A relationship was observed between problematic use and time online (Muñoz-Rivas, Fernández & Gámez-Guadix, 2010; Viñas et al, 2002). Despite evidence of this relationship, the duration of the connection does not have to be the cause of psychological damage (Griffiths, 2010; Widyanto & Griffiths, 2006) because there is no cause-effect relationship between time online and psychological problems, as has been observed in people who spend eight hours a day or more connected to the Internet for work or academic reasons and do not develop

a mental disorder or impairment (Muñoz-Rivas, Fernández & Gámez-Guadix, 2010, Griffiths, 2010). These results also suggest that gender is not related to problematic Internet use, although men spend more time using ICT (Estévez et al 2009; Muñoz-Rivas et al 2003; Viñas et al 2002).

Mobile phone use

In Spanish studies, the rates reported in the prevalence of problematic mobile phone consumption vary from 2.8% (Carbonell et al., 2012), 7.9% (Labrador & Villadangos (2010), 10.4% (Jenaro, et al., 2007) to 26.1% of adolescent girls and 13% of adolescent boys (Sanchez-Martinez & Otero, 2009). The results of Spanish studies suggest that women have more difficulty with mobile phone use and perceive it as more problematic than men (Carbonell et al, 2012; Beranuy, Oberst, et al, 2009; Chóliz, Villanueva & Chóliz, 2009; Jenaro, et al 2007; Villadangos & Labrador, 2010; Sánchez-Martinez & Otero, 2009).

According to Sánchez-Martinez and Otero (2009), intensive use of the mobile was associated with cigarette smoking, excessive alcohol consumption and depression. For Chóliz, Villanueva & Chóliz (2009), girls use the mobile more to deal with unpleasant mood states. One factor that emerges as an indicator of problematic use is frequent consultation of the mobile, which could indicate the importance of text messages (Labrador & Villadangos, 2010) and access to social networks.

However, there are other elements that can provide additional information on the perception of problematic mobile phone use. For example, some people may confuse dependence on a technology with addictive behavior. For this reason, some people consider themselves to be addicted to the mobile because they never leave home without it, do not switch it off at night, are always waiting for calls from family or friends, or they over-use it in their work or social life. Finally, there is also the importance of the financial costs (Griffiths, 2005). The crucial difference between some forms of gambling and pathological gambling is that the latter involves a financial cost. Major expenses may be indicative of an addiction to the mobile but teenagers' phone bills are often paid by their parents, so the financial problems may not affect the users themselves.

It is interesting how a sex addiction via the Internet is confused with an addiction to sex and yet, for example, the object of addiction is never considered to be the

phone when it is used to call so-called erotic lines, with the resulting financial difficulties and family repercussions involved. It is likely that our knowledge of the landline or "fixed" telephone facilitated the distinguishing of a "phone addiction" from an "addiction to sex via the phone." Moreover, the mobile phone is undergoing a constant process of renewal and the emergence of smartphones has led to its usage being confused with that of the computer (connection to the Internet and, therefore, to social networks).

Furthermore, the importance of age should be considered in the objective of SMS (text messaging). Young people and teenagers may use text messages for a different purpose. Whilst teenagers often use SMS to express emotional states and adults use them to confirm appointments, depending on their evolutionary process young people may have a mixed-use of SMS.

Altered identity communication

It is important to distinguish between the applications used because they suggest ideas to explain problematic Internet and mobile use in Spain. In our view, applications of real-time communication where the user need not be identified (e.g., chat rooms where one's real identity is normally hidden or online role play games where avatars are used and in which identity can be concealed or altered) best explain this problematic use and confirm earlier speculations in the field (e.g., Griffiths, 1996, 1998) and the more recent empirical work (Widyanto, Griffiths & Brunsden, 2011). Thus, we can distinguish the use of online chat, such as Messenger, or participation in social networks such as Facebook, Tuenti or Twitter, or telephone conversations using other applications that include altered identity communication. In altered identity communications, the identity game can become problematic because the experience of false identity has the ability to provide greater satisfaction than the true self, enabling individuals to escape from themselves (Carbonell, Talarn, Beranuy, Oberst & Graner, 2009; Griffiths, 2000, Matute, 2003). From this perspective, the Internet has three distinct uses: information (whether related to work, education or entertainment), communication (e.g., social networks, email, etc.), and the alteration of identity (e.g., online games and some online chat). The third of these uses would be the only one that carries a risk of generating addiction.

