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## Miscellaneous

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**Submitted**  
May 17th, 2021  
**Approved**  
December 1st, 2021

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© 2022  
Communication & Society  
ISSN 0214-0039  
E ISSN 2386-7876  
doi: 10.15581/003.35.2.1-17  
[www.communication-society.com](http://www.communication-society.com)

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2022 – Vol. 35(2)  
pp. 1-17

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**How to cite this article:**  
López de Ayala López, M. C.,  
Catalina-García, B. & Pastor Ruiz, Y.  
(2022). Problematic internet use:  
the preference for online social  
interaction and the motives for  
using the Internet as a mediating  
factor. *Communication & Society*,  
35(2), 1-17.

## Problematic internet use: the preference for online social interaction and the motives for using the Internet as a mediating factor

### Abstract

The preference for online social interaction has been seen as an antecedent for problematic use of the Internet and social networks, which is associated with problems of social anxiety and a lack of social skills. Based on a survey with a representative sample of 524 students in Compulsory Secondary Education (aged 12–14) in the Autonomous Region of Madrid (Spain), the role of motives of use as a factor that explains the problematic use of the Internet has been analysed as a mediating component between such problematic use and the preference for online social interaction. The results show that only when social networks are used to expand relationships and as a form of self-expression are there negative consequences for the individual, but not when such networks are used to maintain close relationships. Finally, it has been observed that such motives, which moderately predict problematic use, only slightly explain in part the relationship between the preference for online social interaction and problematic use. Therefore, further research is needed to investigate other motives for use that mediate this association, as well as the connection between the motive to expand social relationships together with self-expression, and other pre-existing personality factors that might lead to problematic use of the Internet and social networks.

### Keywords

**Problematic social network use, motives for social network use, preference for online social interaction, adolescents, mediation.**

### 1. Introduction

Problematic Internet Use (PIU) can be defined as the inability of a person to control their own use of the Internet that leads to experiencing negative consequences in everyday life (Spada, 2014). Despite the problems experienced in daily life by people with PIU, it is not a pathology recognised as such by the major manuals of diagnostic criteria, such as the DSM-5 (American Psychological Association, 2013). Nevertheless, there are many scholars who have analysed this issue, and in the case of Spain, they have found a growing trend toward the risk of

compulsive Internet use among students from 14 to 18 years of age, which rose from 16.4% in 2014 to 20% in 2018 (*Observatorio Español de las Drogas y las Adicciones*, 2021).

Caplan (2002, 2010), who is one of the leading scholars in this field, considers that PIU is often related to interpersonal use of the Internet. This author designed and empirically validated a model that delimits the variables that explain how online social behaviour can be associated with negative consequences, the latter of which are understood as difficulties experienced by users in their social, familial, and even professional relationships as a result of excessive internet use. With this model, the preference for online social interaction (POSI) is the main antecedent variable which, together with the management of online emotions and difficulties in self-regulation, leads to experiencing negative consequences.

POSI refers to a predilection, or inclination, to establish and maintain social relationships by Internet rather than face-to-face. This is a cognitive construct characterised by beliefs regarding the extent to which a person feels safer, as well as more effective, confident and comfortable in online interaction (Caplan, 2002, 2010). This model has strong empirical support internationally (Barke, Nyenhuis & Kröner-Herwig, 2014; Fioravanti, Primi & Casale, 2013; Gámez-Guadix, Orue & Calvete, 2013) and is widely accepted at the present time.

On the other hand, it has been observed that the different motives and purposes for using social networks might reflect the particular needs and interests of individuals, but could also be related to their difficulties and problems in some cases. The uses and gratifications theory presumes that each individual decides what media and content they consume according to their needs and interests, which may be social or individual (Katz, Blumler & Gurevitch, 1974). Current research suggests that this selection of specific activities and media may also reflect problematic aspects of an individual's personality, since they select those that best suit their purposes (Kircaburun, Alhabash, Tosuntas & Griffith, 2020).

Many researchers have associated certain uses of the Internet, social networks and smartphones with problematic use and negative consequences on the health and emotional well-being of young people and adolescents (see Martínez-Pastor, Catalina-García & López de Ayala, 2019). For example, displacement theory states that the intensive use of digital devices and services takes time away from other tasks, generating isolation and psychological difficulties (anxiety, depression, and low self-esteem). Hence, the addictive use of social networks has been associated with loneliness (Tokunaga, 2017), poor academic performance (Liu, Kirschner & Karpinski, 2017), and sleep disturbances (Lemola, Perkinson-Gloor, Brand, Dewald-Kaufmann & Grob, 2015), among other problems.

