

## Grooming online, sexting and emotional problems in Argentinean adolescents

### Grooming online, sexting y problemas emocionales en adolescentes argentinos

### Grooming online, sexting e problemas emocionais em adolescentes argentinos

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**Abstract:** Online grooming towards children and adolescents is a very serious problem. Thus, the objective of this research was to measure levels of online Grooming suffered and if gender, age, sexting and emotional problems (depression and anxiety) were predictors of such behavior. An intentional sample of 727 adolescents between 12 and 16 years old (59% women) was constituted from two private schools in the city of Paraná, Argentina. 20% of grooming cases were detected - at least once in the last year -, with 17% receiving solicitations by adults and 12% interactions. More men than women suffered from grooming -albeit marginally- and interactions. Besides, at older teenagers, grooming, requests and interactions increased linearly. From hierarchical regressions it was observed that a variance of 23% was predicted for grooming, 22% for requests and 23% for interactions, with age, depression and sexting being significant predictors. These results would indicate that this problem presents alarming percentages in said population.

**Key Words:** grooming, sexting, emotional problems, gender, age.

**Resumen:** El grooming online hacia niños y adolescentes es una problemática de suma gravedad. El objetivo de esta investigación fue medir los niveles de grooming online padecido y si el género, la edad, el sexting y los problemas emocionales eran predictores de dicha conducta. Se constituyó una muestra intencional de 727 adolescentes entre 12 y 16 años (59% mujeres) de dos escuelas privadas de la ciudad de Paraná, Argentina. Se detectó un 20% de casos de grooming, con 17% recibiendo solicitaciones por parte de adultos y un 12% de interacciones con adultos. Más varones que mujeres sufrían de grooming –aunque marginalmente- e interacciones. También a mayor edad de los adolescentes se incrementaba linealmente el grooming, las solicitaciones e interacciones. Se observó que se predecía una varianza del 23% para el grooming, de 22% para solicitudes y 23% para interacciones, con la edad, la depresión y el sexting como los predictores significativos. Los resultados indicarían que esta problemática presenta porcentajes alarmantes en dicha población.

**Palabras Clave:** grooming, sexting, problemas emocionales, género, edad.



**Resumo:** O grooming online para crianças e adolescentes é um problema muito grave. O objetivo desta pesquisa foi medir os níveis de grooming online sofridos e se o gênero, a idade, o sexting e os problemas emocionais eram preditores de tal comportamento. Foi constituída uma amostra intencional de 727 adolescentes de 12 a 16 anos (59% mulheres) de duas escolas particulares da cidade do Paraná, Argentina. Foram detectados 20% de casos de grooming, com 17% recebendo solicitações de adultos e 12% de interações com adultos. Mais homens do que mulheres sofreram grooming - embora marginalmente - e interações. Além disso, com o aumento da idade dos adolescentes se incrementaram linearmente o grooming, as solicitações e as interações. Observou-se que o resultado previa uma variância de 23% para grooming, 22% para solicitações e 23% para interações, com a idade, a depressão e o sexting como preditores significativos. Os resultados indicam que este problema apresenta percentuais alarmantes na referida população.

**Palavras-chave:** grooming, sexting, problemas emocionais, gênero, idade.

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Online grooming is defined as a process through which an adult with information and communication technologies (ICT) tries to gain the trust of a child or adolescent to create or maintain sexual contact online or - later - in person (Kloess, Beech, & Harkins, 2014; Smith, Thompson, & Davidson, 2014; Wurtele & Kenny, 2016). The process of online grooming towards children and adolescents by adults is made up of two aspects: solicitation by adults, on one hand, and online sexual interaction with them, on the other. The first consists of requests to engage in sexual activities, conversations or for the exchange of personal sexual information (Mitchell, Finkelhor, & Wolak, 2007), while the second consists of interactions of an adult towards the child or adolescent (Gámez-Guadix, De Santisteban, & Alcazar, 2017).

