

# A DYADIC APPROACH TO ADOLESCENTS' RISKY ONLINE BEHAVIORS

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## ABSTRACT

This research analyzes the discrepancies respecting parents' and their children's perspectives on adolescents' risky online behaviors and parental mediation. Rather than focus solely on youth outcomes, this study explores dyadic data, by comparing reports from adolescents attending 7<sup>th</sup> to 12<sup>th</sup> grades in Portuguese schools and those of their parents (N=1016). Moreover, this research considers the existence of defense mechanisms influencing adolescents' reports, a factor that has been neglected in previous studies. Differences regarding adolescents' gender, parents' gender, and adolescents' school year are considered and tested using One-way ANOVA. Within the family unit, the only members considered by adolescents to have the same or more online and computer skills than the teenagers themselves are their older siblings. Practical implications aiming to mitigate the risk involved in adolescents' online experiences, and theoretical contributions to the field of prevention and youth well-being in the context of consumer behavior in the digital age are discussed.

**Keywords:** Online Risk Behavior, Online Consumption Behavior, Youth Well-Being, Parental Mediation, Online Prevention, Dyadic Approach.

**JEL Classification:** I31, M39

## 1. INTRODUCTION

Despite the advantages of the Internet, one of the challenges regarding adolescents' experiences in online environments is the level of risk taken in online activities (Walrave et al., 2016), which some authors stress to have a potential negative impact on safety, school, relationships, and well-being (Echeburua & de Corral, 2010; Vangeel et al., 2016). Subsequently, recent studies acknowledge that parental awareness about adolescents' online risky behaviors is still under-researched (Byrne et al., 2014; Symons et al., 2017), especially with respect to dyadic approaches including both perspectives of adolescents and parents. This line of research has been advocated as crucial in the development of strategies to mitigate adolescents' potentially harmful online risks, whether content, contact, commercial, or privacy-related (Livingstone & Haddon, 2008). Ultimately, the underlined rationale of dyadic studies on this topic is that parental knowledge is a protective factor in terms of adolescent adaptation and fundamental for adjusting parenting strategies and public campaigns (e.g. social marketing) to the needs of adolescents (Symons et al., 2017). Indeed, current research stresses the crucial role of parenting in helping to foster optimal adjustment and behavior during the period of adolescent within a challenging and fast-changing context (Maholmes, 2018).

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The Internet has become a dominant part of adolescents' lives, where online and mobile applications multiply opportunities to create, share and consume content, as well as to contact others (Walrave et al., 2016). Social network sites (SNSs) have gained special preference among youngsters as a way of exploring online new forms of communication, consumption and possibilities to express their identity (Marwick & boyd, 2014). Indeed, these platforms accommodate specific needs inherent to adolescents' development, who desire to be more autonomous from their parents and receive feedback from their peers (Buhrmester & Prager, 1995). Notably, around 93% of teenagers possess an account on a social networking site (Walrave et al., 2016). Since SNSs encourage the dissemination of individuals' personal information (Robinson, 2016), research has pointed out that online self-disclosure, in comparison to offline environments, occurs to a greater extent (Barak & Bloch 2006; McCoyd & Kerson, 2006). Moreover, previous research revealed that teenagers have higher levels of disclosure when they feel less inhibited in using media such as instant messaging (IM) (Schouten et al., 2007), which is closely connected to SNSs. Comparing to adults, research suggests that youngsters disclose more information and tend to use fewer privacy settings on SNSs, though engaging in more online potential risks (Christofides et al., 2011). In social media, disclosure can be related both to the process of providing personal details on the profile page, and the process of publicly communicating thoughts, feelings, and activities, which can range from non-intimate to more intimate nature (Krasnova & Veltri, 2012; Lin & Utz, 2017). Additionally, the traditional concept of friendship has been changing in the social media environment and shaped by the notion of anonymity (Maholmes, 2018).

In a European context, by 2018 the share of EU-28 households with Internet access had risen to 89%, which is a 29 percentage points increase over a ten-year period (Eurostat, 2019). In Portugal, in 2019, 80.9% of the Portuguese families had access to the Internet. However, access to the Internet at home increases to 94.5% in households with families with children up to 15 years old (Portugal Statistics – INE, 2019). In 2019, Facebook continued to be the SNS most used in Portugal, where 95.3% of SNSs users had a Facebook account (Marktest, 2019). Moreover, in Europe, after Sweden and Finland, Portugal has the highest number of mobile subscriptions per 1000 inhabitants, and is the EU country having the highest increase since 1989 (Pordata, 2018). Notably, Pontes et al. (2014) found that 13% of a Portuguese sample of teenager students had a high incidence of Internet addiction. This phenomenon had been anticipated by Livingstone and Haddon (2009). The researchers recommended further research and the development of strategies for minimizing children's online risks in countries such as Portugal, since this was considered one of the European countries having a more recent rapid adoption of the Internet and where access seemed to exceed skills and cultural adjustment. These facts emphasize the need to develop further research using a dyadic perspective about adolescents' online activities and risky behaviors.

The present research contributes to the understanding of discrepancies existing between parents and their children's reports regarding adolescents' online risks and parental mediation strategies. This research uses dyadic data that allow performing a reliable comparison between the perspectives of parents and their children, in the Portuguese context. Moreover, the present study considers the effect of defense mechanisms in the adolescents' reports, particularly the projection mechanism, by attributing actions to others, such as their "friends" (Cramer, 1987; Vaillant, 1992). Notably, this factor has been absent from previous research. Ultimately, this research presents practical implications seeking to minimize adolescents' online risks and makes a theoretical contribution to the field of prevention and youth well-being in the context of consumer behavior in the digital age.

## 2. LITERATURE REVIEW

### 2.1 Adolescents' Online Risky Behaviors: Parents' Perspective

While alternative subcategories are suggested in literature, Livingstone and Haddon (2008: 6) identify four different categories of online risks that children and teenagers can experience when using the Internet: content risks (e.g. exposure to sexual and violent content), contact risks (contact with strangers and cyberbullying), commercial risks (e.g. gambling), and privacy risks (e.g. giving out personal information and invasion of privacy). Although research suggests that adolescents are aware of how to preserve online privacy, adolescents do not always engage in safe-protection practices (Walrave & Heirman, 2011; Robinson, 2016). One reason for parents' misconceptions about adolescents' online actions may reside in what different groups perceive as private information, since what is private information to adults does not necessarily carry the same meaning for adolescents (Christofides et al., 2011). Moreover, adults perceive information interactions in a more complex fashion than younger people do (Robinson, 2016). This process may result in different perspectives regarding the most important strategies for maintaining safety in an online environment.

Against this context, studies analyzing adolescents' risky online behaviors (by focusing on both parents and their children's reports) have been highlighting discrepancies showing that parents still have little knowledge about adolescents' potentially harmful online behaviors. Of nine published studies that were identified as following this line of research (Table 1), three were performed in the US (Cho & Cheon, 2005; Cottrell et al., 2007; Byrne et al., 2014), one in the UK (Livingstone & Bober, 2004), Netherlands (Dehue et al., 2008), Sweden (Sorbring, 2014), Singapore (Liau et al., 2008), and Belgium (Symons et al., 2017), respectively, and one was developed in 25 countries of the EU Kids Online Network (Livingstone et al., 2011). Of those studies, six used paired-samples, which allow comparing children's reports directly with those of their parents (Cho & Cheon, 2005; Cottrell et al., 2007; Livingstone et al., 2011; Byrne et al., 2014; Sorbring, 2014; Symons et al., 2017). Symons et al. (2017) use triadic data by comparing reports from mother, father, and children belonging to the same family unit. The remaining studies use independent-samples (parents and adolescents) for the analysis.