On the other hand, compensation theory (Valkenburg & Peter, 2011) links pathological Internet use with unfulfilled social needs in face-to-face relationships, which are associated with social anxiety problems and a lack of social skills. According to this theory, people with this predisposition take advantage of anonymity, the absence of eye contact, and the immediate, spontaneous response of the Internet to seek refuge and isolate themselves in a world where they find it easier to control their communication and self-presentation (López de Ayala *et al.*, 2015). Consequently, they develop a preference for online social interaction (Caplan, 2007) and the loss of control over online behaviour (Casale & Fioravanti, 2018). This thesis is consistent with the uses and gratifications theory and suggests that the types of uses chosen, including those that are problematic, as well as the platforms and services selected, arise from needs, or deficiencies, that must be satisfied. This has been expounded by Kardefelt-Winther (2017), who approaches Internet use as a coping mechanism to escape from real-life problems or to alleviate dysphoric moods, which can sometimes lead to negative consequences. In line with these contributions, this paper aims to find an association between the motivations for using social networks and problematic Internet use.

### 1.1. *Motives for using social networks*

The classification and description of motivations for using social networks is varied in the academic literature. Studies tend to distinguish between two main categories of motives: those with objectives that are communicative, and those with non-communicative aims. In this context, Lee, Lee, Moon and Sung (2015) reflect this distinction, specifically regarding the use of Instagram. On the one hand, motivations related to communication exist, such as social interaction and the ability to express oneself. On the other hand, non-communicative motives also exist, such as image storage, escapism, and viewing the content posted by others in order to stay informed. According to Kircaburun, Jonason and Griffiths (2018), Instagram is the most preferred way for university students to present their best attributes. Rodgers *et al.* (2020) also argue that the pursuit of popularity and appearances are the main incentives for adolescents to use social media. This trend indicates a greater need for communication when one reaches the period of youth (Punyanunt-Carter, De la Cruz & Wrench, 2017), although within this age group, the need to promote learning among university students is noteworthy as well (Yuksel & Kutler, 2016).

For their part, Chen *et al.* (2017) suggest four main motives for using the Internet: enhancement, in the sense of the enjoyment users perceive when surfing the net; coping, which includes both managing mood changes and entertainment as a strategy to combat boredom; social motives, which include establishing and maintaining social relationships; and motivations related to conformity and tolerance of one's peers. Clearly, the two latter motives are the ones that can be integrated specifically into the communicative domain, in the sense of contact with the user's environment. However, other authors place entertainment within the category of social use as well (Bischof-Kastner, Kurtsche & Wolstein, 2014).

Regarding entertainment in particular, which has been defined by Al-Menayes (2015) as an activity to pass the time when there is nothing to do, is one of the main motivations among adolescents and young people. Indeed, Mulawarman, Hudab, Suharsoc and Muslikahd (2020) have found that secondary school students use social media mainly for entertainment purposes, and secondly as a source of information and to promote their social life, yet the former is their main reason for accessing social networks (Alhabash & Ma, 2017). Furthermore, Leung (2007) notes that this motivation, together with maintaining social relationships, offsets the stress that might be experienced by adolescents and children between the ages of 8 and 18. In both cases, contact with others and entertainment provide short-lived relief in transitory stages of anxiety or discomfort.

From a social perspective, Throuvala, Griffiths, Rennoldson and Kuss *et al.* (2019) note that communication with their surroundings satisfies personal expression and peer approval. In general, this is an emotional need that becomes more acute in adolescence. Thus, social networks are an effective tool of communication at this age, which also reinforces influences they might receive from the outside (García del Castillo, García del Castillo-López, Días & García-Castillo, 2019).

With regard to gender, Colás and González de Pablos (2013) have observed that girls are more motivated by relationships, and they use networks to make new friends, while boys are more motivated by the personal gratification they obtain from the responses of their friends to the content they upload. In either case, interaction with the social environment is the key that both genders have in common. Mancinelli, Bassi and Salcuni (2019) have observed a similar trend: females have more friends on social networks and are more likely to post their own images because they are more motivated by closeness, as opposed to the personal rewards to which males aspire. Prades and Carbonell (2016) add to this gender distinction the fact that females are more curious about what other people are doing.

## 1.2. *Motives associated with problematic use*

The association between motives for using social networks and problematic internet use is a fairly recent field of study. For example, although they used a very small sample of adolescents in Turkey, researchers Yildiz-Durak, Saritepeci and Durak (2019) found that students with a high level of social motivation for media use had more problematic use as well. Other authors link problematic use to the adolescent need for social approval, which results in a stronger fixation on the *likes* they receive (Chen, 2019; Martínez Pecino & García Gaviñán, 2019). Along the same lines, Andreasen, Pallesen and Griffiths (2017) suggest that the addictive use of social networks reflects the need to nourish the ego, and is also an attempt to inhibit negative self-evaluation. This is in line with the model proposed by Caplan (2002, 2010), which argues that one of the main antecedents of problematic internet use is a preference for online social interaction (POSI).