A similar thing happens with the phone. The traditional use of mobile phones has been communication. Since calls and SMS (and now apps) are exchanged with people whose identity is known, there is no altered identity communication and, therefore, the risk of problematic or addictive consumption is, from the perspective of the authors, very low.

Does Internet or mobile addiction exist in Spain?

Spanish researchers use a wide variety of terms to refer to the problems caused by the Internet and mobile such as "*intensive cell phone use*" (Sánchez-Martínez & Otero, 2009), "*Internet over-users*" and "*heavy Internet use*" (Jenaro, Flores, Caballo, González & Gómez, 2007), "*excessive Internet use*" (Muñoz-Rivas, Fernández & Gámez-Guadix, 2010), "Internet abuse" (García et al., 2007), "abusive or pathological use" (Muñoz-Rivas, Navarro & Ortega, 2003), "excesive use" (Viñas et al., 2002), "maladaptive use of Internet" (Beranuy, Oberst et al., 2009), "addiction to the Internet and mobile abuse" (Beranuy, Chamarro et al., 2009) and "at risk users" and "problematic users" (Estévez et al., 2010). This caution on behalf of the researchers to choose the appropriate term (Estévez et al, 2009; García et al 2007; Muñoz-Rivas, Navarro & Ortega, 2003; Viñas et al, 2002) suggests that we are unable to confirm the existence of a serious and persistent addictive disorder related to the mobile and the Internet, based on population surveys in Spain. This caution is based on the following factors inter alia: a) the absence of clinical demand commensurate with the percentage of problematic users identified by these studies (although there are isolated cases in hospitals in Barcelona); b) the questionnaires may be measuring "concern" or "perception" rather than addiction; c) normalization of behavior and/or lack of concern as the number of users grows; d) social adaptation: adolescents perceive that television generates twice the number of problems as the Internet, and ten and five times (girls and boys, respectively) more problems than videogames (Labrador & Villadangos, 2010); e) distinguishing between the loss of time for longer or shorter periods and a true addiction; and f) the significant correlation between CERI and CERM scores (Beranuy, Oberst, et al, 2009) suggests a common factor of concern or of adaptation to the technology.

When college students are asked a single question about their addiction, 16.2% consider themselves addicted to the Internet and 27.7% to the mobile (unpublished results), much higher figures than those detected by validated questionnaires. These data suggest that young people are

very sensitive to social pressure and perceive themselves as excessive users of these technologies. A number of students at our university tell us that they have been "addicted to Messenger" at some period during their adolescence. According to the authors, these students are describing a period of development with strong needs for social connections rather than a true addiction. These communication needs were met using the phone (the landline, in the seventies), Messenger in the nineties and social networks, now at the beginning of this century. Understanding this communication in a development context, instead of using a pathological framework, provides a more encouraging perspective on the role of new technologies. In the words of Estévez et al. (2009), in adolescence, the need to establish new relationships and a sense of belonging and group identity are the keys to good development during this period and the Internet is a perfect facilitator. In the same way that some university students describe themselves as former Messenger addicts, the younger students have found a more useful communication tool in other applications (e.g., Facebook) and have never used Messenger.

These considerations lead us to the question: to what extent does it make sense to use the term "Internet addiction"? The fifteen years of research that have passed since 1995 made it clear that a more specific term is needed. Our view is that to use the term "Internet addiction" is to equate problems in the use of information and communication technology with addiction to any toxic substance. The Internet is a broad term that includes safe uses of technology (work, academic) with other potentially harmful ones (identity altered communications in virtual worlds such as online chat and role play games). In this sense, it seems clear that once secondary addictions are removed (or addictions that take place on the Internet, for example, using the Internet to gamble), true Internet addictions are limited, in our view, to those involving altered identity communications. The remaining uses of the Internet appear to be safe (in terms of addiction) and therefore we believe that the term "Internet addiction" should not be used in the case of Spain. In the recent history of the Internet, terms such as "computer addiction" and "compulsive programmers" have stopped being used and are considered for obsolete, and new concerns are emerging, such as addiction to social networks (Echeburúa and de Corral, 2010).