**Table 1. Dyadic studies on adolescents' online risks**

Authors	Sample	Research Aim
Livingstone & Bober (2004)	Country: UK Instrument: Face-to-face survey Samples: Independent Parents (N=906) Children and adolescents aged 9-19 years old (N= 1511)	To study the use of the Internet with an evaluation of online risks.
Cho & Cheon (2005)	Country: US Instrument: Self-administered questionnaire Samples: Paired Parents (N=178) Children and adolescents aged 11-16 years old (N=178)	To explore children's exposure to negative online content by building a theoretical model that examines the effect of family context factors on children's contact with negative Internet-based content.
Cottrell et al. (2007)	Country: US Instrument: Self-administered questionnaire Samples: Paired Parents (N=518) Children and adolescents aged 12-17 years old (N=518)	To analyze models predicting adolescents' involvement in online behaviors of which their parents would disapprove. To examine the factors associated with adolescents' future intentions to engage in these behaviors.

Dehue et al. (2008)	Country: Netherlands Instrument: Self-administered questionnaire Samples: Independent Parents (N=831) Children and adolescents from primary and secondary schools (N= 1211)	To study the prevalence and nature of cyberbullying of and by youngsters and the related parental perceptions.
Liau et al. (2008)	Country: Singapore Instrument: Survey online (students) self-administered questionnaire (parents) Samples: A paired sample was generated from larger independent samples Parents (N=169) Children and adolescents aged 12-16 years old (N=169)	To analyze the parental awareness and monitoring of adolescent Internet use.
Livingstone et al. (2011)	Country: 25 countries (EU Kids Online network) Instrument: Survey administration at home, face-to-face, with a self-completion section for sensitive questions Samples: Paired Parents (N= 25142) Children and adolescents aged 9-16 years old (N=25142)	To empirically examine European children's and parents' experiences, as well as practices regarding risky and safer use of the online environment.
Byrne et al. (2014)	Country: US Instrument: survey Sample: Paired Parents (N=456) Children and adolescents aged years old (N=456)	To analyze variables within the family context that can be used to predict parental underestimation of if their child has engaged in risky online experiences.
Sorbring (2014)	Country: Sweden Instrument: Self-administered questionnaire Sample: Paired Parents (N=798) Children and adolescents aged 13-15 years old (N= 798)	To analyze parents' worries and concerns regarding their children's use of the Internet. To explore existing connections between parents' concerns and different parental and child profile and Internet use.
Symmons et al. (2017)	Country: Belgium Instrument: Self-administered questionnaire Sample: Paired (triadic data) Parents (N=357) Children and adolescents aged 13-18 years old (N= 357)	To analyze parental knowledge about adolescents' online activities and experiences with online risks.

Source: Own Elaboration

Studies comparing reports from both parents' and adolescents' perspectives on online content risks have mostly assessed age-inappropriate content regarding violent or sexually related materials (Symmons et al., 2017). However, in their study on "how adolescents negotiate context in social media", Marwick and boyd (2014) advocate that, while the act of sharing content (such as photos) is central to participation in social media networks, shared photos can reveal much about on user's personal and social environment. In particular, Varderhoven et al. (2014) found that while Flemish adolescents shared significantly fewer pictures showing risky behaviors to "friends-of-friends" than "friends" on Facebook, 23% were tagged in photos showing themselves partying, 16% in swim or underwear, and 13% in situations of alcohol use. Literature stresses that teenagers use photos as a form of expressing their identity and sharing the self with their peers, which sometimes results in tagging and being tagged by others in inappropriate photos. Subsequently, this process can be experienced as a violation of privacy (Marwick & Boyd, 2014). Moreover, Peluchette and Karl (2008) found that a considerable percentage of adolescents with an SNS-active profile would not want their prospective employers to see published posts in which they were depicted. Despite the existing processes of self-norms regulation between peers (Livingstone, 2008; Marwick & Boyd, 2014), the process of posting pictures plays an essential part in SNSs. For example, Huang et al. (2014) concluded that contact with friends' online photos depicting situations of partying or drinking was significantly related to both smoking and alcohol use.

Concerning contact risks, cyberbullying has been a central concern related to deviant behavior in an online environment, which parents may not be fully aware of (Livingstone & Bober, 2004; Cho & Cheon, 2005; Dehue et al., 2008; Byrne et al., 2014). This phenomenon is related to continuous hostile behavior via information technology, such as email, IM, SMS, and SNSs, with the intention of attacking or embarrassing a peer (Kiriakidis & Kavoura, 2010; Law et al., 2010; Byrne et al., 2014). This risky online behavior reaches its peak during adolescence and can be approached in the perspective of cyber aggression and cyber victimization, meaning that the individual can be the perpetrator, the victim, or engage in both behaviors (Slonje et al., 2013). A study developed in Belgium showed direct relations between victimization and perpetration (Pabian & Vandebosch, 2016). Moreover, studies comparing parents' and children's reports have also assessed contact risks through adolescents' interactions with strangers by adding people they do not know to their online network (Liau et al., 2008; Byrne et al., 2014; Symons et al., 2017).

Furthermore, the presence of gambling on the Internet and on diverse forms of digital media, in addition to adolescents' proficiency in using and accessing these media, have increased the level of younger people's exposure to remote gambling opportunities (Griffiths & Parke, 2010; King et al., 2010; Daria & Griffiths, 2012). Moreover, social networking environments can encourage adolescents into gambling, especially as the initiation may not involve real funds (Floros et al., 2013). Nonetheless, despite the existence of social networking, demo and free-play modes of gambling, there are studies reporting adolescents engaging with online paid gambling by using third-party credit cards (Griffiths, 2011). Although this risky behavior has often been reported, this area has been relatively under-researched, especially by including both perspectives of adolescents and parents in different countries (Livingstone & Haddon, 2008, 2009; Floros et al., 2013; Byrne et al., 2014). Floros et al. (2013) found that there are specific online risky activities associated with an increase in adolescents engaging in online gambling, such as watching pornographic materials. The researchers concluded that even though parents report engaging in Internet security measures, their safety practices had no significant impact on their children engaging in Internet gambling. However, parents' care correlates with lower levels of engagement with gambling, while overprotection correlates with higher levels of involvement with this activity. Additionally, literature shows that adolescent gambling has been associated to a greater extent with boys and that this activity can disrupt children's social and psychological development (Cho & Cheon, 2005; Floros et al., 2013). Hitherto, little is known about parents' awareness of their children's engagement with online gambling activities.

## **2.2 Reasons for Discrepancies on Parents' Knowledge on Adolescent's Online Behavior**

While the existing dyadic studies show discrepancies when comparing parents' and their children's reports on adolescents' online risky behaviors and parental mediation (e.g. Liau et al., 2008; Symons et al., 2017), these discrepancies can be related to defense mechanisms, types of parental mediation, age, and gender, as well as to online and computer skills ascribed to family members.