Based on the uses and gratifications theory, Sheldon and Newman (2019) have also noted that the excessive pursuit of self-assurance by adolescents who repeatedly seek positive feedback and interpersonal rejection are indications of excessive Instagram use. This need for validation makes them more creative in posting content, but it also increases the likelihood of seeking social support as *misfits*, a factor associated with compulsive mobile phone use (Wang, Wang, Gaskin & Wang, 2015), and an enhanced perception of social networks as a refuge they can use to protect themselves from their environment (Durak, 2020).

However, there is no agreement in the literature on which motives are associated with a higher incidence of problematic use. Indeed, authors such as Stockdale and Coyne (2020) associate it more with social connection, and secondly, with the relief of boredom. Yet Kim, LaRose and Peng (2009) suggest that the connection with social relationships is no closer than with entertainment –both motives have a similar degree of association, especially in individuals who have adjustment difficulties (Lupano & Castro, 2020). Along these lines, and in the context of the confinement resulting from the COVID-19 pandemic, Catedrilla *et al.* (2020) consider that the relief of boredom exacerbated problematic use of social networks. However, in this exceptional situation, Venuleo, Marino, Ferrante, Rollo and Schimmenti (2020) confirm that the Internet has been perceived as a crucial support for stress relief, regardless of the motives associated with its use.

In the specific case of Facebook, Marino, Mazzieri, Caselli, Vieno and Spada (2018) conclude that coping (as a way of forgetting about worries) and self-improvement (due to the excitement of accessing this network), are psychological motivations that may lead to compulsive use. In a more general context, Franchina, Vanden Abeele, van Rooij, Lo Coco and De Marez (2018) have found FoMO (Fear of Missing Out) to be a factor that predicts *phubbing* and problematic social media use, especially those considered by adolescents to be more private, such as Facebook and Snapchat, as opposed to YouTube and Twitter, which have content that may be more public and outside the immediate environment to a greater extent.

As we have pointed out, there are several studies that link problematic Internet use to the motives for using social networks. However, we have not found any studies that associate the variables in the model by Caplan (2010) to motives for using social networks. Based on the studies reviewed, we can hypothesise that motives for using social networks might act as mediators between POSI and compulsive or problematic use.

Accordingly, the main objective of this paper is to delve into the process by which the preference for online social interaction influences negative consequences of internet use, and we have done so by examining whether the motives of use mediate between the two, as suggested by Kardefelt-Winther (2017). To this end, we have first identified the main motives for social network use among adolescents, and secondly, the influence of gender, age, and time of use on these motives. We have also explored the preference for online social

interaction, and motives for use, with regard to their effect on negative internet use, examining whether there is evidence of interaction between the first two in their relationship with the latter. Finally, we have analysed the mediating effect of motives of use on the association between POSI and the negative consequences of social network use.

## **2. Materials and method**

### **2.1. Participants and sample**

This study is based on a statistically representative sample of students in Compulsory Secondary Education (*ESO*) in the 2019–2020 academic year in the Autonomous Region of Madrid. The sample consists of 524 adolescents, with a mean age of 13.57 years ( $SD= 1.24$ ; range= 12–17 years). A total of 48.9% were girls, and the distribution by year was as follows: 26.7%, first year; 26.5%, second year; 24.8%, third year; and 21.9%, fourth year of Secondary School.

The sample design consisted of a stratified, multi-stage clustering procedure (Secondary Schools). In the stratification, a proportional allocation was applied according to the type of school (public, 33% of the students; private, 22.7%; and subsidised, 44.3%), and according to whether they were located in the City of Madrid (38.4%), or in the rest of the municipalities in the Autonomous Region of Madrid (61.6%). In the initial phase, based on lists of Secondary Schools in the Autonomous Region of Madrid, sixteen educational centres were selected using a random number table, maintaining the weight according to the distribution of students by school type, and between The City of Madrid and the rest of the municipalities. In turn, within the schools, the classrooms that participated in the survey were also randomly selected, maintaining quotas by year. The error was set at  $\pm 4.37\%$  for the overall data under the assumption of  $p=q=0.5$ , with a confidence level of 95%, and under the assumption of simple random sampling.

### **2.2. Procedure**

The procedure of this research was favourably assessed by the Comité de Ética de la Investigación (Research Ethics Committee). Firstly, the centres were contacted and informed of the nature of the research, and their authorisation was requested. Next, the questionnaire was conducted in the classrooms using the CAPI interview system by professionals from a research company, and the only questionnaires used were those of students who had provided informed parental consent, if they were under 14 years of age, and personal informed consent from that age onward. Fieldwork was conducted between 24 October and 19 December of 2019.

