Smartphone: in communication more than addiction

Smartphone: en comunicación, algo más que una adicción

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ABSTRACT
Different researches have analyzed *Smartphone* addiction (Young, 2009; Beard, 2005). However, there is still no solid theoretical basis that allows interpreting this addictive disorder from social psychology, nor a tool for a brief early diagnosis derived from this foundation (Cuesta, Cuesta & Martínez, 2019). It is essential to create tools to investigate the psychosocial mechanisms that underlie the problematic use of the *Smartphone*, and that provide knowledge that understand its psychosocial foundations and usage profiles. **Objective**: The goal has been the creation of a brief questionnaire of addiction/problematic use to the *Smartphone* and to investigate the different psychosocial profiles of use. **Method**: A meta-analysis of the literature allowed us to detect the empirically validated psychosocial factors on which there is greater consensus. Subsequently, three discussion groups and five in-depth interviews between experts and professionals were conducted. With these data, an abbreviated questionnaire was prepared and completed by a sample of university students twice (test-retest). **Results**: The questionnaire obtained adequate *Cronbach* and test-retest values in all the items. The factor analysis made it possible for us to find 4 structural factors that were called: *enveloping, socialized, virtualized* and *stressed*. These denominations, which refer to the psychosocial factors present with greater weight in each factor, seem to indicate the existence of different patterns of problematic use of the mobile which means rethinking the addiction to the *Smartphone* not as a single concept and admitting the existence of different types of addiction. In the future, the existence of factors and their link to personality patterns should be explored.

KEYWORDS: behavioral addiction; health communication; personality addiction; *Smartphone* addiction scale.

RESUMEN
Diferentes trabajos han analizado la adicción al *Smartphone* (Young, 2009; Beard, 2005). Sin embargo, todavía no existe una base teórica sólida que permita interpretar desde la psicología social este trastorno adictivo, ni una herramienta de diagnóstico precoz breve derivada de este fundamento (Cuesta, Cuesta y Martínez, 2019). Se hace indispensable la creación de herramientas que permitan estudiar los mecanismos psicosociales que subyacen al uso problemático del *Smartphone*, y que aporte conocimientos que permitan analizar sus fundamentos psicosociales y posibles perfiles de uso. Objetivo: La creación de un cuestionario breve de adicción/uso problemático al *Smartphone* que permita investigar los diferentes perfiles psicosociales de uso. Método: Un meta análisis de la bibliografía permitió detectar los factores psicosociales validados empíricamente sobre los cuales existe mayor consenso. Posteriormente se realizaron tres grupos de discusión y cinco entrevistas en profundidad entre expertos y profesionales. Con estos datos se elaboró un cuestionario abreviado que fue cumplimentado por una muestra de jóvenes universitarios en dos ocasiones (test-retest). Resultados: El cuestionario obtuvo adecuados valores de *Cronbach* y test-retest en todos los ítems. El análisis factorial realizado permitió encontrar una estructura factorial de 4 factores de uso que fueron denominados: *envolventes, socializados, virtualizados y estresados.* Estas denominaciones, que remiten a los factores psicosociales presentes con mayor peso en cada factor, parecen indicar la existencia de diferentes patrones de uso problemático del móvil lo cual supone replantearse la adicción al *Smartphone* no como un único concepto y admitir la existencia de diferentes *tipos* de adicción. En un futuro se deberá explorar la existencia de factores y su vinculación a patrones de personalidad.

PALABRAS CLAVE: adicción comportamental, comunicación salud, escala adicción *Smartphone*; patrones consumo.

CONTENTS

Translation by **Carlos Javier Rivas Quintero** (University of the Andes, Mérida, Venezuela).