The difference in power between children or adolescents and adults can make adolescents more vulnerable to sexual contact with adults and to handle such contacts in an inappropriate way, due to their lack of cognitive and emotional maturation (McRae et al., 2012; Wolak, Finkelhor, Mitchell, & Ybarra, 2010). For example, it was detected that adolescent depressive symptoms were associated with a higher risk of suffering sexual solicitations (Ybarra, Leaf, & Diener-West, 2004). Although online grooming can be perpetrated from one adolescent to another (Ybarra & Mitchell, 2008), it is psychosocially more negative when perpetrated by an adult (Wolak et al., 2010). Moreover, the sexual relations of adolescents with adults are associated with significant physical health costs, such as pregnancy, sexually transmitted diseases, among others (Manlove, Terry, Humen, & Ikramullah, 2006; Wolak et al., 2010). Furthermore, suffering online grooming is related to worse mental health, such as anxiety, stress, depression, phobias, low self-esteem or suicide (Montiel, Carbonell, & Pereda, 2016). It should be taken into account that, for this reason, the age of sexual consent in Argentina - as in other Spanish-speaking countries, such as Spain - is from 16 years, so if an adult has sexual contact with an under 16 years old child is a criminal

offense. In that country, the article 131 of the Penal Code included such offense as a crime against sexual integrity. However, the age of sexual consent may vary from nation to nation according to legal jurisprudence.

Regarding the levels of online grooming, the prevalence of sexual solicitation in the last year was 5% -15% in adolescents aged 10 to 17 years in the United States and Europe (Bergen et al., 2014). Another study in the United States found similar figures with 9% of adolescents of the same age (Jones, Mitchell, & Finkelhor, 2012). Also, a study in the Netherlands with adolescents found that 6% of men suffered from it, while in women the figures rose to 19% (Baumgartner, Valkenburg, & Peter, 2010). Of the few existing studies in the Spanish language, an investigation in Spain found that 12% of adolescents under 16 years of age reported sexual solicitations by adults, while 7% reported sexual interactions with them (Gámez-Guadix et al., 2017). Regarding gender differences in this behavior, research indicates that women report suffering from it more frequently than men, while at an older age they suffer it to a greater extent (Mitchell, Wolak, & Finkelhor, 2008; Wolak et al., 2010).

Another negative online behavior by adolescents that recently attracted the attention of researchers and the community is sexting in Spanish (Quesada, Fernández-González, & Calvete, 2018). This consists of the creation and exchange of text messages, videos, images or photos with personal sexual content through the Internet, social networks or cell phones (Agustina & Gómez-Durán, 2012; Barrense-Dias, Berchtold, Surís, & Aire, 2018; Mitchell, Finkelhor, Jones, & Wolak, 2012; Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2016). Sexting is a risk factor for the psychosocial adjustment of the subjects, mainly in children or adolescents. Among these risk behaviors associated with this variable, we can mention sexual behaviors at an early age (Benotsch, Snipes, Martin, & Bull, 2012), and a greater probability of suffering from cyberbullying or online aggression (Crimmins & Seigfried-Spellar, 2014; Quesada et al., 2018; Reyns, Burek, Henson, & Fisher, 2013; Ricketts, Maloney, Marcum, & Higgins, 2015). In addition, another of the great psychosocial risks for adolescents is that many of those who suffer online grooming may also suffer other problems related to new technologies, such as sexting or cyberbullying (Wachs et al., 2017), although the interrelationships among these behaviors it has practically not been investigated in the world (Machimbarrena et al., 2018). One of the few investigations in this regard found that those who suffered online grooming were also more likely to suffer from sexting (Machimbarrena et al., 2018).

The solicitation and sexual interaction of adults with adolescents has become a concern in the media, educational and academic community. However, there are no studies in Argentina, as in other Latin American countries, that have evaluated such behavior in adolescents with instruments of solid psychometric properties to assess its levels and whether gender, age, emotional problems and sexting are predictors of it. Thus, the importance of the present work is that it is the first of its kind to examine a problem with vast psychosocial, physical and legal implications, but little studied in Argentina.

The specific objectives of this study are: a) to measure the incidence of online grooming and its variation according to gender and age in adolescents aged 12-16 years; and b) to determine if emotional problems (depression and anxiety), sexting, gender and age are predictors of grooming.

## Method

### *Participants*

An intentional sample of 727 adolescents from two private secondary schools in Paraná, Entre Ríos, Argentina, was constituted (aged 12 to 16 years,  $M_{\text{age}} = 15.01$  [ $SD = 1.7$ ]; 59% were women and 41% men). A 38% of the sample was in their first year, 34% in their second and the remaining percentage were in their third year of secondary school. 67% indicated that they lived

with both parents and 78% of the adolescents perceived themselves to be of a middle socioeconomic class. Although the age of sexual consent in Argentina is from 16 years old, it was decided to keep the 16-year-old adolescents because they were a lower percentage (82 cases). On the other hand, although they are legally at the age of consent, their psychosocial immaturity compared to that of an adult who contacts them for sexual purposes also places them at risk for worse mental health or other types of risks, such as sexual exploitation or pornography.