### **2.3. Variables and instruments**

The variables analysed were the following: gender (1= male; 2 = female); year (years 1, 2, 3, and 4 of Secondary Education, which is an approximate indicator of age); time spent on social networks (6= continuously; 1= less than one day a week); motives for using social networks; preference for online social interaction; and the negative consequences of Internet use.

#### **2.3.1. Motivations for using the Internet**

Motives for internet use were assessed with a 14-item, self-administered questionnaire that registered motivations for using social networks. On a 5-point scale, respondents rated the frequency with which they used social networks for different reasons (1=never; 5=continually). The items were designed after conducting an in-depth literature review on the topic, in addition to four focus groups with adolescents. The scale included aspects regarding relations with close contacts (items 1 and 2), entertainment (items 6 and 7), information (8 and 10), exploring the environment (3 and 14), expanding one's network of relationships (4 and 13), expression and support (11 and 12), showing one's skills (9), and flirting (5).

To simplify the number of motives and facilitate the interpretation, an exploratory factor analysis based on the main components was carried out with these items. This statistical method describes the variability between the correlated variables observed and creates a model as a combination of potential factors, thereby avoiding redundancies and revealing the underlying latent structure inferred from the most easily measured set of items, which in this case are the motivations to connect to networks and social media. To extract the factors, eigenvalues greater than one were selected. The resulting model explained 64.2% of the variance. Bartlett's test of sphericity is significant (3430.508;  $df = 91$ , Sig. = .000), and the result of the sample size adequacy indicator yielded an adequate rating (Kaiser-Meyer-Olkin = 0.904). The programme provided a final, three-dimension model that synthesised the information. In order to improve the interpretation of the results, a varimax rotation was applied to the factors obtained. In this way, the attributes that define each of the three factors obtained could be more clearly delimited and interpreted following the criterion of selecting scores higher than 0.5. The results are shown in Table 1.

**Table 1:** Motives for using social networks: exploratory factor analysis.

	1	2	3
Stay in touch with friends, family and people around me		.735	
Stay up-to-date on what is happening with my friends and acquaintances		.702	
Pass the time		.751	
To entertain myself and/or disconnect		.765	
Meet people and expand my network of friends	.757		
To flirt	.726		
Show my skills	.671		
To be able to express my feelings and opinions	.758		
To talk about my problems and/or ask for advice	.784		
Expand my network of followers	.783		
Stay up to date with what is happening in the world			.661
Search for interesting information			.792
Search for useful information			.849
Learn about other opinions and ways of thinking			.538
<i>Eigenvalues</i>	6.020	1.916	1.045
Explained variance	26.95	19.4	17.77
Range	1-5	1-5	1-5
Mean	3.09	3.8	2.2
SD	1.00	.99	1.00
Cronbach's Alpha	.874	.803	.814

Note: Extraction method; principal component analysis. Rotation method: Varimax with Kaiser normalisation. Rotation has converged in 5 iterations.

Source: Own elaboration.

Based on the analysis carried out, the resulting factors or dimensions in the motives for using social networks among adolescents in Madrid are as follows:

- Factor 1.- Expand social relationships and expression, with scores above .5 in the following: expand my network of followers; talk about my problems and/or ask for advice; meet people and expand my network of friends; be able to express my feelings and opinions; to flirt; to show my skills.

**the preference for online social interaction and the motives for using the Internet as a mediating factor**

- Factor 2.- Close relations as entertainment: to stay in touch with friends, family, and people around me; stay up-to-date with what is happening to my friends and acquaintances; to pass the time; to entertain myself and/or disconnect.
- Factor 3.- Informative uses: to search for useful information; to search for interesting information; stay up-to-date with what is happening in the world; to learn about other opinions and ways of thinking.

**2.3.2. Negative consequences of social network use**

In order to assess the negative consequences of using the Internet and social networks, we used the Spanish adaptation (Gámez-Guadix *et al.*, 2013) of the negative consequences subscale belonging to the Generalised Problematic Internet Use Scale (GPIUS-2, Caplan, 2010). This subscale is composed of three items, with responses ranging from 1 (strongly agree) to 6 (strongly disagree), and it achieved a reliability level of .82 (Cronbach's alpha). For the analysis, this variable was dichotomised, so that subjects with scores at or below the sample mean ( $M = 2.22$ ,  $SD = 1.34$ ) were placed in the group with low negative consequences ( $n=304$ , 58%), and those with scores above the mean were placed in the group with medium-high negative consequences ( $n=220$ , 42%).

**2.3.3. Preference for online social interaction**

As with the previous variable, the assessment of preference for online social interaction was based on a subscale from the Spanish adaptation (Gámez-Guadix *et al.*, 2013) of the Generalised Problematic Internet Use Scale (GPIUS-2, Caplan, 2010). This subscale consists of three items (1, 6 and 11), the response of which include options between 1 (strongly agree) and 6 (strongly disagree), and it obtained a Cronbach's alpha of .85 for our study, with a mean of 2.47 and a standard deviation of 1.45.