### *2.2.1 Defense mechanisms*

Defense mechanisms have been absent from previous empirical dyadic studies, despite being a phenomenon extensively explored in Psychology. In fact, this is an important aspect of children and adolescents' personality, and it is currently seen as a component of normal psychological functioning. Research advocates that the use of defense mechanisms changes over the different stages of development (Cramer, 1987; Vaillant, 1992). Three mechanisms of

defense have been proposed in the Psychology literature: denial, projection, and identification. Denial relates to the process of “ignoring or misrepresenting thoughts or experiences that would be upsetting if accurately perceived”. Projection eliminates “disturbing feelings or thoughts” by ascribing them to others. The identification defense mechanism relates to a process of “change in the self to become more like a person or group” admired (Cramer, 2007: 2). Noteworthy, especially the use of projection mechanisms increases from early childhood to the period of late childhood (age 8) and adolescence (age 16), when it predominates. The use of defense mechanisms related to projection and identification are more common between the late childhood period and age 18 (Piaget, 1952). Moreover, a third-person effect has been identified and introduced in literature by Davison (1983). This effect posits that people tend to believe that they are less influenced by media compared to others, based on personal bias. This hypothesis has been extended to the Internet, denominated as “Web third-person effect”, suggesting that the expectation of the impact that web media have on others impacts one’s attitudes and actions (Antonopoulos et al., 2015).

While these features have been largely absent from previous dyadic studies on adolescents’ online risky behaviors, Livingstone et al. (2011: 25) considered the “third person effect” in their EU study. The authors found that children were around “four times more likely” to express that there were things on the Internet that would bother other children than things that have bothered them personally. This result shows the relevance in asking adolescents what they believe their peers’ behavior is, given that there may be a projection of negative effects onto others (Fields & Schuman, 1976).

### *2.2.2 Age and gender*

The perspective of parents respecting the occurrence of specific adolescents’ online risks can differ according to the adolescents’ gender, parents’ gender, and adolescents’ age. For example, parents tend to underestimate problems experienced by older teenagers (Livingstone et al., 2011). In addition, significant differences were found for perceived content risks by parents (watching sexual and violent material online) considering the child’s gender. Specifically, parents were more likely to know that their sons had watched online sexually-related materials than their daughters (Symons et al., 2017). Also, some studies have found that boys were more likely to experience content risks, while girls were more at risk for cyberbullying victimization (Beckman et al., 2013; Vandenbosch & Peter, 2016; Symons et al., 2017). Regarding parents’ perceptions, Symons et al. (2017) found that parents’ perspectives on adolescents’ engagement in online risks were associated with gender, especially among fathers. Nevertheless, other studies reveal that a clear gender difference does not exist (Tokunaga, 2010).

### *2.2.3 Parental mediation: parents v. children*

Parents have a vital role in mediating the relationship between youngsters and the new media (Livingstone & Helsper, 2008). Literature posits that parental mediation can be predominantly active or restrictive (Miyazaki et al., 2009). While active mediation relates to the process of discussing risks related to the use of the Internet and parental advising on how to avoid risks and maintain protection, restrictive mediation refers to practices that regulate or track children’s Internet use (Ang, 2015). Symons et al. (2017) suggest that active mediation is more related to open parent-child communication as compared to a restrictive mediation, which has more in common to parental monitoring. Although some authors propose diverse subdivisions, Livingstone et al. (2011) distinguish between active mediation (e.g. open discussion concerning Internet use), restrictive mediation (setting rules

by limiting specific activities), monitoring (tracking records of the child's Internet use), and technical mediation (e.g. using filter software).

With regard to Internet safety communication, Cerna et al. (2015) advocate that active mediation increases the probability that the child discloses cyberbullying victimization issues, while restrictive mediation has no such effect, or is weakly related to youths' involvement in these cyberbullying risky behaviors (Elsaesser et al., 2017). Similarly, Byrne et al. (2014) found that if children consider the communication with their parents on online risks to be difficult, it is less likely that parents acknowledge worrying online approaches to teenagers by strangers. While more studies have highlighted active mediation strategies to be more effective as a protection from online risks, research has also stressed the protective factor of restrictive practices (e.g. Livingstone & Helsper, 2008; Lee, 2012). Cottrell et al. (2007) consider that Internet monitoring strategies, such as placing the computer in an open area, establishing time limits on the computer, using blocking software, and reviewing Internet site history can be seen as active methods of parental monitoring. However, these strategies were only associated with adolescents' behaviors when children acknowledged that their parents use these methods. Furthermore, Cottrell et al. (2007) point out that it is vital that children understand the rules for these to have an impact on their online behavior. Notwithstanding, literature notes that parents seem to overestimate the amount of parental supervision and communications regarding Internet safety that takes place at home (Liau et al., 2008; Symons et al., 2017).

#### *2.2.4 Knowledge attributed to parents and older siblings*

Some studies reveal that a skill-related gap between parents and their children exists and that adolescents usually consider themselves to be more knowledgeable regarding online and computer activities (Livingstone & Bober, 2004), especially older adolescents (Livingstone et al., 2011). Furthermore, the knowledge that adolescents attribute to their older siblings has been absent from literature, in spite the fact that siblings have the potential to exert a positive influence, whether related to monitoring or modeling, on younger children's online activities (Cottrell et al., 2007). Indeed, one important feature of families, which can impact the environment in which adolescents are raised, is the existence of siblings (Maholmes, 2018; Pearce et al., 2018). Accordingly, parents may select different strategies when many children live in a household. Additionally, educational and social marketing campaigns may address older adolescents to involve this group in assisting parents in the well-being of the youngsters, aiming to mitigate potentially harmful online behaviors and promote safe online consumption.

### **3. METHOD**

To achieve the aforementioned goals, the present study relies on dyadic data extracted from reports of adolescents attending 7<sup>th</sup> to 12<sup>th</sup> grades, as well as of their parents (father or mother). This method allows for a more reliable comparison between parents' and their children's perspectives.

#### **3.1 Procedure**

A self-administered questionnaire was presented to both parents and their adolescent children (dyadic data) in four schools in the Central region of Portugal. Considering that the collection of multi-actor data is generally related to a high rate of non-response, this study uses a non-probabilistic sampling approach (Symons et al., 2017). Families were recruited with the assistance of the directors of classes from 7<sup>th</sup> to 12<sup>th</sup> grades (2011). Regarding

adolescents, the questionnaires were responded to in the classrooms in the presence of a teacher. The data collection was preceded by a written statement, and a consent form was signed by parents. For parents, the questionnaires were sent by mail, including the instructions, a stamp and a separate envelope which could be sealed and sent back by mail. By means of including a code on the back of all the questionnaires, the surveys were linked by household. The study protocol was approved by the ethics committee of the University of Porto. The adolescents' response rate was 97.4% and their parents' was 71.2%. There were 1016 paired-sample questionnaires validated.

### 3.2 Instrument

This study uses a self-administered survey approach, which was subjected to a pre-test. Questionnaires addressed to parents and adolescents included four groups of questions to assess respondents' perspectives of a) adolescents' online risky behaviors, b) the mediation strategies set by parents regarding their children's online activities, c) prevention actions that are believed to be more important regarding the maintenance of safety in an online environment, and d) adolescents' use of smartphones, SNSs, and sociodemographic information. Adolescents' questionnaires included also questions related to the knowledge that they attributed to their parents and older siblings regarding computer and online skills, the level of sharing their online activities with parents, as well as their perception regarding the risky behaviors in which their "friends" engaged in the past. Parents were additionally asked about the extent to which they believe to be aware of their children's online activities and the knowledge that they ascribe to their child (respondent to the questionnaire) regarding computer and online skills.