### **Instruments**

*Ad hoc sociodemographic questionnaire.* Gender, age, course attended, among others.

*The Questionnaire on Sexual Solicitations and Interactions of Minors with Adults* (QOSSIA, Gámez-Guadix et al., 2017). This 10-item questionnaire asks adolescents to indicate how often they experienced a sexual request or interaction with a subject 18 years of age or older in the past year, using a 4-point Likert scale: 0 (*never*), 1 (*once or twice*), 2 (*3-5 times*) and 3 (*6 or more times*). Inquiries about last year to avoid time bias due to longer periods and because that time period has been used in previous questionnaires on similar topics (for example, Jones et al.'s Internet Safety Survey for Youth, 2012), which favors comparisons with previous results. With respect to its psychometric properties, studies in samples of Spanish adolescents indicated an adequate factorial structure with two factors; one called sexual solicitations and the other, sexual interactions. The first was made up of the first five questions that refer to sexual requests or solicitation by an adult towards the adolescent (for example, sending a photo) and the other was made up of the rest, which inquire about intentions of an adult to sexually abuse of the adolescent (for example, I met an adult that I had met on the internet). This structure explained 60% of the variance and it was confirmed in a confirmatory factor analysis that indicated a good fit, with TLI = .98, CFI = .99 and RMSEA = .01. The adaptation to Argentina demonstrated good psychometric properties in adolescents, such as an adequate factorial structure similar to that of the authors, construct validity with respect to emotional problems, sexting and cybervictimization, and reliability above .93 for the scale (Resett, 2019).

*The Sexting Questionnaire* (Gámez-Guadix, Almendros, Borrajo, & Calvete, 2015). This instrument assesses the frequency in which adolescents sent sexual content online. To differentiate sexting behaviors from sending photos and information as a result of harassment (for instance, after receiving threats or insults), participants are asked to indicate how many times they have done the following things voluntarily, that is, because they want to: 1) "Send sexual information or text messages about you"; 2) "Send photos with sexual content (eg. nude) about yourself"; and 3) "Send images (for example, via webcam) or videos with sexual content about yourself." The answer options are: 0 = *never*; 1 = *1 to 3 times*; 2 = *4 to 10 times*; and 3 = *more than 10 times*. The prevalence is calculated considering, at least, those participants who mark the option 1 to 3 times or more. It is possible to derive a sexting index by adding or averaging the three questions. This scale has shown adequate construct validity with personality and adequate consistency in Spanish and Argentine samples (Gámez-Guadix et al., 2015; Gámez-Guadix, De Santisteban, & Resett, 2017). In the present sample, Cronbach's  $\alpha$  was .86.

*Rosenberg's Psychosomatic Symptom Scale* (RPS, Rosenberg, 1965). The 10 items of the RPS measure anxiety from the activation of the autonomic nervous system without including cognitive components (Rosenberg, 1965). It consists of ten questions about the frequency in which you experience nervousness, insomnia, nightmares, severe headaches, trembling or sweating of the hands, palpitations, breathing problems, even if you are not exercising, etc., which are scored 0 = *never* to 3 = *always*. An example of an item is: "I'm worried about my nerves." In Argentina, Cronbach's  $\alpha$  fluctuate from .74 to .78 (Facio, Resett, Mistrorigo, & Micocci, 2006). In this sample, Cronbach's  $\alpha$  was .84.

*Children's Depression Inventory* (CDI, Kovacs, 1992). The CDI is one of the most used inventories to measure depression in the world. It measures depressive syndrome -a state rather

than a trait level- in children and adolescents aged 7 to 17 years, through a series of symptoms such as disturbed mood, anhedonia, vegetative dysfunctions, self-evaluation and distorted interpersonal behaviors. It consists of 27 items of three alternatives each, which are scored from 0 to 2, in which the subject must choose the one that best suits how they have felt. An example of items is: "I feel sad all the time." In Argentina, Cronbach's  $\alpha$  fluctuate from .86 to .89 (Facio et al., 2006). In the present sample, Cronbach's  $\alpha$  was .83.

### ***Procedure***

The purpose of this research was explained to the school administrators and the student's parents. After obtaining the consent of the school and parents -the latter in writing-, the participants were informed of the purpose and voluntary participation, anonymity and confidentiality were guaranteed. The informed consent of the participants was also requested. The data was collected in the hours of classes that the schools allocated for this purpose and was carried out by the research team. The participants took about 30-40 minutes to complete the tests. The research was approved by the Universidad Católica Argentina.