1. Introduction

Smartphones have become an essential object of day to day life, thanks to its capacity to connect to The Internet in an easy and progressively cheaper way, to make photos and videos, as well as the possibility to access numerous platforms and applications either for communication, seeking or sharing information. All of this makes them tools for connectivity among subjects or for mere entertainment, essential in the lives of individuals and among young people (Herrera-Batista, 2009). According to the report of Media General Studies (EGM Acronym for Spanish *Estudios General de Medios*) at the beginning of 2019, a third (31.2%) of daily Internet consumers in Spain were teenagers or young people from 14 to 34 years old (EGM, 2019) whose main device for access was the smartphone (95.6%) using it, above all, for instant messaging (95.8%), social media (61.3%), using applications (53.4%) and keeping informed of current affairs (44.5%). As for social media usage, this age group represents 39% of the population. On average, Spanish people spend 2.27 hours a day connected with their phones, while 49% of young people from 18 to 24 spend more than 4 hours (Ditrendia, 2019). However, the recommendation for a non-harmful use is of a maximum of 2 hours per day (OECD, 2015). In addition, its use starts sooner and sooner, as shown in the survey about Equipment and Information and Communication Technologies usage at Homes, from the Statistics National Institute [INE Acronym for Spanish *Instituto Nacional de Estadística*] (2019): 66% of the population f is indispensable rom 10 to15 has a smartphone and 90% as of the age of 13.

When the use of the *Smartphone* starts to impact negatively on how daily life unfolds in social, working or family aspects, it can be defined as a "problematic use of the mobile" (Acier & Kem, 2011; Billieux, Maurage, López-Fernández, Kuss & Griffiths, 2015) whose consequences can be: time lost, alterations of behavior, circadian rhythm, lack of self-control, isolation, low performance, etc. (Park & Rang, 2014; Vilca & Vallejos, 2015). Young people keep using the *Smartphone* despite the social or interpersonal problems it causes (Odriozola, Labrador & Becoña, 2009) since its recurring and constant use can lead people not to carry out their obligations at work, school or home. In this context the role of parents, specialists and educators is taken into account for teaching and controlling the useful and non-problematic use of the mobile (Godoy, 2017).

Based on that, the study of the excessive or problematic use of the mobile and its influence on behavior generates a great interest, due to the addictive nature and implications on public health.

Different studies have analyzed the addiction without substances and the abusive use of conducts related to new technologies, like games, the Internet or videogames (Young, 20009; Beard, 2005; Fisher, 1994). These studies have focused on measuring the use, its level and intensity for different services. Very few studies have analyzed, up until now, the reasons, from the psychosocial point of view, of the excessive use of the device per se. The DSM-5 (López, Honrubia & Freixa, 2012; Cuesta, Cuesta & Martínez, 2019) classifies addiction based on variables like tolerance, abstinence, the desire or intention of avoiding that behavior, the time spent, the reduction of other activities and the inability to stop doing a harmful activity (*American Psychiatric Association*, et al, 2014), but without considering possible psychosocial causes for it.

Other studies on the use of the *smartphone* show that it generates different sensations related with independence, status, security, control and leisure on people (García-Ruiz, Ruiz & Gómez, 2018), but there are also certain negative behaviors related to the Internet and social networks that affect health and well-being of users, such as phubbing, which causes indifference to the surroundings or to people around the user, paying his/her full attention to the mobile device (Urbina, 2014) creating problems in their interpersonal and job relationships (Treviño, 2013), nomophobia or fear of not being with the phone, circadian rhythm disorders, which makes one out of four young people to check their notifications on social networks in the middle of the night (Ditrendia, 2018) or the FoMO syndrome, (fear of missing out), losing contact and missing activities organized by others (Kuss & Griffiths, 2011). In their research on problematic mobile use, with young people from 12 to 19 years old, Santana, Gómez & Feliciano (2019) proved a correlation between a greater frequent use and a greater level of FoMO, additionally to lower communication with parents.

The creation of tools that allow studying these psychosocial mechanisms that underlie the use of the *smartphone* is indispensable, especially when an excessive or abusive use is made, and that provides knowledge to understand its psychological foundations. Additionally, considering that the main objective of a tool with these characteristics consists on carrying out screenings in real milieus (schools, fundamentally), it is necessary for the questionnaire to be "very brief" in order to allow a fast, effective and simple application.