### 3.3 Measures

For measuring *online risks*, this study considered contact and content risks as distinguished by Livingstone and Haddon (2008), and empirically tested by others (see, e.g. Symons et al., 2017). Concerning contact risks, cyberbullying victimization, cyberbullying perpetration, and accepting friend's requests from strangers were assessed. In order to gain more detailed information, the medium through which the cyberbullying victimization was experienced was specified (SMS, SNS, Instant Messaging (IM), or email). A clarification on the concepts of cyberbullying victimization and perpetration was provided. Regarding content risks, watching violent content and sexually related materials were included. Considering that sharing photos showing defiant behavior, smoking or drinking alcohol at parties (own pictures or pictures from others) (Huang et al., 2014; Marwick & Boyd, 2014), as well as paid gambling (Cho & Cheon, 2005; Livingstone & Haddon, 2008; Floros et al., 2013), have been revealed in literature as risk-increasing online behaviors, three items were added to assess these online activities. In total, 11 items (Table 2) were assessed (*Cronbach Alpha*: parents= 0.855; adolescents= 0.810; adolescents' friends=0.861). For each item, the respondent was asked to indicate on a five-point Likert scale how often this has already occurred in the past, ranging from "never" (score 1) to "rarely", "sometimes", "often", and "very often" (score 5).

*Parental mediation strategies* were assessed through 12 items (Table 3) related to both restrictive (e.g. placing computer in an open area) and active mediation (e.g. talking openly about adolescents' online activities). Items were adapted from Cottrell et al. (2007) and Livingstone et al. (2011). One question was added to analyze if parents had already punished their children for not following rules as part of their mediation strategies. Response choices to these items were "yes", "sometimes", and "no." For the present analysis regarding both parents' and adolescents' perspectives of parental mediation strategies, the

category “sometimes” was merged with the category “yes” (*Cronbach Alpha*: parents= 0.729; adolescents= 0.696).

One general question regarding the extent to which parents (*I believe that I am aware of what my child does online*) and their children (*I share what I do online with my parents*) agree/disagree that adolescents share their online activities with parents was assessed (Table 4), respectively, through a 5 point-Likert scale anchored from 1 (totally disagree) to 5 (totally agree).

Aiming to assess the extent to which parents and adolescents have different perspectives regarding *prevention actions* that are believed to be more important regarding the maintenance of safety in an online environment, an open-ended question was included in the questionnaire for both parents and children regarding this topic.

The adolescents’ perspective of their *family’s knowledge* of computer and online skills (mother, father, and older sibling) compared to them was evaluated through a five-point Likert scale (Table 5), ranging from “nothing” (score 1) to “more than I do” (score 5). The perspective of parents of their child’s knowledge regarding computer and online skills was assessed using the same scale.

### **3.4 Data Analysis Instruments**

The paired samples T-test was used to determine whether the means between adolescents’ versus parents’ reports differ on their perspectives of adolescents’ online activities and risky behaviors (Symons et al., 2017). The One-way ANOVA was utilized to determine whether there were statistically significant differences between the means of two or more independent groups. This statistical technique was used to analyze if the gender of parents and their children, as well as adolescents’ school year (independent variables) significantly explain the perspectives of adolescents’ risky online behaviors (dependent variable). The same technique was performed to analyze if adolescents’ gender and school year (independent variables) significantly explained the adolescents’ perspective regarding their family’s knowledge (mother, father, and older sibling) compared to their own perceived knowledge. The One-way test was selected, considering that the dependent variables were assessed by an interval scale (1-5). The present study follows the line of research that advocates that Likert scales can be approached as interval scales and, therefore, they can be treated as metrics. According to literature, it is possible to develop arithmetic operations (such as averages) from a Likert measurement scale, provided there is a caution to ensure that the qualitative scale is constant, and can be assumed to have properties of interval scales (Lattin et al., 2003).

The McNemar’s Chi-Square test was performed for testing differences in dichotomous variables (yes/no) between paired samples (McNemar, 1947; Symons et al., 2017). The Z test for two independent proportions was utilized to evaluate the extent to which parents and adolescents have different perspectives regarding prevention actions that are believed to be more important regarding the maintenance of safety in an online environment. The responses to the open-ended question were analyzed via content analysis. Categorization was performed with the automatic option of NVivo for word count, followed by a manual process of amalgamating words and expressions that were related to meaningful prevention strategies for safety in an online environment presented in earlier studies. This process was further verified by a second researcher.

Univariate descriptive statistics were used to analyze the profile of the sample and to calculate the averages, standard deviations and percentages regarding the different items included in the questionnaire. The software SPSS was used for data analysis.

### 3.5 Description of the Sample

There were 1016 paired-sample questionnaires validated. The sample included students from 7<sup>th</sup> to 9<sup>th</sup> grade (40.6%) and from 10<sup>th</sup> to 12<sup>th</sup> grade (59.4%). The average age for adolescents is 15.03 years old with a standard deviation of 1.847. The minimum age is 12, and the maximum is 19 years old. Girls represent 56.6% of the sample. Of the total of adolescents, 99.3% reported having a mobile phone and 44.2% having access to this device since the 5th year of schooling (about 10 years of age). Also, 90.2% of the adolescents that participated in the study reported having a Facebook account. The paired-sample concerning parents included 70.4% of mothers. Parents have a university degree (46.2%), followed by a post-graduation (24.4%), secondary school level (21.6%), primary school level (5.9%), and another level of education (2.0%). The average age is 46.44 years old with a standard deviation of 5.108. The minimum age is 30, and the maximum is 73 years old.

## 4. RESULTS

### 4.1 Online Risks

There is statistical evidence to conclude that adolescents use Facebook more (times per day) than is acknowledged by their parents  $M(\text{parents})=1.84$ ;  $M(\text{adolescents})=5.02$ ;  $T=-10.068$ ;  $p<0.01$ ). Furthermore, the average of adolescents' *friends* on Facebook is significantly different from that is reported by their parents ( $T=-2.840$ ;  $p<0.01$ ). On average, parents estimate that their children have 315 *friends*, while the children admit having, on average, 630 *friends*.

Table 2 shows that there are some significant differences with regard to the (greater) risk that parents consider their children take and what their children assume (smaller) in an online environment. In particular, parents believe that their children are more at risk of cyberbullying victimization via Internet channels ( $M(\text{parents})=1.16$ ;  $M(\text{adolescents})=1.10$ ;  $T=2.684$ ,  $p<0.01$ ), sharing own daring photos ( $M(\text{parents})=1.14$ ;  $M(\text{adolescents})=1.07$ ;  $T=4.264$ ,  $p<0.01$ ), and sharing daring photos of others ( $M(\text{parents})=1.16$ ;  $M(\text{adolescents})=1.10$ ;  $T=3.098$ ,  $p<0.01$ ). The exception when parents seem to underestimate the risks is regarding adolescents' contact to sexual-related content ( $M(\text{parents})=1.25$ ;  $M(\text{adolescents})=1.34$ ;  $T=-2.893$ ,  $p<0.01$ ). Although, on average, the level of risks is not very high, in some cases adolescents admit to having engaged on a repeated basis (excluding the item "never") in adding strangers to their online network (31.1%), and watching online violent content (29.1%) and pornographic materials (18.1%).

Notwithstanding, the online risks that adolescents report to be experienced by their "friends" are statistically different from those they report to be experienced by themselves, as well as those acknowledged by their parents (at 1% of significance level). The results suggest that the reports of adolescents' online risky behaviors may be biased by defense mechanisms related to projection.