### ***Statistic Analysis***

The data were analyzed with the Statistical Package for the Social Sciences (SPSS, IBM) version 23 program to obtain descriptive statistics (percentages, means, etc.) and inferential. With regard to the inferential statistics,  $X^2$  and student's  $t$  tests were carried out to check if gender introduced differences in grooming scores and ANOVAs to determine if age did.  $X^2$  was used to observe if gender introduced differences in each of the answers to the questions. Gender and age were placed as a factor between subjects and grooming scores as a dependent variable for Student's  $t$  and ANOVAs. Post hoc Games-Howell comparisons were carried out because the variances were heterogeneous  $ps = .001$ , as suggested (Howell, 2007). Hierarchical regressions were performed to observe whether age and gender (first block to control for these variables) and emotional problems and sexting (second block) predicted grooming behaviors. These variables were placed as predictors and grooming scores as dependent variables. The sample originally consisted of 752 cases, but 25 participants were eliminated from the present analysis as they were outliers, since with respect to requests or interactions they scored  $z = +3.29$  ( $p < .001$ ), as suggested by some authors (e.g., Tabachnick & Fidell, 2014). Regarding the distribution of the variables for anxiety, depression and sexting, asymmetry was found in relatively normal values that ranged from 0.07 to 2.50, with respect to kurtosis, these ranged from 0.88 to 5.20. Asymmetry values greater than 3 and kurtosis of 8 to 20 -or more- are extreme (Kline, 2015; Tabacknick & Fidell, 2014). In contrast, for applications the asymmetry and kurtosis values were 3.01 and 8.36, respectively, for interactions they were 4.32 and 12.60, respectively, and for grooming they were 3.32 and 12.30, respectively, therefore, they deviated from normality. In social sciences, such as psychology, it is not unusual for distributions that deviate from normal to be found, even more, in a variable such as online grooming. For this reason, it was decided to carry out logarithmic transformations because there was a positive skew to the left in order to achieve a distribution closer to normality (Howell, 2007). Although not all authors accept this procedure, they can be carried out for this purpose in order to accomplish a more precise statistical analyzes, mainly when some variables have a normal distribution, but others do not (Tabacknick & Fidell, 2014), as in this case. In addition, the sample was large and the comparisons of means, such as student's  $t$ , are quite robust in this sense (Sainani, 2012; Tabacknick & Fidell, 2014). After transformation, the distribution improved markedly for requests, interactions, and grooming, with skewness and kurtosis values of 1.99 and 5.02, 2.13 and 6.28, and 2.10 and 6.05, respectively. As the data had now drifted away from extreme values, it was decided to use parametric statistics.

## Results

Table 1 shows the response percentages for each of the questions according to gender and for the total number of adolescents who reported having suffered such behavior on at least one occasion. Descriptive statistics of total solicitation, interaction and grooming are also presented. As shown in the table, only gender differences emerged in questions 8 and 10 due to higher percentages of men, compared to women,  $X^2(1) = 9.86$   $p < .002$  and  $X^2(1) = 3.17$   $p < .05$ , respectively.

*Table 1*

Descriptive statistics regarding solicitation, interaction and total grooming in adolescents

| Items  | Males      | Females    | Total    |           |  |
|--|------------|------------|----------|-----------|--|
| 1. An adult asked me for pictures or videos of myself with sexual content                            | 8%         | 8%         | 8%       |           |  |
| 2. An adult asked me questions about explicit sexual content through the Internet or a mobile device | 9%         | 9%         | 9%       |           |  |
| 3. I have been asked to have cybersex with an adult (e.g., via a webcam)                             | 6%         | 4%         | 5%       |           |  |
| 4. An adult asked over the Internet me to have offline sex   | 6%         | 4%         | 5%       |           |  |
| 5. An adult sent me photos or videos of himself/ herself with sexual content                         | 12%        | 10%        | 11%      |           |  |
| 6. I have sent an adult photos or videos with sexual content of me                                   | 4%         | 3%         | 3%       |           |  |
| 7. I have maintained a flirtatious relationship with an adult online                                 | 6%         | 3%         | 4%       |           |  |
| 8. I talked about sexual things with an adult on the Internet  | 14%        | 4%         | 8%       |           |  |
| 9. I've met an adult I previously met on the Internet in person                                      | 7%         | 4%         | 5%       |           |  |
| 10. We have met offline to have sexual contact   | 5%         | 2%         | 3%       |           |  |
| <b>Dimension</b>   | <b>Min</b> | <b>Max</b> | <b>M</b> | <b>SD</b> |  |
| Solicitation   | 0          | 15         | 0.54     | 1.84      |  |
| Interaction  | 0          | 15         | 0.43     | 1.80      |  |
| Grooming   | 0          | 30         | 0.98     | 3.46      |  |
| <i>N = 727</i>   |            |            |          |           |  |

With respect to the total percentage, 17% of the adolescents reported having some kind of solicitation experience, 12% interaction and 20% grooming (both). There were no gender differences in these variables, with the only exception of interaction in which marginal differences emerged due to higher percentages of men compared to women 14% versus 10%  $X^2(1) = 2.94$   $p = .09$ .