2. Objectives

This research has the following objectives: 1) to know the motivations and contexts of the use of the *smartphone* by young people, 2) to create a brief smartphone addiction questionnaire for its early diagnosis or screening, 3) to analyze its reliability and internal validity, 4) to investigate the existence of different psychosocial patterns of use. To do so we ask the following research questions:

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RQ1: What are the behavioral motivations of young people towards the use of the *smartphone* and the problems derived from it?

RQ2: Which will be the most adequate items to customize a brief questionnaire that includes psychological, social and behavioral aspects that could underlie *smartphone* addictive behavior, as well as their reliability indexes?

RQ3: Will the internal validity analysis of the questionnaire allow finding behavior patterns or clusters that reflect different styles of the use of the *smartphone*?

3. Methods

To identify the questionnaire items from a psychosocial perspective, we conducted a revision of the existing bibliographic references over the scales that are validated and that measure the use of the *smartphone* on specialized searchers like PubMed, Scopus and the repository of digital magazines of Universidad Complutense de Madrid with the inputs "*mobile phone*" *"cell-phone", "communication", "behavior", "addictive", "personality", "Smartphone", "scale" and "questionnaire*". A final sample of 27 studies was obtained and they were codified according to the addiction evaluation scale used, evaluation factors, purpose of the questionnaire, results and significance level of the scale. An analysis of the items used for these scales allowed checking the main "components" used in the academic literature to define this behavior and used more frequently in the evaluation scales.

To study the young people and their parents' psychology, and to have data available to deepen in the behavior motives, with the objective of creating a scale, three focus groups of 10 members each were carried out: FG1 with high school teenagers (14-16 years old), FG2 with young college students (18-20 years old) and FG3 with parents of teenagers who use smartphones.

With the same objective, five in-depth interviews with experts were carried out: (I1) drug addiction, social behaviors and new addictions without substances, (I2) The Internet and virtual communities, (I3) creation and dissemination of social network platforms used mainly by teenagers, (I4) young user expert on videogames and (I5) responsible of social communication.

While the focus groups and the in-depth interviews were being carried out, a member of the research group was in charge of making it possible for the necessary requirements of the speech fluidity around the established objectives of the research to be met. The sessions were recorded and written down afterwards to perform an analysis of the data to enable: 1) the extraction of literals or *verbatims* that comprised the basic units of study and 2) to know the experts' opinion regarding the potential addictiveness of smartphones, the current use situation among young people, symptomatology, etc.
Based on the bibliographic analysis and the results from the focus groups and the in-depth interviews, a 9 items in a 7-point Likert scale questionnaire was created, being 1=No (never) and 7=always.

Subsequently, the questionnaire was completed by a sample of 66 young undergraduate subjects, with the aim of evaluating its reliability and its internal validity.

The reliability was tested through Cronbach's Alpha and permitted us to calculate the reliability coefficient regarding its internal consistency. Its reliability was also tested through test-retest: the questionnaire was completed by the same subjects a week later, which allowed us to calculate the

indexes of correlation of the 9 items that comprise the scale, therefore obtaining the reliability values regarding the scale stability.

Finally, through a factor analysis test, we analyzed the construct validity named factor or structural validity. The analysis of this structural validity permitted us to analyze the different types of use of the *smartphone* when interpreting the clusters based on the questionnaire items that saturated each factor.

4. Results

RQ1: *What are the behavioral motivations of young people towards the use of the smartphone and the problems derived from it?*
To know the behavioral aspects of young people towards the use of the *smartphone*, the data obtained from teenagers, young adults, parents and specialists in the field, through the conducted focus groups and in-depth interviews, was analyzed.

The answers and comments were grouped into six big categories: reasons as to why they connect, connectivity habits, age, role of the parents, role of educators, addiction or dependence and future. These six categories were then divided into 14 subcategories (Table 1).