**Table 2. Online risks: perspectives of parents, adolescents, and adolescents' "friends"**

Online risk behavior (1-5)	Parents M(SD)	Adolescents M(SD)	T (parents/ children)	Adolescents's "friends" M(SD)	T (parents')/ adolescents' "friends")	T (Adolescents')/ Adolescents's "friends")
Cyberbullying victimization via SMS	1.19 (0.566)	1.15 (0.505)	1.975	1.36 (0.719)	-5.816**	-8.883**
Cyberbullying victimization (via SNS, IM, or email)	1.16 (0.518)	1.10(0.415)	2.684**	1.33(0.719)	-6.484**	-10.593**
Cyberbullying perpetration (via SMS or the Internet)	1.08 (0.402)	1.08(0.400)	0.113	1.28(0.647)	-9.040**	-10.774**
Adding strangers to the network	1.42 (0.730)	1.47(0.805)	-1.871	1.94(1.008)	-14.656**	-15.674**
Sharing own daring photos	1.14 (0.510)	1.07(0.342)	4.264**	1.36(0.790)	-7.484**	-12.183**
Sharing daring photos of others	1.16 (0.496)	1.10(0.446)	3.098**	1.50(0.871)	-11.055**	-14.300**
Sharing own photos showing smoking/drinking in parties	1.14 (0.493)	1.17(0.577)	-1.457	1.49(0.884)	-11.604**	-12.286**
Sharing photos of others smoking/drinking in parties	1.15 (0.507)	1.17(0.573)	-0.736	1.72(1.018)	-16.477**	-17.594**
Watching pornographic content	1.25 (0.608)	1.34(0.823)	-2.893**	1.83(1.166)	-15.011**	-16.071**
Watching violent content	1.42 (0.758)	1.40(0.853)	0.627	1.79(1.046)	-9.780**	-13.170**
Online paid gambling	1.07 (0.404)	1.10(0.475)	-1.868	1.51(0.931)	-14.855**	-15.456**

\*\**p*-value <0.001

Source: Own Elaboration

ANOVA tests suggest that the adolescents' reports mentioning that their "friends" engage in risky online behaviors may be associated in some cases with adolescents' gender and, to a greater extent, their age. Regarding female gender, there are more girls reporting that their friends experience bullying victimization whether via SMS ( $M(male)=1.27$ ,  $M(female)=1.42$ ;  $F=10.448$ ,  $p<0.01$ ), or via SNS, IM, and email ( $M(male)=1.22$ ,  $M(female)=1.41$ ;  $F=19.294$ ,  $p<0.01$ ), as well as sharing photos of others drinking or smoking at parties ( $M(male)=1.59$ ,  $M(female)=1.81$ ;  $F=11.568$ ,  $p<0.01$ ). With respect to male adolescents, there are more boys expressing that their friends engage with violent ( $M(male)=1.94$ ,  $M(female)=1.68$ ;  $F=15.215$ ,  $p<0.01$ ) and sexually-related contents ( $M(male)=1.99$ ,  $M(female)=1.74$ ;  $F=11.943$ ,  $p<0.01$ ), as well as with online paid gambling ( $M(male)=1.64$ ,  $M(female)=1.42$ ;  $F=13.976$ ,  $p<0.01$ ). Regarding age, all items measured are significantly associated with the school level of the respondent, with older adolescents (10<sup>th</sup> to 12<sup>th</sup> grades) mentioning that their friends are more engaged in online risks when compared to the reports of respondents attending 7<sup>th</sup> to 9<sup>th</sup> grades. All ANOVA tests performed were statistically significant at 1% level.

With respect to their own behaviors, adolescents' gender is statistically associated with the reports of engagement in online risks, where it is more likely that boys mention they are involved in cyberbullying perpetration ( $M(male)=1.13$ ,  $M(female)=1.04$ ;  $F=12.502$ ,  $p<0.01$ ), adding strangers to their network ( $M(male)=1.55$ ,  $M(female)=1.42$ ;  $F=5.975$ ,  $p<0.05$ ), sharing own daring photos ( $M(male)=1.10$ ,  $M(female)=1.04$ ;  $F=8.801$ ,  $p<0.01$ ), as well as daring pictures of others ( $M(male)=1.14$ ,  $M(female)=1.07$ ;  $F=6.756$ ,  $p<0.01$ ), interacting with sexually-based materials ( $M(male)=1.62$ ,  $M(female)=1.13$ ;  $F=94.463$ ,  $p<0.01$ ), watching violent content ( $M(male)=1.70$ ,  $M(female)=1.18$ ;  $F=101.768$ ,  $p<0.01$ ),

and engaging in online paid gambling ( $M(male)=1.21$ ,  $M(female)=1.02$ ;  $F=42.468$ ,  $p<0.01$ ). Apart from sending own daring photos ( $F=1.331$ ;  $p>0.05$ ), the reports of adolescents on all measures on online risks are statistically associated with age, with older adolescents (10<sup>th</sup> to 12<sup>th</sup> grades) mentioning that they engage more in online risks when compared to the reports of younger respondents (7<sup>th</sup> to 9<sup>th</sup> grades).

With respect to parental reports, adolescents' gender is statistically associated with parents' perceptions related with male adolescents' being involved to a greater extent in watching pornographic content ( $M(male)=1.38$ ,  $M(female)=1.16$ ;  $F=33.325$ ,  $p<0.01$ ) and violent materials ( $M(male)=1.59$ ,  $M(female)=1.30$ ;  $F=39.115$ ,  $p<0.01$ ), as well as engaging in paid online gambling ( $M(male)=1.10$ ,  $M(female)=1.05$ ;  $F=4.974$ ,  $p<0.05$ ). Parents' gender is statistically associated only with respect to fathers believing that their children are engaged to a greater extent with sexually-based content than mothers reported ( $M(male)=1.33$ ,  $M(female)=1.22$ ;  $F=7.606$ ,  $p<0.01$ ). With regard to adolescents' age, this variable is statistically associated with parental perception of their older children being more involved in sharing own pictures drinking or smoking at parties  $M(7^{th}-9^{th} grade)=1.06$ ,  $M(10^{th}-12^{th} grade)=1.20$ ;  $F=19.750$ ,  $p<0.01$ ), or photos of others showing the same type of behavior  $M(7^{th}-9^{th} grade)=1.08$ ,  $M(10^{th}-12^{th} grade)=1.21$ ;  $F=16.175$ ,  $p<0.01$ ).

#### 4.2 Parental mediation

Parents report implementing higher levels of parental mediation than what is perceived by their children (Table 3). Regarding the strategies reported by parents, the most used is warning about Internet risks (95.4%), which is also the most reported strategy by adolescents (90.8%). Conversely, supervising texting by mobile phone (16.7%) and using blocking software (17.0%) are the strategies less popular for parents, regarding which teenagers are little aware (4.2% and 5.8%, respectively). Also, while 59.4% of parents claim to talk openly about online activities with their children, only 16.8% of adolescents believe this to happen.