**2.4. Analysis**

The data obtained from the survey have been analysed with the statistical programme SPSS, v.27, and the level of statistical validity has been established at  $p\text{-value} < .05$ .

Firstly, the percentages of frequency with which adolescents in Madrid connect to social networks and social media for different reasons are described. With the aim of carrying out a more exhaustive description of motives, all of the items were used. To analyse differences between males and females, we used the non-parametric Mann-Whitney U test, which is suitable for determining whether differences in the medians of an ordinal variable, or which do not follow a normal curve, can be inferred for the population as a whole. Effect size was calculated using the Rosenthal correlation test ( $r_{\text{Rosenthal}}$ ), which divides the standardised test statistic by the square root of the sample size (Rosenthal, 1991), and the interpretation was made according to Bartz's rule (1999, p. 184):  $0.00 < 0.20$ , very low;  $0.20 < 0.40$ , low;  $0.40 < 0.60$ , moderate;  $0.60 < 0.80$ , strong;  $0.80 < 1.00$ , very strong. Goodman and Kruskal's Gamma ( $\gamma$ ) was used to measure the association between the motives for use and the school year/time of use, all of which are ordinal variables. This test uses a value from 0 to 1, ranging from no association to a perfect association. Finally, an analysis of the relations between ordinal variables and quantitative variables was carried out using Spearman's correlation coefficient ( $r_s$ ), which is suitable for data distributions that do not follow the normal curve. The interpretation of Gamma values and Spearman's correlation was performed according to the rule of Rea and Parker (1992):  $< 0.10$ , insignificant;  $0.10\text{--}0.20$ , weak;  $0.20\text{--}0.40$ , moderate;  $0.40\text{--}0.60$ , relatively strong;  $0.60\text{--}0.80$ , strong;  $> 0.80$ , very strong.

Next, a binary hierarchical logistic regression analysis was conducted to identify whether preference for online social interaction, together with the control variables (gender, school year, and time of use) have an effect on the negative consequences of internet use, as well as to explore whether the inclusion of a second block with motives for use significantly improves

the prediction of the occurrence of high or medium-low negative consequences. As we were going to use an explanatory model, and not a predictive one, we applied the Enter method, which keeps all the variables in the model and allows us to know which factors are significant. Two blocks were included: a first block with the control variables and the variable related to preference for online social interaction (POSI), and a second block with the dimensions resulting from the factor analysis of the motives for use.

In order to analyse the possible mediation of usage motives in the association between POSI and negative consequences, we used the module extension Process macro for SPSS v3 from Hayes (Model 4). This uses a bootstrapping strategy, which is a resampling technique that allows us to examine the significance of effects to obtain robust standard errors for parametric estimation (Hayes, 2013). The bootstrapping method produces 95% bias-corrected confidence intervals of these effects from 10,000 resamples of the data. The mediation-oriented Process macro module is used to delve deeper into the mechanisms that explain the relationship between two variables, one independent and one dependent, which has allowed us to progress in the processes that explain that relationship. Non-zero confidence intervals indicate significant effects at  $\alpha = 0.05$  of the indirect effect, which quantifies the effect of the independent variable (preference for online social interaction) upon the independent variable (negative consequences of online use) through the mediating variable (motives for use).

### 3. Results

#### 3.1. *Motives for social network use: predictive factors; the association with preference for online social interaction*

An initial analysis of the reasons why young people connect to social networks and social media (see Table 2) shows that the most frequent motives are the following: to stay in touch with their immediate environment –more than 70% do so continuously or very frequently; to entertain themselves and pass the time –around 65% do so frequently; and to stay up-to-date with what is happening with their friends and acquaintances, 59%. By contrast, 78% never or rarely go online to flirt; only 13% go online to show their skills continuously or very often; 17% go online to talk about problems or ask for advice; and 19% go online to expand their network of followers and show their skills. Gender differences, although significant (see Table 2: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ), are very low, with girls going online slightly more frequently than their male counterparts to express feelings and opinions ( $r_{\text{Rosenthal}} = .11$ ), to learn about other opinions or ways of thinking, to stay in touch with friends, family and their environment ( $r_{\text{Rosenthal}} = .10$ ), and to flirt with boys ( $r_{\text{Rosenthal}} = -.14$ ).

**Table 2:** Frequency of connecting to social networks for different motives (%), differences by gender (Mann-Whitney U), and association by school year, time of use, and preference for online social interaction (POSI) (Goodman-Kruskal gamma).