Table 1. *Categorization of the information for the individual and group interviews.*

CATEGORIES	SUBCATEGORIES
1. Why do you connect?	1.1 What is the "hook" of the *smartphone*? 1.2 Accessibility and availability 1.3 Advantages versus disadvantages
2. Connectivity habits	2.1 How many times a day? How much time? 2.2 Where? When? 2.3. Quantity versus quality?
3. Age	
4. Role of the parents	4.1. Parents' technological knowledge 4.2. Parental control/parents-children relationship 4.3. Technological updating of parental attitudes. 4.4. Family upbringing. 4.5. Family habits and patterns
5. Role of educators	5.1. Syllabus updating
6. Is it a good moment to talk about addiction or dependence?	6.1. Control-Maturity 6.2. Symptoms

Source: own elaboration.

Related to the reasons as to why young people connect, the subjects coincide that the hook of the *smartphone* is its utility to facilitate communication and socialization since "*you can keep in permanent contact*" (FG3), with tools like "*WhatsApp*" (FG2), and "*to be informed of what is happening in the world*" (I1). Both young people and professionals are conscious that its easy accessibility and availability facilitate its use and make the *smartphone* a tool present for most of young people, who tend to have several devices, *"I have one (computer) in my bedroom, another one in the living room, and also tablets and play (...), so we don't get bored"* (FG1) and with better and better services *"more and more we are being offered better tablets, more multipurpose phones, cheaper gadgets and all of this makes people want to have the latest mobile"* (I2). Even though its utility is recognized, the interviewees give more importance to its possible disadvantages or undesirable consequences, where the privacy sphere bursts open to public eye turning out to be

excessive, *"it is like the Truman show, everyone knows everything"* (I2) and creating a social conditioning of sharing it all, *"you just get (a photo) and you do not have the option for not accepting it"* (I1).

On connectivity habits, all the subjects stated being constantly connected, *"I use it every day, well, from Monday to Friday a little less because I study, and then I even fall asleep with the phone on my hand"* (FG1), *"I use the phone every day, mainly for WhatsApp and making phone calls"* (I4); unaware of this involving any kind of problem *"my parents tell me not to spend so much time on the phone, (...) I don't know,"* (I5). However, young people use their mobiles before, during and after doing homework, before going to bed, when they wake up, at the table, in the shower, if they go out with friends and even in class, although it is forbidden *"every day at every hour, in every class… it is just how it is"* (I5), *"in class there are some who are addicted to Instagram, they are connected all day"* (FG1). Even though young people and teenagers state the use of the mobile as a communication and socialization tool, the increase in the amount of time they spend connected is not a synonym of greater quality of that socializing process, *"you can have 700 friends on Facebook but in reality you chat with ten and the rest are blocked so you don't see their photos"* (I2), *"maybe you have people there who are not your friends"* (FG2).

All the interviewees coincide in pointing out that the age for young people to start using smartphones is every time younger, *"you start earlier, (...) before it was at 17 years old and now at 13"* (F2.FG3), *"my four-year-old son handles the iPhone incredibly well"* (F3Fg3); spurred by the parents as a way to locate their children, *"we have to leave the phone with them just in case something happens and know where they are"* (F2.FG3), *"if they have a schedule for using public transit and you notice they are late, well you pick it up and call so you feel calm"* (F4.FG3). Even if there is a minimum age requirement for you to open an account on a social network, teenagers admit lying so they get registered, *"a lot of people lie regarding age when registering on a social network just to be able to do it; skipping, for example, Tuenti above-14-years-old restriction"* (IF1).