Social concern regarding addiction to the mobile seems to have declined in Spain, as the bill paid by families has decreased and, in turn, the alarm regarding addiction to social networks has increased (Echeburúa & de Corral, 2010), possibly until it is obsolete, superseded by a new technology that is more appropriate to the social context. This change could be due to the fact that social networks, which are accessed via the mobile or computer, have become the preferred means of adolescents for short distance communication, i.e., for meetings with close friends and rapid communication of emotions. This success goes hand in hand with the application "Whatsapp", which enables the sending of messages for free between phones that have Internet access.

In this sense, a new concern is beginning to appear in the media called fear of missing out (FOMO); the concern for missing that call or SMS, remaining outside the channels of information; the user knows that other users assume that he or she is connected and fears that others might be disconcerted by not receiving an answer.

Therefore, our interpretation of the results of the Spanish studies suggests that it is not appropriate to use the term "addiction to the Internet and mobile" among Spanish students, except in the cases of some MMORPG players. Likewise, the relationship between psychological distress and problematic use of technology seems to be established and it should be clarified in what sense it is produced. However, it appears that a period of adaptation to these new technologies would reduce the associated problems. Despite the limitations of this review, in our understanding, it produces three recommendations for future research. Firstly, we propose to study clinical samples of ICT addicts in treatment and use longitudinal studies to differentiate the problems of an addictive nature from transitory and less harmful symptoms. Our second proposal is to test whether the factor that differentiates pathological (addictive?) use from excessive use and working use is altered communication identity, as we have postulated in this review. A third proposal is to encourage researchers to develop confirmatory analyses based on the results of the correlational analyses of previous studies.

REFERENCES

Beranuy, M., Chamarro, A., Graner, C., & Carbonell, X. (2009).Validación de dos escalas breves para evaluar la adicción a Internet y el abuso de móvil [Validation of two brief scales for evaluating adiction to the Internet and abuse of the mobile phone]. *Psicothema, 21(3),* 480-485.

Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in Human Behaviour 25,* 1182–1187.

Carbonell, X., Chamarro, A., Beranuy, M., Griffiths, M., Oberst, U., Cladellas, R., & Talarn, A. (2012) Problematic Internet and cell phone use in Spanish teenagers and young students. *Anales de Psicologia* (accepted).

Carbonell, X., Guardiola, E., Beranuy, M., & Belles, A. (2009). A bibliometric analysis of the scientific literature on Internet, video games, and cell phone addiction. *Journal of Medical Library Association, 97(2),* 102-107.

Carbonell, X., Talarn, A., Beranuy, M., Oberst, U., & Graner, C. (2009) Cuando jugar se convierte en un problema: el juego patológico y la adicción a los juegos de rol online [When playing becomes a problem: pathological gaming and addiction to online role playing games]. *Aloma, 25,* 201-220.

Castellana, M., Sánchez-Carbonell, X., Graner, C., & Beranuy, M. (2007). El adolescente ante las tecnologías de la información y la comunicación: Internet, móvil y videojuegos [Adolescents and information and communications technologies: internet, mobile phone and videogames]. *Papeles del Psicólogo, 28(3),* 196-204.

Chóliz, M. Villanueva, V., & Chóliz, M.C. (2009). Ellos, ellas y su móvil: Uso, abuso (¿y dependencia?) del teléfono móvil en la adolescencia [Boys, girls and their mobiles: the use and abuse of (and dependence on?) mobile phones in adolescence]. *Revista Española de Drogodependencias, 34(1),* 74-88.

Echeburúa, E., Labrador, F.J., & Becoña, E. (2009). *Adicción a las nuevas tecnologías [Addiction to new technologies].* Madrid: Pirámide.