	1	2	3	4	5	Gender (z-value)	School year ( $\gamma$ )	Time of use ( $\gamma$ )	POSI ( $\gamma$ )
1. To stay in touch with friends, family, and people in my surroundings	7	5.6	13.8	31.3	42.3	2.356*	.11*	.34***	.056
2. Stay up-to-date on what is happening with my friends and acquaintances	12.2	7.4	21.7	30.4	28.2	1.542	.11*	.48***	.143**
3. Stay up-to-date with what is happening in the world	13.7	19.1	25.6	23.4	18.3	0.692	.21***	.29***	.125**
4. Meet people	34.4	23.3	19.7	12.1	10.6	0.482	.21**	.44***	.321***
5. To flirt	61.9	16.4	11.3	5.2	5.3	-3.257**	.28***	.37***	.252***
6. To pass the time	7.8	6.8	21.9	31.1	32.4	0.382	.19***	.42***	.178***
7. To entertain myself and disconnect	8.8	6.5	19.5	31.3	34.2	-0.814	.18***	.36***	.130**
8. Search for interesting information	9.4	14.4	28.2	31.7	16.3	0.318	.11*	.24***	.091*
9. Show my skills	40.2	22.9	24	7.1	5.8	-1.854	.07	.30***	.286***
10. Search for useful information	12.9	11.3	29.5	31.2	15.1	0.503	.11*	.11*	.014
11. Express my feelings and opinions	36.9	25	17	12.1	9	2.626**	.12*	.37***	.286***
12. Talk about my problems and ask for advice	47.5	21	14.6	9.1	7.8	1.638	.06	.29***	.192***
13. Expand my network of followers	45.4	19.5	16.2	9.7	9.3	-0.576	.15**	.50***	.330***
14. Learn about other opinions and ways of thinking	22.4	23.2	28.4	15.6	10.4	2.444*	.26***	.38***	.170***

Note: 1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Very frequently; 5 = Continuously. z-value of the Mann-Whitney U test;  $\gamma$  = Goodman-Kruskal Gamma (Gamma); \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Source: Own elaboration.

In terms of school year, the frequency with which they say they go online for all reasons increases as the year increases, except for showing their skills and talking about problems or asking for advice, which shows no significant differences. At the same time, the motives for which the most significant differences for the variable associated with age are to flirt and to learn about other opinions or ways of thinking, with a moderate positive association (Gamma > 0.20).

Regarding time of use, we found a relatively strong positive association between time of use and frequency of connection to expand the network of followers, keep up to date with what is happening to friends and acquaintances, meet people, and pass the time (Gamma > 0.40). This association was somewhat more moderate about the following motives: getting to know other opinions or ways of thinking, expressing feelings and opinions, flirting, entertainment and disconnection, and keeping in touch with friends, family and close surroundings (Gamma between 0.30 and 0.40).

Finally, we found a moderate positive association between the preference for online social interaction and, from highest to lowest degree of association, the frequency of connection to expand the network of followers, meet people, show one's skills, express feelings and opinions, and flirt (see Table 2).

### 3.2. Motives for use as an explanatory factor for problematic internet use: its mediating role

The next step was to conduct a binary logistic regression analysis to identify whether the preference for online social interaction (POSI), together with the control variables (gender, age and time of use), can explain the negative consequences of Internet use. In a second model, we examined whether the inclusion of use motives improves the model and its influence on the effect of preference for online social interaction on negative consequences.

The results of the analysis show that in Model 1, only time spent using social networks and, above all, the preference for online social interaction explain high or low negative consequences ( $p < .05$ ), so the probability of manifesting high negative consequences of internet use increases with more time spent using social networks (with a measure of association - Exponential B Odds ratios - of 1.26), and a greater preference for online social interaction (Exp B= 2.81). Model 1 shows a good chi-square fit ( $\chi^2=216.753$ ;  $gl=6$ ,  $p< .001$ ), and the level of explanation of the model is adequate, according to Cox and Snell's  $R^2$  ( $R^2=.34$ ) and Nagelkerke's  $R^2$  ( $R^2=.46$ ).

In this second model, in addition to time of use and preference for online social interaction, the motivation to expand social relationships and expression showed a significant positive association with the negative consequences of social network use ( $p < .05$  and odds ratios of 1.24 and 2.71, respectively). However, introducing the variables related to motives only slightly alters the influence of preference for online social interaction, which remains high. This model has a good fit ( $\chi^2=233.953$ ;  $gl=9$ ,  $p< .001$ ), with a good level of explanation, but hardly improves on the previous model, according to Cox and Snell's  $R^2$  ( $R^2=.36$ ) and Nagelkerke's  $R^2$  ( $R^2=.48$ ).