As for the role of the parents, there is a predominant discursive position in all the groups stating that the knowledge that parents have regarding how to operate new technologies, in general, and state-of-the-art phones, in particular, is way less compared to their children's, *"parents have less technological control than children. Children are more advanced"* (I2). *"Unfortunately, I do not know how to keep track of that, because I don't know. I know how to use WhatsApp and nothing more"* (M3.FG3). Additionally, and maybe as something deriving or as consequence of it, it is also identified that the level of utility that parents get from these tools is also lower than what young people get, *"we complain, but it is what it is. There are things I can't control and he/she tells me: mom, you're behind the times"* (M1.FG3). In the case of parental control, parents take some measures to control the time spent and know the type of information their children consume, who are their virtual friends and to establish schedules, *"they have set a schedule for us, on weekdays, 15 minutes after homework"* (FG3); or checking the browsing history and visited websites, *"it is almost mandatory that, as a parent, you have to see which sites they have been to (on favorites, on which webpages)"* (I1). However, both, experts and young people, suggest as more convenient a pro-technological stand from the parents to foster trust in their children, *"sharing an e-mail account between parent and child protects them from an inappropriate use"* (I3), *"but come on, it is not a big deal for me. I have Facebook and I even added my mother and I don't care"* (FG2). The subjects gave great importance to family upbringing in young people to acquire maturity and control for a responsible use, *"(...) the importance of this group (the parents) when it comes to educating, orienting and limiting their children on smartphone use"* (I2), *"you have to teach them how to be responsible. Parents have to keep an eye on them, watching"* (FG3), *"tell them there is a limit for them to set that limit themselves, here starts your liberty and you have to know where it ends"* (FG2);

however, certain factors that can hinder this educational program were identified, like the problem of balancing work and family (*"in this country the work and family conciliation won't happen. I would like to get up at 5 or 6 am to have my afternoons free so I could spend time with my children"* (FG3)), or the "bad" influences of certain family contexts that predispose teenagers to make inappropriate use of it (*"my case is worse, my daughter is on WhatsApp all the time and on Tuenti and Instagram since she gets up, but her father does the same. He chides her, but he is even worse"* (FG3)).

Regarding the role of educators, the subjects coincide with the necessity of changing the traditional educational model including teaching and reflection about the appropriate use of mobiles among young people and setting differentiation criteria between useful and safe information and the one that is not worthy, *"there must be tutelage, supervision, probably training (...) I don't even know (...) because on cybernetic aspects there are evidently more risks than mere abuse. From that perspective I believe that a specific training is necessary"* (I3).

It is important to know how much young people control the use of their mobile and if they show sufficient maturity when it comes to use it, the majority of young people stated to be mature and in control of its use, similar to specialists' perception, *"the vast majority make responsible and healthy use of these tools"* (I1); even though some generalized symptoms were identified, such as lack of sleep, forgetfulness, nervousness in the face of the idea of not being able to use it or the necessity of using it as a distraction, *"the fact that someone has the thought of uploading a photo to Tuenti or Facebook at 3 am… to start tagging, it is hard"* (I3); *"as soon as a child's mobile breaks a big drama starts. They can't live without it"* (FG3).

RQ2 Which will be the most adequate items to customize a brief questionnaire that includes psychological, social and behavioral aspects that could underlie *smartphone* addictive behavior, as well as their reliability indexes?

The focus groups, along with the in-depth questions provided some insights that permitted understanding the psychodynamic of the *smartphone* addiction.

Using these results, and taking into account the previous analyzed studies from the bibliographic revision, the 9-items brief smartphone addiction questionnaire was designed, as shown below:

Table 2. *Smartphone addiction questionnaire proposal.*

Pseudonym	**No (never)**						**Always**
In a scale from 1 to 7	**1**	**2**	**3**	**4**	**5**	**6**	**7**
"I sleep with it and it can emit notifications at night"							
"I like to answer phone calls, messages, e-mails immediately… even if I am busy/doing something else"							
"It has bothered me being criticized for using it a lot every now and then"							
"I wish it did not take away so much time so that I could do more things"							
"Sometimes I use it a little bit behind my parents' back so they don't nag me"							
"I would feel lots of anguish if it were taken away							

from me"							
"I feel like an inner necessity of checking it frequently (check e-mails, my social networks…)"							
"I like a lot receiving calls o being texted or appearing on my friends' social networks"							
"The possibility of people saying bad things about me on social networks disturbs me"							

Source: own elaboration.