**Table 3. Parental mediation: parents vs. children**

Parental mediation (yes/ no)	Parents (%yes)	Children (%yes)	McNemar's X <sup>2</sup>
Limiting the time the child can use the Internet	37.5	18.6	91.953**
Monitoring the time the child spends online	35.0	17.2	85.050**
Placing the computer in an open area within the home	53.5	37.3	87.408**
Accessing to the Facebook and email passwords	18.5	7.7	67.226**
Using blocking software for certain web pages	17.0	5.8	59.458**
Warning about Internet risks warnings (inappropriate sites, instant messaging)	95.4	90.8	17.133**
There are some forbidden online activities	44.3	19.5	119.530**
Viewing website history on computer	33.0	6.5	160.444**
Supervision of texting by mobile phone	16.7	4.2	79.085**
Warnings for spending less time on the mobile phone and ending conversations	55.3	33.6	113.769**
Talking openly about adolescents' online activities	59.4	16.8	315.018**
The child was already punished for breaking the rules	39.4	20.3	77.235**

\*\* $p<0.001$

Source: Own Elaboration

The gap between parents'/children's perspectives is reinforced by the fact that what parents believe they know about what their children do online (Table 4) is statistically

different from what adolescents admit sharing with their parents ( $T=15.143, p<0.01$ ). In particular, parents report having more knowledge than what their children admit to telling them ( $M(parents)=3.07$ ;  $M(adolescents)=2.35$ ). Noteworthy is the fact that, in the sample, while 36.2% agree that they are aware of what their children do online, only 7.4% of parents are completely sure about this knowledge. Conversely, 56.3% of adolescents disagree or strongly disagree that they share their online activities with their parents. Concerning parental reports, the extent to which they agree/disagree that they are aware of what their child does online is statistically associated (ANOVA tests) with adolescents' age. Specifically, parents believe they are more aware of their younger child's online activities ( $M(7^{th}-9^{th} grade)=3.25$ ,  $M(10^{th}-12^{th} grade)=2.95$ ;  $F=17.979, p<0.01$ ). Adolescents' gender ( $F=0.001, p=0.976$ ) and parents' gender ( $F=0.919, p=0.338$ ) do not statistically influence parents' reports regarding this variable.

**Table 4. Parents' knowledge of adolescents' online activity (%)**

	Totally disagree	Disagree	Do not agree or disagree	Agree	Totally agree	M(SD)
Parents <i>I believe that I am aware of what my child does online.</i>	5.3	33.1	18.0	36.2	7.4	<b>3.07</b> (1.094)
Adolescents <i>I share what I do online with my parents.</i>	30.6	25.7	25.9	14.0	3.8	<b>2.35</b> (1.162)

Source: Own Elaboration

#### **4.3 Computer and online skills attributed to parents and siblings**

Considering the 587 adolescents who responded to the knowledge that they attributed to both mother and father regarding computer and online skills, as well as to an older sibling, the respondents consider that their knowledge is superior to that of both parents (Table 5). Notably, the knowledge attributed to the father is statistically superior to that of the mother ( $T=-4.265; p<0.01$ ). Nonetheless, this is still considered to be less than adolescents' self-knowledge ( $M(father)=3.18$ ). The exception is the adolescents' older siblings, who are considered to have the same or greater knowledge ( $M(sibling)=4.10$ ). The latter is statistically superior to that ascribed to both parents ( $T(father/sibling)=-5.256; p<0.01$ ;  $T(mother/sibling)=-19.520; p<0.01$ ).

**Table 5. Computer and online skills attributed by adolescents to parents and older siblings (%)**

Family's knowledge compared to adolescents' (1-5)	Nothing	Much less	Less	Same	More	M(SD)
Mother	6.6	31.2	28.1	26.2	7.8	<b>2.97</b> (1.075)
Father	7.2	26.1	24.9	25.9	16.0	<b>3.18</b> (1.191)
Older sibling	4.6	5.6	4.6	45.5	39.7	<b>4.10</b> (1.036)

Source: Own Elaboration

In Table 6, the One-way test shows that there is no influence of the adolescents' gender on the degree of knowledge attributed to their father and mother. Notwithstanding, girls consider older siblings to have more knowledge when compared to the perspective of the boys ( $M(male)=3.86$ ,  $M(female)=4.29$ ;  $F=26.111; p<0.01$ ). The results also suggest that school year influences the knowledge that adolescents consider both mother and father to have, which is higher in the perspective of students attending 7<sup>th</sup> to 9<sup>th</sup> grades ( $M(regarding\ mother)=3.17$ ,  $M(regarding\ father)=3.49$ ), and lower ( $M(regarding\ mother) =$

2.84,  $M(\text{regarding father})=2.96$ ) in the perspective of students attending 10<sup>th</sup> to 12<sup>th</sup> grades ( $F(\text{regarding mother})=13.878, p<0.01$ ;  $F(\text{regarding father})=29.326, p<0.01$ ). The adolescents' school year does not significantly influence the level of knowledge that adolescents consider their older siblings to have ( $M(7^{\text{th}}\text{-}9^{\text{th}} \text{ grades})=4.08$ ,  $M(10^{\text{th}}\text{-}12^{\text{th}} \text{ grades})=4.12$ ;  $F=0.209, p=0.648$ ). Notably, when asked what online-based knowledge parents attribute to their child (respondent to this questionnaire), 47% of parents expressed that their children have more skills than themselves. ANOVA tests showed that adolescents' age, adolescents' gender, and parents' gender are not significantly associated with this variable ( $p>0.05$ ).

**Table 6. Family's knowledge compared to the adolescents: adolescents' school year and gender**

Variable	Father's knowledge					Mother's knowledge					Older siblings' knowledge				
	Sum of Squares	Df	Mean Square	F	Sig.	Sum of Squares	Df	Mean Square	F	Sig.	Sum of Squares	Df	Mean Square	F	Sig.
<b>School year</b>															
Between groups	39.666	1	39.666	29.326	0.000	15.679	1	15.679	13.878	.000	0.224	1	0.224	0.209	0.648
Within groups	791.260	585	1.353			660.938	585	1.130			628.846	585	1.075		
Total	830.927	586				676.617	586				629.070	586			
<b>Gender</b>															
Between groups	0.106	1	0.106	0.075	0.784	1.905	1	1.905	1.656	0.199	26.984	1	26.984	26.111	0.000
Within groups	822.755	581	1.416			668.476	581	1.151			600.443	581	1.033		
Total	822.861	582				670.381	582				627.427	582			

Source: Own Elaboration

#### 4.4 Prevention Actions: Parents versus Adolescents

At 1% of significance level, parents and adolescents have in general significantly different perspectives regarding prevention actions that are believed to be more important regarding the maintenance of safety in an online environment. Table 7 shows the main prevention actions mentioned at least by ten parents or adolescents. Notably, for adolescents (35.7%), "not talking to strangers" is the most important prevention action ( $Z=18.2612; p<0.01$ ), while for parents (36.7%) "not disclosing personal data" is the most important preventive measure ( $Z=-15.8802; p<0.01$ ).

**Table 7. Main prevention safety actions in the online environment: parents vs. adolescents**

Main prevention actions	% adolescents (absolute number)	% parents (absolute number)	Z test
Not contacting strangers	35.7% (363)	3.5% (36)	$Z= 18.2612$ $p= 0.000$
Not disclosing personal data (e.g. mobile phone number, address)	7.5% (76)	36.7% (373)	$Z=-15.8802$ $p= 0.000$
Privacy-preserving (e.g. not sharing too much on posts; not sharing intimate information)	2.9% (29)	14.5% (147)	$Z=-9.3068$ $p=0.000$
Only accepting "friend requests" from known persons	3.3% (33)	2.2% (22)	$Z=1.5037$ $p=0.13362$
Be careful with strange websites	1.1% (11)	1.4 (14)	$Z=-0.6037$ $p=0.5485$
Not sharing photos	1.1% (11)	1.4% (14)	$Z=-0.6037$ $p=0.5485$
Technical safety protection (e.g. anti-virus; changing user profile settings regularly)	1% (10)	3.5% (36)	$Z=-3.8776$ $p=0.000$