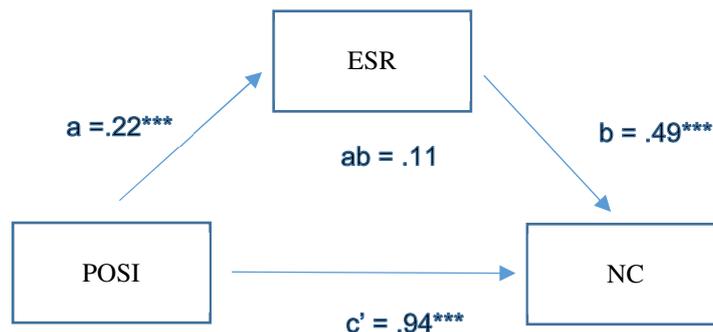
**Table 3:** Test of the mediation effect of factored motives for use and POSI on the negative consequences of internet use.

	Model 1				Model 2			
	B	Standard deviation	Sig.	Exp(B) Odds ratios	B	Standard deviation	Sig.	Exp(B) Odds ratios
Gender	.251	.229	.273	1.285	.335	.235	.153	1.398
School year			.225				.231	
Year (1)	-.392	.326	.229	.676	-.326	.336	.331	.722
Year (2)	.150	.322	.642	1.161	.225	.334	.500	1.252
Year (3)	.217	.330	.510	1.243	.273	.344	.427	1.314
Time of use	.229	.066	.001	1.258	.218	.074	.003	1.243
POSI	1.032	.098	.000	2.808	.996	.099	.000	2.707
Expansion of SR and expression					.375	.123	.002	1.455
Close relations					-.258	.133	.052	.772
Search for information					.183	.121	.130	1.201
Constant	-			.015	-4.269	.559	.000	.014
Cox y Snell's $R^2$	.34				.36			
Nagelkerke's $R^2$	.46				.48			

Source: Own elaboration.

Finally, the results of the mediation analysis using Process macro, following the bootstrapping method, showed that the indirect effect (ab) of preference for online social interaction on high or low negative consequences through use motives was statistically significant;  $ab = .11$ ,  $SE = .03$ , 95% CI = [.05, .18]. However, the mediation effect was much smaller than the direct effect of preference for online social interaction, which is  $.95$ ,  $SE = .09$ , 95% CI = [.76, 1.13]. Moreover, the total effect could not be calculated with dichotomous variables.

**Figure 1:** Mediation model of the motive to expand social networks and expression between preference for online social interaction and high or medium-low negative consequences.



Note: POSI = preference for online social interaction, ESR = motivation for expanding social relations and expression, NC = high or medium-low negative consequences \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Source: Own elaboration.

From the aforementioned analysis, it can be concluded that the preference for online social interaction influences the occurrence of serious negative consequences, but the indirect effect indicates that this association is explained in a very small percentage by the motivations for accessing social networks to expand social relations and expression exhibited by adolescents. Moreover, the preference for online social interaction has an even stronger effect, which means that it can be manifested by other motives of use.

Finally, the category of close relationships as entertainment does not show a significant effect on negative consequences (b) ( $p = .33$ ), so this analysis has not been included.

#### 4. Conclusions and discussion

In line with previous studies (Alhabash & Ma, 2017; Al-Menaye, 2015; Mulawarman *et al.*, 2020), our results show that the main motives for social network use among adolescents in Madrid are for social contact with the people in their environment, entertainment, and passing the time. This indicates that social networks are a very useful tool for adolescents, both for coping with stress or loneliness (Leung, 2007), and for their own personal, social and emotional development, given the fact that they find in such networks a place for personal expression and validation of their own self-conception (García del Castillo *et al.*, 2019; Throuvala *et al.*, 2019). For this reason, it is worth highlighting the positive role that social networks may have played in mitigating the effects of confinement during the pandemic among this age group (Venuleo *et al.*, 2020), despite the fact that the effort to combat boredom may also have encouraged problematic use in these circumstances (Catedrilla *et al.*, 2020).

Gender differences in motivations for social network use are of a low magnitude. As in previous studies (Colás & González de Pablos, 2013; Mancinelli *et al.*, 2019; Prades & Carbonell, 2016), girls seem to have a higher level of interest in relationships. However, the study herein has not detected the same effort among boys for this type of personal fulfilment, as other studies have found, although it is possible that the higher motivation among boys to flirt through networks could be an indirect reflection of this aspect.

As the age of the teenagers rose, the frequency of motivations for using social networks generally increased as well. This reflects a growing interest and an increase in time using networks. In this sense, motives linked to social contact and the struggle against boredom seem to have a stronger influence on time of use (Alhabash & Ma, 2017; Al-Menayes, 2015; Leung, 2007; Mulawarman *et al.*, 2020).