Table 2 shows the means and standard deviations in solicitation, interaction and total grooming scores, according to gender.

Table 2

Descriptive statistics regarding solicitation, interaction and total grooming in adolescents according to gender

|              | Gender | <i>N</i> | <i>M</i> | <i>SD</i> |
|--------------|--------|----------|----------|-----------|
| Solicitation | male   | 282      | 0.68     | 2.33      |
|              | female | 445      | 0.47     | 1.48      |
| Interaction  | male   | 282      | 0.68     | 2.26      |
|              | female | 445      | 0.28     | 1.45      |
| Grooming     | male   | 282      | 1.36     | 4.44      |
|              | female | 445      | 0.75     | 2.70      |

When comparing the scores with Student's *t* for the three variables according to gender, the variances of both groups were homogeneous  $ps > .13$  and there were differences in interaction and marginal in grooming  $t(725) = 2.30$   $p < .05$  and  $t(725) = 1.62$   $p = .09$ , respectively, due to higher levels of the men who suffered from it, as presented in Table 2.

Table 3 shows the means and standard deviations in solicitation, interaction and grooming according to age group, grouping them into three equivalent age groups: 11-12, 13-14 and 15-16 years. When performing an ANOVA with age as a factor between subjects and grooming scores as dependent variables, significant differences emerged. When making post hoc comparisons, the differences were due to the fact that the 11-12 and 13-14 age group had lower levels of solicitation, interactions and grooming, compared to the 15-16 age group  $ps < .004, .05, .001, .05, .001$  and  $.04$ , respectively. A linear function was found between age and solicitation, interaction and grooming scores  $F = 10.59$   $p < .001$ ;  $F = 17.62$   $p < .001$  and  $F = 15.41$   $p < .001$ , respectively, as shown in Figure 1.

Table 3

Descriptive statistics regarding solicitation, interaction and total grooming in adolescents according to age group

|              |           | <i>N</i> | <i>M</i> | <i>SD</i> |             |
|--------------|-----------|----------|----------|-----------|-------------|
| Grooming     | Age 11-12 | 292      | .50      | 1.89      | F = 8.02*** |
|              | Age 13-14 | 223      | .90      | 3.42      |             |
|              | Age 15-16 | 212      | 1.73     | 4.80      |             |
|              | Total     | 727      | .98      | 3.46      |             |
| Solicitation | Age 11-12 | 292      | .34      | 1.35      | F = 5.84**  |
|              | Age 13-14 | 223      | .47      | 1.64      |             |
|              | Age 15-16 | 212      | .90      | 2.48      |             |
|              | Total     | 727      | .54      | 1.84      |             |
| Interaction  | Age 11-12 | 292      | .15      | .67       | F = 8.90*** |
|              | Age 13-14 | 223      | .43      | 1.92      |             |
|              | Age 15-16 | 212      | .83      | 2.53      |             |
|              | Total     | 727      | .43      | 1.80      |             |

Note. \*\*\* $p < .001$ ; \*\* $p < .003$

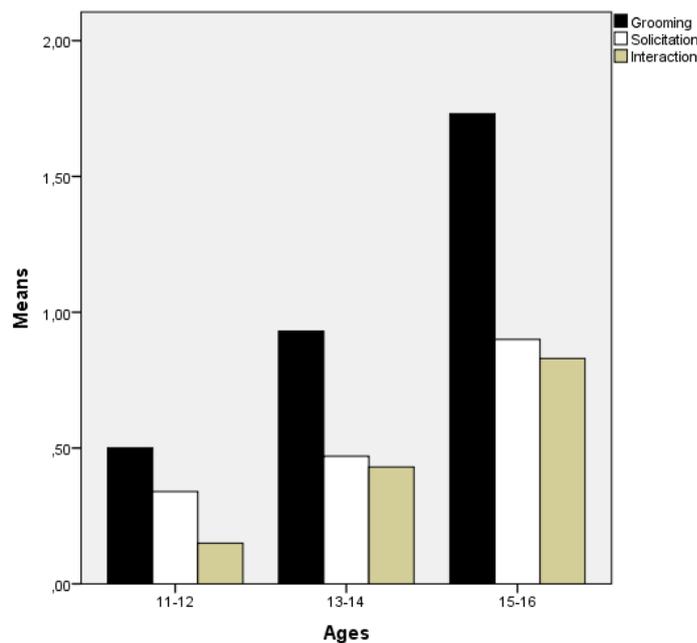


Figure 1. Means in solicitation, interaction and total grooming in adolescents according to age.