The descriptive analysis of the obtained items on its first implementation showed the higher values for the items "I feel the necessity of checking it frequently" (mean value=4.74), "I would feel lots of anguish if it were taken away from me" (mean=4.58) and "I like to answer immediately" (4.30). On the contrary, the lower values were for the items "Sometimes I use it a little bit behind my parents' back" (2.08), "It has bothered me being criticized for using it a lot" (2.47) and "The possibility of people saying bad things about me on social networks disturbs me" (2.52).

The reliability of the questionnaire was explored through *Cronbach* reliability test and the test-retest.

The *Cronbach* results are high (0.61; p <.000), especially for a brief scale, since the *Cronbach's Alpha* value usually increases with the size of the sample. This result indicates that the different items of the questionnaire manifested steady values and that they measure in a reliable manner what they intent to measure without creating random significant differences by the mere passage of time (Table 3).

Table 3. *ANOVA with Cronbach Test.*

		Sum of Squares	Dfach	Mean Square	Cochran's Q	Sig
Between People		387,382	63	6,149		
Within People	Between Ítems	546,406	8	68,301	159,357	,000
	Residual	1209,149	504	2,399		
	Total	1755,556	512	3,429		
Total		2142,938	575	3,727		

Source: own elaboration.

To evaluate the test-retest an analysis of the Pearson correlations was performed between the results of the questionnaire and the repetition of itself for each of the nine items. All the items showed significant correlations (p<.000).

The results of the correlations for each one of the items are shown below:

ITEM 1: .72
ITEM 2: .49
ITEM 3: .70
ITEM 4: .73
ITEM 5: .44
ITEM 6: .71
ITEM 7: .81
ITEM 8: .50
ITEM 9: .71

Finally, with the goal of analyzing the internal structure of the questionnaire and the possible psychological profiles of the users, a factor analysis was performed (Table 2) to help propose a psychological model of smartphone addiction.

Table 4. *Factor analysis components matrix.*

	Component			
	1	**2**	**3**	**4**
Sleep with it	,007	,062	,740	,016
Answer immediately	,549	,213	,163	-,398
Bothered by criticism	,444	-,567	-,088	-,051
Wish to make more use of it	,748	-,296	-,150	,215
Use it behind someone's back	,680	-,469	-,003	-,059
Anguish for being without it	,534	,250	,353	,126
Necessity of checking it	,665	,300	,206	-,247
Appear on social networks	,282	,784	-,003	,245
Fear of bad reputation	,342	,222	-,243	,745
Age	-,406	-,065	,414	,230
Sex	,034	,539	-,452	-,386

Source: own elaboration.

The analysis shows four factors that explain a total 61.15% of the variance:

Factor 1, the one we labeled "Immersive use". It is about subjects "immersed" in a constant activity with the mobile, which they probably use very frequently and for all types of activities. It seems to saturate in all the items of the questionnaire, except in the *necessity of sleeping with it*, which seems to indicate that it is a controllable behavior, not so impulsive to make people sleep with it and permitting it to wake the user up with the sound of notifications in the middle of the night.

Factor 2, labeled "Socializers". In this factor, the bigger interest seems to be "to stay connected to social networks, to be present". It seems to indicate that these are subjects whose main interest is socializing, to be present on social networks and also know what happens on them. It is interesting due to the fact they are users who saturate negatively in the item "receiving criticism for using it" and "using it behind someone's back": this could indicate that their need to socialize also expands to the real world since they neither receive criticism nor use it behind people's back, in contrast to what happened to the group of subject from factor 1 (immersive). Future studies could include personality or values variables that allow measuring the "tendency to socialize" or also, perhaps, the "tendency to be a leader", with the objective of analyzing the correlations with this factor.

Factor 3, labeled "Virtualized". Here, mobile, to a certain extent, "is part of their body" and they cannot ever separate from it, although without high levels of anxiety. They fundamentally saturate in the items "sleep with it" and "would feel anguish if they lost it". These are subjects that seem to be strongly motivated to use their mobile constantly or at least, to feel its physical presence by their side (*sleep with it, feel anguish if I lose it…*), but don't show anxiety by criticism on social networks or any other reason.