With regard to the association between the preference for online social interaction (POSI) and the motives for using social networks, a low to moderate relation with the different motives has been noted, with the exception of maintaining offline social contact or searching for useful information. Given that a preference for online social interaction is one of the early indicators of problematic internet use, this may indicate that when these two motivations are dominant, they might foster healthier social network use in adolescence. Conversely, motives that are moderately related to POSI, such as connecting to expand one's network of followers, meeting people, showing one's skills, expressing feelings and opinions, and flirting, might encourage more problematic use of social networks. Thus, knowing the motives for use might allow us to discriminate between adolescents at greater or lesser risk of developing problematic use, and consequently, psycho-educational measures could be developed to promote healthy motives to prevent negative use.

The comparison between the motives that explain the time of use and the preference for online social interaction allows us to propose that aspects related to the connection with one's close surroundings (staying in contact with friends and staying up-to-date with things that happen to them) and entertainment (passing the time, being entertained, and disconnecting) score high in time of use, but they have a relatively low weight on the POSI. On the other hand, aspects related to expanding social relationships (expanding one's network of followers, meeting people, or flirting) and expression (expressing feelings and opinions, showing one's skills), are strongly related to both. These results are in line with studies that associate problematic use with social motivation (Yidiz-Durak *et al.*, 2019), the need for social approval (Chen, 2019; Martínez Pecino & García Gaviñán, 2019), or the need to nourish the ego (Andreasen *et al.*, 2017), and they support research that leans toward social motivation over entertainment as factors associated with problematic use (Stockdale & Coyne, 2020; Kim, LaRose & Peng, 2009).

A first logistic regression model confirms that more time spent using social networks during adolescence and, to a greater extent, a stronger preference for online social interaction are associated with greater negative consequences of Internet use. These results are fully in line with the model of problematic use by Caplan (2010), as well as all related research (see, for example, Gámez-Guadix *et al.*, 2013).

To decipher which of the motives for using social networks are associated with negative consequences of internet use, and to discover indications that these motives might be capable of mediating the relationship between preference for online social interaction and negative consequences, a second logistic regression model was tested. The results suggest that the group of motives that refer to expanding social relationships and expression might be indicators of problematic internet use, as they appear to be associated with greater negative consequences of internet use. However, its inclusion in the model does not seem to have a notable impact on the influence that online use of POSI has on negative consequences, which suggests that there is scarce mediation of use motives in this association, nor do they change the association with time of use at all. The mediation analysis with the Process macro confirms the limited effect that the mediating role of the motives of social network use exerts on the association between POSI and negative consequences. This refutes the initial hypothesis and highlights the need to further develop the design of additional instruments to assess the motives for using social networks that are more specifically related to POSI, such as the avoidance of face-to-face relationships or the reduction of social anxiety, which would

complement the results of the study herein that are aimed more at identifying general motives for using social networks.

Likewise, the model on problematic internet use (Caplan, 2010) focuses on the study of how certain problems that lead to a preference for online social interaction result in problematic use. According to Wegmann and Brand (2019), this is consistent with the hypothesis known as the Fear-driven, or Compensation-seeking model. However, in their review study, these authors emphasise that addiction or problematic use of social networks can also develop in individuals who are socially integrated and active; for example, through self-presentation, popularity, and impression management, or in other words, by assuming the reward-driven hypothesis (Wegmann & Brand, 2019). In our work, it is probable that the set of motives related to the expansion of social relations and expression belong instead to the area of gratification, which adolescents are able to obtain from social networks as positive reinforcement, and not so much as a compensation for personal deficiencies. Therefore, this could explain the low association between motivations and POSI, even though there is a high association between motives and negative consequences.

It is worth highlighting the absence of an association between motives and close relations as entertainment, which we anticipate being healthier than other types of motivations. However, this is a hypothesis for future work. In fact, researchers have become engrossed in the study of all problems that have arisen from the misuse of the Internet (bullying, addiction, problematic use, etc.), and therefore, there is hardly any information on possible indications of the healthy use of Internet and social networks. This line of research, in which motives might play an important role in predicting use, represents a challenge for future exploration.

One of the limitations of this study is its demarcation within the Autonomous Region of Madrid, even though the sample is representative. Another limitation is the fact that it is cross-sectional, which does not allow us to draw conclusions of a causal or predictive nature, but merely associative. The main contribution of this study is to help decipher the role that motives for social network use might play in the development of problematic use of these same networks, and to highlight the need to improve and delve deeper into this line of research. Knowing the motives associated with problematic use of the Internet and/or social networks will allow us to detect at-risk adolescents early on and design preventive programmes aimed at promoting the healthy use of technology.

This article was prepared within the framework of the project “Nuevos escenarios de vulnerabilidad digital: alfabetización mediática para una sociedad inclusiva” (New Scenarios of Digital Vulnerability: Media Literacy for an Inclusive Society) Program PROVULDIG2-CM (H2019/HUM-5775).

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