A series of hierarchical regressions were carried out with ages (12 years to 16 years) and gender (0 = female and 1 = male) in the first block, and scores in depression, anxiety and sexting in the second in order to predict solicitation, interaction and grooming scores. The results are presented in Table 4. For both solicitation, interaction and grooming, both blocks were significant  $ps < .005$ . As seen in said table, a 19% variance was predicted in solicitation, 22% in interaction, and 23% in grooming, with the significant predictors being age, depression, and sexting. The first block predicted 5%, 4% and 6%, thus generating a significant increase in the prediction. Gender was marginally significant for solicitation. As shown in Table 4, the older the age, the higher the grooming levels, the higher the depression scores, the higher the grooming levels and; the higher the sexting, the higher the scores for said behavior. Marginally, being male predicted a higher level of solicitation.

Table 4

*Results of hierarchical regressions to predict solicitation, interaction and grooming in adolescents*

|                             | Gender         | Age              | Depression       | Anxiety        | Sexting          |
|-----------------------------|----------------|------------------|------------------|----------------|------------------|
| Solicitation                | $\beta = .21$  | $\beta = .12$    | $\beta = .88$    | $\beta = .18$  | $\beta = .34$    |
| $R^2 = 19\%$                | $t = 1.65^*$   | $t = 2.39^{**}$  | $t = 3.99^{***}$ | $t = 1.18$     | $t = 6.92^{***}$ |
| Confidence intervals at 95% | -.70/.05       | .01/.22          | .02/.11          | -.01/.03       | .36/.66          |
| Interaction                 | $\beta = -.01$ | $\beta = .15$    | $\beta = .66$    | $\beta = -.02$ | $\beta = .38$    |
| $R^2 = 22\%$                | $t = -.01$     | $t = 3.20^{***}$ | $t = 3.08^{***}$ | $t = -.13$     | $t = 8.06^{***}$ |
| Confidence intervals at 95% | -.82/-.10      | .06/.25          | .01/.08          | -.02/.03       | .44/.72          |
| Grooming                    | $\beta = .10$  | $\beta = .14$    | $\beta = .81$    | $\beta = .08$  | $\beta = .38$    |
| $R^2 = 23\%$                | $t = .88$      | $t = 2.98^{***}$ | $t = 3.79^{***}$ | $t = .58$      | $t = 7.98^{***}$ |
| Confidence intervals at 95% | -1.48/-.10     | .08/.45          | .02/.19          | -.03/.05       | .82/1.36         |

Note.  $***p < .001$   $**p < .01$   $*p = .09$

## Discussion

The importance of this work was to examine the level of online grooming, with its aspects of solicitations and interactions, in a sample of Argentine adolescents and to determine if gender, age, emotional problems -depression and anxiety- and sexting were predictors of the same. For this purpose, an intentional sample of 727 adolescents between 12 and 16 years of age (59% female and 41% male) who attended from the first year to the third year of two private secondary schools in the city of Paraná, Argentina, was constituted. Participants answered an online grooming questionnaire, measures of emotional problems, and a sexting questionnaire.

It was detected that 17% of adolescents reported solicitations, 12%, interactions and 20%, cases of online grooming at least once in the last year. These percentages were higher than the 13% and 8% sexual solicitation and interaction found with the same instrument in Spanish samples by the author of the test (Gómez-Guadix et al., 2017). They were also higher than the 5% -15% found in adolescents aged 10 to 17 years in the United States and Europe (Bergen et al., 2014). However, the data detected here are of great concern because the percentages were higher than those detected in other international studies. Moreover, the levels can be much higher, since many adolescents may not have confessed to online grooming to give socially desirable responses, out of fear or shame, among other reasons (Gómez-Guadix, 2017). For example, many adolescents may not have indicated it in the questionnaire for fear of being reprimanded or –even- because the same adults with whom they had contact threatened them or told them that it was a “secret” between them, which is one of their persuasion strategies (De Santisteban & Gómez-Guadix, 2017; Gómez-Guadix, Almendros, Calvete, & De Santisteban, 2018). In the same way, it must be taken into account that adults may also have lied at their age - for example, saying that they were minors - and, thus, many more participants may have suffered it without realizing it.