Source: Own Elaboration

## 5. DISCUSSION

### 5.1 Online Risks: The Discrepancies

This study found that there are discrepancies between parents' and their children's perspectives about adolescents' online risky behavior. However, unexpectedly, contrary to the findings of most earlier studies using a dyadic approach, in which parents underestimate their children's online risky behaviors (e.g. Dehue et al., 2008; Livingstone et al., 2011; Symons et al., 2017), in the context under analysis parents seem to overestimate some online risks taken by their children. These findings refer to cyberbullying victimization via the Internet, sharing their own daring photos, and sharing daring photos of others when compared to adolescents' reports. In our case, parents appear to underestimate the risk of contact only with sexually-related content. This latter finding is in line with previous research (e.g. Livingstone & Bober, 2004; Cho & Cheon, 2005; Liau et al., 2008), in which parents believe that their children engage to a lesser extent with this type of content. Noteworthy, Symons et al. (2017) found average lower discrepancies regarding cyberbullying experiences (both perpetration and victimization), as well as accepting *friend* requests from strangers when compared to watching pornographic and violent content (higher discrepancies). Regarding the remaining online risks analyzed there were no significant differences when comparing reports from parents and children. The cases of overestimation and of no apparent discrepancy in our study, such as related to cyberbullying, might be to some extent explained by the increasing focus on these forms of online risks in the media and prevention campaigns in schools in Portugal. Subsequently, parents may be more aware and concerned that their children had these online experiences. Furthermore, Sorbring (2014) identified a group of parents who worry the most, believing that their children engaged in online risks which were not reported by adolescents. Noteworthy, Livingstone et al. (2011) suggest that discrepancies are greater or less considering different countries and suggest that parents are becoming increasingly aware of online risks for adolescents.

However, when considering the defense mechanism effect, the online risks claimed to be experienced by adolescents' "friends" (reported by adolescents themselves) are greater and statistically significant in comparison to the risks reported by parents and their children. In this case, parents seem to underestimate the online risks under analysis. Although this mechanism has been absent from previous studies, when Livingstone et al. (2011) considered the "third-person effect", children reported that their "friends" of the same age would be bothered around four times more with something that they encountered in an online environment. The presence of this phenomenon may suggest that adolescents are projecting their risky behaviors onto others (Cramer, 1987). Another possible explanation is that adolescents may be assuming that their peers experience more risks than what they do in reality, which can potentially influence them to take more online risks based on the assumptions of peers' behaviors (Gardner & Steinberg, 2005; Antonopoulos et al., 2015). This idea is in line with the study from Sasson and Mesch (2014), which found that the greater the adolescents' belief that their peers support engaging in risky online activities, the greater the number of risks they were prone to engage with. Either way, the results of the present study suggest that adolescents may engage in more risks than they report.

### 5.2 Online Risks Reports: The Influence of School Year and Gender

Apart from sending own daring photos, the *reports of adolescents* regarding all types of online risks were statistically associated with age. Older adolescents (10<sup>th</sup> to 12<sup>th</sup> grades) mentioned that they engaged more in online risks when compared to the reports of younger respondents (7<sup>th</sup> to 9<sup>th</sup> grades). Regarding gender, ANOVA analyses showed that it is more likely for boys

to mention that they were involved in cyberbullying perpetration, adding strangers to their network, sharing own daring photos, as well as daring pictures of others, engaging with sexual materials, watching violent content, and engaging in online paid gambling, when compared with girls. Concerning *parental reports*, adolescents' gender is statistically associated with parents' perceptions related to male adolescents being involved to a greater extent in engaging with pornographic content and with violent materials, as well with paid online gambling. As for parents' gender, fathers are the ones believing that their children are more engaged with activities related to watching sexual content when compared to mothers. With regard to adolescents' age, this variable is statistically associated with the parental perception that their older children were more involved in sharing own pictures while drinking or smoking at parties, or photos of others showing the same type of behavior. Considering the *adolescents' reports regarding their friends' online behavior*, all online risks under analysis were significantly associated with the respondents' school level. In fact, older adolescents (10<sup>th</sup> to 12<sup>th</sup> grades) mentioned that their "friends" were more engaged in online risks compared to the reports of respondents attending 7<sup>th</sup> to 9<sup>th</sup> grades. There are also some gender-specific differences: girls reported that their "friends" engaged more in risks regarding cyberbullying victimization and sharing photos of others drinking or smoking in parties in the past; boys reported their "friends" were more involved in risks related to watching sexual and violent content, as well as with online paid gambling.

Our findings are consistent with the fact that older adolescents seem to be the ones engaging in more online risks and that parents are acknowledging this fact. This result is in line with previous studies concluding that older adolescents engage to a greater number of risky online activities when compared to younger students (e.g. Sasson & Mesch, 2014), and that parental knowledge and concerns on adolescents' risky behaviors vary according to adolescents' age (Sorbring, 2014; Symons et al., 2017). Also, the three perspectives (parents, adolescents, and adolescents' "friends") about adolescents' engagement in online risks are consistent with the fact that boys seem to be involved to a greater extent in watching violent and sexual content online, as well as being involved in online paid gambling. These findings are in line with research suggesting that boys are more likely than girls to engage in dangerous behaviors (Sasson & Mesch, 2014); in particular, engaging more with content risks (Beckman et al., 2013; Vandenbosch & Peter, 2016; Symons et al., 2017). However, while in our study boys expressed adding more strangers to their online networks compared with girls, and parents did not perceive that distinction, Sorbring (2014) identified that parents were more worried that girls (rather than boys) would contact dangerous people online. Moreover, despite the fact that in literature girls are depicted as posting more risky photos on social media than boys (Vanderhoven et al., 2014), in the current study boys reported engaging significantly more than girls in sharing pictures showing defiant behavior.

### 5.3 Parental Mediation Strategies

In this study, parents significantly reported setting more mediation strategies than what was perceived by their children (e.g. Symons et al., 2017). Regarding open-based communication, while 59.4% of parents claimed to talk openly about online activities with their children, only 16.8% of adolescents believed this to happen. Notwithstanding, even with relation to less popular strategies, such as supervising texting by mobile phone (16.7%) and using blocking software (17.0%), these approaches are not being acknowledged by youngsters (4.2% and 5.8%, respectively). This could mean that some of these restrictive-based parental mediation strategies are being performed without the knowledge of adolescents. While a combination of parental strategies seems to be used, a process which if including both warm and boundary-related approaches can be associated with adolescents engaging in fewer online negative

experiences (Rosen et al., 2008), the present results suggest that there are clear discrepancies between both groups' perspectives. While it is not possible to conclude the effect of these strategies in the adolescents' online behavior, literature stresses that for parental strategies to be effective it is key that adolescents be aware of these practices (Cottrell et al., 2007). This appears not to be the case in the present study.

The discrepancies between parents' and children's perspectives seem to be reinforced by the fact that what parents believe they know regarding what their children do online (Table 4) is statistically different from what adolescents admit sharing with their parents. Notably, while 52.8% of adolescents disagree or strongly disagree that they share their online activities with their parents, 34.0% of parents believe (agree), that they are aware of what their children do online. Additionally, only 6.9% of parents expressed being completely sure (completely agree) about this knowledge. Moreover, the extent to which parents agree/disagree they believe being aware of what their child does online is statistically associated with adolescents' age; in particular, parents believe that they are more aware of their younger child's online activities. This finding is in accordance with previous studies. For example, Livingstone et al. (2011) concluded that one in ten parents mentioned they do not know what their child does on the Internet. In this study, gender (parents and adolescents) did not statistically influence parents' reports regarding this variable, which is in accordance with Symons et al. (2017), who concluded that mothers did not have more accurate knowledge compared to fathers concerning their children's online risks.