By the same token, future researches should include, when evaluating personality traits, evaluating the *anxiety* trait or similar, with the purpose of researching the possible interactions with this typology.

Factor 4, the one we labeled "Stressed". This factor saturates positively in "the fear of bad reputation" and negatively in "answer immediately". Therefore it does not seem like an impulsive behavior but a type of strong "concern" for cyberspace and social networks, which leads them to keep in touch with it more, but without the ludic component from the subjects we have labeled "Socializers".

These results seem to indicate, as we had hypothesized, that there are different "patterns" of mobile use, based on the psychosocial motivations that underlie its use and the perceived consequences: users of "immersive use", maybe the least prone to developing addictive or problematic behavior, "socializer" users, with a high social motivation and desire to interact with their peers, the "virtualized", highly involved on social networks, but without showing anxiety and, finally, the "stressed", maybe the most prone subjects to developing more pathological behaviors with the use of smartphones.

Therefore, more important than the high percentages of use as a global concept, it is perhaps necessary to start specifying *what type of use* the owner of the mobile makes, since there are, at least, four patterns of use clearly differentiated.

5. Discussion and limitations

The perception of the *smartphone* is of an attractive tool that facilitates socialization and communication, even though there are some recognized disadvantages like lack of privacy, change in the types of social relations, isolation and deterioration of social relationships (Urbina, 2014; Treviño, 2013). Young people are conscious that its accessibility and availability has facilitated their using smartphones daily, using them even in places where its use is forbidden and recognize their nervousness in the face of the idea of not being able to use it, an attitude also recognized by parents, however, they do not perceive this as a problem, making it seem normal. That is why both parents and educators roles are important, so young people make healthy use of the mobile, even though there are some challenges when showing the gap regarding knowledge and strategies of use between these and young people, just as it has been shown in our focus groups and in-depth interviews.

All of this is, on another note, coherent with recent data published thereon in similar studies (Observatorio Nacional de Telecomunicaciones y de la Sociedad de la Información [EN: Telecommunications and Information Society National Observatory], 2019; INE, 2019). This suggests the necessity of designing new communication strategies to educate, not only young people, but parents and educators as well about useful and responsible use of these devices.

The questionnaire about the use of the *smartphone* created in this research, obtained adequate reliability indexes for both internal consistency (*Cronbach's Alpha* index) and stability (Pearson correlations). Its construct, structural or factor validity (performed with factor analysis) seems adequate and provides psychosocial typologies of great interest, for both the fast type *screening* adequate diagnosis and the subsequent design of intervention programs. Previous studies mention high global percentages of mobile use (Herrera-Batista, 2009; INE, 2019) however, our data shows a variable figure of use depending on different "patterns", being necessary to specify the type of use the person makes of it, therefore there could be different types of consumers, surely with different addiction or intensive use patterns. Some of them, even if they made a very intensive use of it, it could not be stated, in a strict sense, as an addiction but *problematic consumption patterns of the mobile*, since they do not seem to generate anxiety nor link to other characteristic variables of addictions.

That way we could talk about young people who use it constantly, but with certain level of control over its use; the ones who use it to socialize, the ones who could not separate from it on a functional level and the ones concerned by what others say about them and their actions on the Internet and on social networks.

Future research with larger samples could help deepen in possible differences between these factors, especially if they are used in a complementary manner in measures of personality factors such as extroversion, emotional stability and social values measures, such as the pursuing of leadership or socializing. This would allow understanding better the psychological foundations of smartphone addiction permitting, not only defining the possible patterns of use, but also correlating them to particular psychological profiles, which would strengthen the questionnaire as an early detection tool of problematic use and would open new spaces to different types of treatments. In so doing, when being able to detect certain profiles associated to possible problematic use patterns, useful and effective strategies could be designed for education and prevention. In this sense, it is also necessary to research the differences in gender and their interactions with the factors found.

It will also be necessary to research the correlation between the high indexes of smartphone use and the concurrent external validity variables, such as school performance. It is very likely that the different patterns, some better than others, discriminate the impact on behaviors like school performance, anxiety, isolation, etc.

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