Various cultural, social and economic factors could explain the differences found between the grooming percentages reported here and those of the author of the test in Spain. For example, Argentina is a country in which adolescents have a great fascination for new technologies, such as cell phones, and - at the level of Latin America - they are among those who most use these technologies; for this reason, they have been called the interactive generation (Facio & Resett, 2012; Fundación Telefónica, 2008). For many Argentine adolescents, it is even their parents who bought their first cell phone when they were children. For example, in Argentina children already have a cell phone before they are 9 years old and it is the country in the region where this fact occurs earlier, as suggested by a recent study by the United Nations Children's Fund (UNICEF, 2020). Additionally, that study indicated that adolescents reported that their parents and teachers did little to protect them from the dangers of the Internet. It is possible that, in this way, also cultural differences in parental education explain these results. However, as this is an intentional sample, the findings should be viewed with caution.

With regard to gender differences, mean differences were found in interaction and marginal in grooming due to the fact that more men suffered it - the same was detected when comparing the percentages of interactions, since 14% of men suffered it versus 10% of women-. Although gender differences in some studies indicate that women suffer it to a greater extent (Mitchell et al., 2008; Wolak et al., 2010), research with this instrument in Spain also detected that it was men who suffered it to a greater extent. A possible explanation of these differences –as in the question “We have met offline to have sexual contact”, which is one of those that measures interactions- may be due to the fact that they are more uninhibited and have less fear of being sexually assaulted compared with the women.

The issue of gender differences should be examined in greater detail, but it is possible that the inconsistency in the findings may be due to the different samples and operationalizations of the construct, mainly in an issue such as online grooming where research is still incipient. Besides, it is also possible that women report it to a lesser extent due to greater social desirability or fear of

being socially disapproved, mainly in a Latin nation like Argentina in which double standards regarding sexuality are very present, with many authors indicating that this happens frequently in more traditional societies (Ybarra & Mitchell, 2014). In the same way, it is established that adolescent women present greater social desirability compared to men (Facio et al., 2006).

With respect to age, a linear function was detected between age and solicitation, interaction and grooming due to the fact that older age, greater suffering from these behaviors, with adolescents aged 15-16 years reporting the highest levels. These studies are consistent with those of other international studies that found that, the older the age, the higher the grooming level (Gámez-Guadix et al., 2017). It is proven that pedophiles seek minor victims, but older than school-age children because they make greater use of ICTs for communication purposes and with less adult supervision, compared to children (Gamez-Guadix, 2017). That the age of adolescents is linearly associated with grooming may be due to the fact that their use of ICTs increases linearly with age. For example, in Europe 38% of children aged 9-12 were users of social networks versus 77% of those aged 13-16 (Livingstone, Olafsson, & Staksrud, 2011). On the other hand, aggressors also often prefer victims who have undergone pubertal changes because the adolescent body already has adult proportions. Similarly, the social and pubertal changes that adolescents experience as they enter this stage lead adolescents to show greater interest and sexual contact (Steinberg, 2010). Also, the increase with age may be due to the fact that adolescents -as they enter this important stage of life- not only increase the use of ICT for communication and social exchange purposes (Gámez-Guadix, 2017), but also to explore their sexuality and identity (Arnett, 2014). It is known that the use of ICT can be a frequent way for adolescents to explore their sexuality as they develop, as it has been pointed out by some authors (Cooper, Quayle, Jonsson, & Svedin, 2016; Döring, 2014; Walker, Sancí, & Temple-Smith, 2013).

Regarding the prediction of said behavior, a large explained variance was found - according to the effect sizes of Cohen (1992) - with 19%, 22% and 23%, for request, interaction and grooming, respectively, from the gender, age and emotional problems and sexting. Again, being male and older age were significantly associated with suffering such behavior, although for the former the significance was marginal. No associations were found between such behavior and anxiety, but there were for depression; which would indicate that adolescents with depressive symptoms - a negative image of themselves, for example - would be more vulnerable subjects to online grooming, as some research has detected (for example, Montiel et al., 2016; Ybarra et al., 2004). Future studies should examine whether anxiety - excessive fear or worry - is a risk factor for grooming or not. For example, perhaps high levels of anxiety - with its component of excessive worry - are associated with not talking to strangers on the Internet. What is important about these findings is that depressive symptomatology was a significant predictor after controlling for gender, since it has been proven that men and women differ with respect to depressive symptomatology (Facio et al., 2006; Steinberg, 2010).