#### **5.4 Computer and Online Skills Attributed to Parents and Older Siblings**

This study found that the level of online and computer skills adolescents attributed to their parents is significantly lower than what adolescents believe to be their skills. Although the knowledge ascribed to the father was statistically superior to that of the mother, this knowledge is still considered to be lower from the perspective of their children. The exception was the adolescents' older siblings, who were considered to have the same or greater knowledge, from the perspective of their younger siblings. This knowledge is statistically superior to that attributed to both parents. One-way ANOVA test showed that there is no influence of adolescents' gender on the degree of knowledge ascribed to father and mother. Conversely, the results suggest that school year influences the skills that adolescents consider both mother and father to have, which is higher in the perspective of students in 7<sup>th</sup> and 9<sup>th</sup> grades (younger adolescents). However, the student's school year did not significantly influence the level of knowledge that adolescents consider their older siblings to have. Accordingly, Livingstone et al. (2011) found that, on average, one-third of adolescents reported the statement "I know more about the Internet than my parents" was "very true" and one third expressed this to be "a bit true". Similarly, the researchers found that younger children were less likely to agree with this statement and gender was not considered an important factor regarding the differences among children. The most interesting finding is that, regardless of the school year, adolescents seem to ascribe more knowledge to their older siblings than to their parents. This seems to be in line with literature advocating that older siblings may play an important role in mediation strategies aiming to prevent risky online behavior targeted to adolescents. Accordingly, research stresses that a limitation of previous studies is related to the absence of variables such as the adolescents' birth order and the quality of sibling relationships (Symons et al., 2017; Maholmes, 2018), which some authors consider to be associated with adolescents externalizing and mitigating behavior problems (Feinberg et al., 2013).

## 5.5 Prevention Actions to Maintain Safety in an Online Environment

This study concludes that parents and adolescents have significantly different perspectives regarding the most important prevention actions that they believe to be key regarding the maintenance of safety in an online environment. For adolescents, not contacting strangers is the most important prevention action, while, for parents, not disclosing personal data, such as contact information, is the most important safety measure. Remarkably, in the adolescents' questionnaires, "adding strangers to the network" was found to be the online risk in which the level of engagement reported was higher when compared to other online risks: 12% of adolescents expressed having done this in the past on a repeated basis. Moreover, considering the potential defense mechanism effect, this behavior was also attributed to adolescents' "friends" as the online risk in which they engaged more frequently. Although this study cannot explain this apparent paradox, according to literature, adolescents feel that some practices developed in an online environment may be important for establishing their independence, which can be reinforced by a rebellion effect that can lead to not following safety practices that they may be aware of (Walrave & Heirman, 2011). In fact, despite their greater cognitive capacity compared to children, adolescents do not always engage in self-protection practices and may, therefore, take online risks (Robinson, 2016). Moreover, the meaning of "stranger" in the perspective of the adolescent may be different from that of adults'. Some authors stress that a substantial amount of adolescents are adding strangers to their online social networks (Vandoninck et al., 2011), which in part are "friends-of-friends", who are mostly strangers who adolescents never met face-to-face (Vanderhoven et al., 2014). This seems to be alarming, as recent research found that the larger the SNS network size and the more strangers in the SNS *friend* list, the higher is both adolescents' self-disclosure and posting regret, a process that can lead to negative emotional experiences and well-being. Conversely, having trustworthy friends in their SNS seems to lead teenagers to less post regret, according to Xie and Kang (2015).

Regarding parents, it is more likely for them to understand the notion of privacy in a more complex way, as well as the consequences of sharing personal information (Robinson, 2016). This idea can explain why parents consider not disclosing personal data as the most important preventive action to maintaining a safe online environment, in the current study. In fact, earlier research concluded that SNS users who were not concerned about personal privacy were more vulnerable to online harassment (Ang, 2015). Additionally, there are significant differences regarding the importance attributed to using technical prevention actions, such as regularly changing the SNS settings for stronger privacy protection, in which parents seem to consider this prevention measure more important than adolescents. However, in some cases, parents may feel that they do not have enough knowledge to assist adolescents in an online environment. In this particular study, when asked what knowledge they attribute to their child regarding online and computer skills, 44.7% of the parents admitted that their children would know more than themselves. Similarly, in previous studies, it was found that a significant percentage of parents expressed that they did not feel confident in helping their child to use the Internet safely (Livingstone et al., 2011). Hence, the relevance of the development of up-to-date literacy practices on new media and public campaigns aiming to support parents to guide their children online, as well as the involvement of diverse groups in these initiatives (Robinson, 2016), such as older siblings, as suggested above.

## 6. CONCLUSION

By applying a dyadic approach using reports from adolescents and their parents, this research offers good opportunities for exploring different perspectives between the two groups related to youngsters' behaviors regarding risky online activities, parental mediation strategies, and prevention actions. This line of research is valuable considering the increasing opportunities for accessing new media out of the home and on private devices, which makes parental mediation rely more on adolescents' disclosure (Symons et al., 2017).

This research found that the defense mechanism related to projection of behaviors onto others, which has been absent from previous studies, might be biasing adolescents' reports, a phenomenon that can prevent teenagers from not disclosing accurately risky online behaviors in which they engage with. Furthermore, considering that adolescents perceive their "friends" behaviors as riskier, teenagers may believe their peers are more involved in potentially harmful online behaviors than themselves, an effect that literature advocates can influence youngsters' risk-taking and risky decision-making (Gardner & Parke, 2005). Moreover, considering that the older sibling is the only member of the family unit having the same or more online and computer skills as the adolescents', from the perspective of the youngsters, older siblings seem to be important in supporting parents in mediation strategies and future campaigns focused on online education and prevention behaviors addressed to adolescents.

Since the process of adding strangers to their network is an activity appealing to adolescents, prevention work should focus on the benefits of building a trustworthy network of friends in online social networks (Xie & Kang, 2015). Also, reports from both adolescents and parents are clear in that older adolescents are the ones engaging in riskier online activities that can be potentially harmful. Therefore, it is crucial to reinforce and clarify the role of safety practices in an online environment, by addressing adequate, up-to-date literacy and education about SNSs, not only to adolescents from early ages but also to parents. Indeed, in some cases, parents reported that their children have more online and computer skills than themselves. Moreover, parental mediation strategies should be made aware and explained to adolescents to be effective. Also, prevention and intervention strategies should be multi-systemic (Ang, 2015; Maholmes, 2018), by adopting a trust-related approach, in which different perspectives should be balanced aiming to mitigate potentially harmful behaviors while maximizing online consumption experience benefits and contributing to adolescents' well-being.

As limitations of this research, although the study acknowledges the role of older siblings as a protective factor aiming at safer Internet use by adolescents, this particular group was not included in the data collection. Subsequently, future research could analyze in-depth these relationships and the extent to which older siblings could be addressed in strategies aiming to mitigate adolescents' online potentially harmful behaviors, which include social marketing programs. Moreover, parents were addressed as one group and a triadic approach (adolescent, mother, and father from the same family) was not undertaken. However, a previous study using this approach concluded that there were no significant differences among father's and mother's knowledge about adolescents' online risks (Symons et al., 2017). Additionally, future research could address diverse family structures (Pearce et al., 2018). Secondly, the data were collected in only one region of the country, although the schools included in the research were public and diverse sociodemographic profiles were represented. Previous research considers this process to be adequate since existing literature advocates that adolescents' online experiences do not differ significantly among teenagers living in different regions of the country, whether rural or urban areas (Sorbring, 2014). Lastly, although for more complex concepts a definition was provided (e.g. cyberbullying

victimization), since this study used a self-administered approach, different conceptual understandings about online risks, parental mediation strategies, and prevention actions might have influenced responses in some cases. In future studies, a mixed approach by adding a qualitative component may help to clarify specific discrepancies among reports.

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