Echeburúa, E. & de Corral, P. (2010). Adicción a las nuevas tecnologías y a las redes sociales en jóvenes: un nuevo reto [Addiction to new technologies and social networks in young people: a new challenge]. *Adicciones, 22(2),* 91-96.

Estévez, L., Bayón, C., de la Cruz, J., & Fernández-Líria, A. (2009). Uso y abuso de Internet en adolescentes [The use and abuse of the Internet among adolescents]. In E. Echeburúa, F.J. Labrador & E. Becoña (eds.). *Adicción a las nuevas tecnologías [Addiction to new technologies]*(pp. 101-130). Madrid: Pirámide.

García, J.A., Terol, M.C., Nieto, M., Lledó, A., Sánchez, S., Martín-Aragón, M., & Sitges, E. (2008). Uso y abuso de Internet en jóvenes universitarios [The use and abuse of the Internet among young university students]. *Adicciones, 20(2),* 131-142.

Griffiths, M.D. (1995). Technological addictions. *Clinical Psychology Forum, 76,* 14-19.

Griffiths, M.D. (1996). Internet addiction: An issue for clinical psychology? *Clinical Psychology Forum, 97,* 32-36.

Griffiths, M.D. (1998). Internet addiction: Does it really exist? In J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, Interpersonal and Transpersonal Applications* (pp. 61-75). New York: Academic Press.

Griffiths, M.D. (2000). Internet addiction - Time to be taken seriously? *Addiction Research, 8,* 413-418.

Griffiths, M.D. (2005). A "components" model of addiction within a biopsychosocial framework. *Journal of Substance Use, 10,* 191-197.

Griffiths, M.D. (2010). The role of context in online gaming excess and addiction: Some case study evidence. *International Journal of Mental Health and Addiction, 8,* 119-125.

Jenaro, C., Flores, N., Gómez-Vela, M., González-Gil, F., & Caballo, C. (2007). Problematic Internet and cellphone use: Psychological, behavioral, and health correlates. *Addiction Research and Theory, 15(3),* 309-320.

Labrador, F.J. & Villadongos, S. (2010). Menores y nuevas tecnologías: conductas indicadoras de posible problema de adicción [Children and new technologies: behaviors indicating possible addiction problems]. *Psicothema, 22(2),* 180-188.

Matute, H. (2003). *Adaptarse a Internet [Adapting to the Internet].* Galicia: La Voz de Galicia.

Muñoz-Rivas, M. J., Navarro, M. E., & Ortega, N. (2003). Patrones de uso de Internet en población universitaria española [Patterns of Internet use in the Spanish student population]. *Adicciones, 15,* 137-144.

Muñoz-Rivas, M. J., Fernández, L., & Gámez-Guadix, M. (2010). Analysis of the indicators of pathological Internet use in Spanish university students. *The Spanish Journal of Psychology, 13(2),* 697-707.

Sánchez-Martínez, M & Otero, A. (2009). Factors associated with cell phone use in adolescents in the community of Madrid (Spain). *Cyberpsychology and*

Behavior, 12(2), 131-137.

Viñas, F., Juan, J., Villar, E., Caparros, B., Perez, I., & Cornella, M. (2002). Internet y psicopatología: las nuevas formas de comunicación y su relación con diferentes índices de psicopatología [The Internet and psychopathology: new forms of communication and their relationship with different indices of psychopathology]. *Clínica y Salud, 13,* 235-256.

Widyanto, L. & Griffiths, M.D. (2006). Internet addiction: A critical review. *International Journal of Mental Health and Addiction, 4,* 31-51.

Widyanto, L. & Griffiths, M.D. (2009). Unravelling the Web: Adolescents and Internet Addiction. In R. Zheng, J. Burrow-Sanchez & C. Drew (Eds.), *Adolescent Online Social Communication and Behavior: Relationship Formation on the Internet* (pp. 29-49). Hershey, Pennsylvania: Idea Publishing.

Widyanto, L., Griffiths, M.D., & Brunsden, V. (2011). A psychometric comparison of the Internet Addiction Test, the Internet Related Problem Scale, and Self-Diagnosis. *Cyberpsychology, Behavior, and Social Networking, 14(3),* 141-149.