The high association between grooming and sexting is not striking -it was the best predictor along with age-, since sharing personal sexual content could be a risk factor for adults contacting minors for sexual purposes. Recent studies (Machimbarrena et al., 2018; Reyns et al., 2013) have also detected this association, as well as the relation between online grooming and cybervictimization -another form of victimization, but at the hands of peers-. It is established that adults who carry out grooming seek information on the vulnerability of potential victims before initiating the abuse (Gámez-Guadix et al., 2018), for example, by studying the content that adolescents expose in their social networks. In this way, sharing intimate content, such as photos, videos or depressive symptoms - extreme sadness, being unhappy with oneself, among other indicators - can be a precedent of grooming. Although it is possible that such behaviors are also a consequence of grooming, that is, inappropriate sexual contact with an adult could make minors more sexually uninhibited - as occurs with physical sexual abuse - and increase their sexting behaviors (Paolucci, Genuis, & Violato, 2001). Future studies should examine the temporal

relationships between these behaviors in order to examine over time the stability of the phenomenon and the directionality of the variables, which is not possible in a type of cross-sectional study. Recent longitudinal Spanish studies demonstrated bidirectional relationships between online grooming and sexting (Gámez-Guadix & Mateo-Pérez, 2019), although more research is needed in order to detect what the mechanism is like between these variables. It would be necessary for future research to investigate how the directionality of the variables looks more precisely and in a nation with high use of ICT in adolescents. Likewise, there could be bidirectionality between the variables, but in this case, is there a more significant directionality? Or in other words and using -for example- structural equations, which of the paths is more significant? That is, is sexting an antecedent or a consequence of online grooming? This type of study is crucial for prevention activities.

The present work has a series of limitations that must be highlighted. In the first place, a selection of the intentional sample of Paraná, Entre Ríos, Argentina; the use of the self-report to measure online grooming –which has known limitations, mainly in a variable in which the lack of honesty or social desirability has a great impact- and with a sample of a smaller size than that used in Spain by the authors of the test. Also, having evaluated all the variables with the self-report artificially increases the correlations between the variables due to the variance shared by the data collection method. Likewise, sexting was only measured with a scale of three questions. Finally, the type of cross-sectional study does not allow determining the directionality of causality.

Future studies should examine this problem in larger and randomly selected samples from Argentina, in order to be able to generalize the results. In the same way, it would be interesting to carry out studies in other countries of the region to compare the results and determine whether Argentina has the highest levels in the region or not. It would also be interesting to include other ages, such as school-age children, to know if at an early age - such as 10 or 11 years - there are already victims of grooming, for example, it has been studied that in Argentina children of 9 years old already have cellphones. Future research should be longitudinal to determine the temporal stability of online grooming, requests and interactions, such as evaluating the interrelationships between such behavior and sexting, for example, is grooming an antecedent or a consequence of sexting? Likewise, such behavior should be examined with other data collection techniques, such as peer nominations to avoid the limitations of self-report, mainly in the face of negative behaviors such as sexting or grooming. Equally, future research should examine the relationships between the variables with structural models. It would be desirable to evaluate the influence of other relevant variables, such as early sexuality, problematic use of new technologies, phubbing, personality traits, impulsivity, such as interpersonal factors - peer group pressure, family problems, etc.-, among others. It would also be interesting to see which parental dimensions are associated with having adolescent children who suffer from such behavior - parenting styles, parental control, lack of parental supervision of ICT, among others - or if the problematic use of ICT by parents - excessive use by them, for example - are related to the grooming suffered. It would be interesting to see how the dimensions of parenting would lead to grooming, that is, is there a direct effect or is it an indirect effect through the inappropriate use of new technologies? Mainly, observing that the grooming levels detected here are higher than those found in Spain. Finally, progress should be made in preventing the problem. These results would indicate that factors such as depressive symptoms, older age, and sharing intimate sexual content may be associated with grooming. Therefore, these behaviors must be observed with care by parents, teachers and adults. Not with a message to prohibit the use of ICT by adolescents, which would be unrealistic (Gámez-Guadix, 2017), but with the idea of their safe use and taking precautions. Progress should also be made in the development of online programs or games - of great attraction to adolescents - that raise awareness about the use of ICT insurance and the risks of misuse of these, such as grooming and sexting.

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