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Sex differences in cyberbullying behavior and victimization and perceived parental control before and during the COVID-19 pandemic

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A B S T R A C T

This study explores the associations between social media user sex and cyberbullying and victimization before and during the COVID-19 pandemic. Parental control was examined as a possible moderator of these associations, and time spent online as a mediator during the pandemic. A sample of 5658 fourth to twelfth graders (48% girls; age $M = 13.32$ SD: 2.12) answered an online survey investigating their use of digital tools and their perception of parental control before and during the pandemic. Girls were engaged more often in cyberbullying than boys during the pandemic, while boys were more often cybervictimised than girls during the pre-pandemic period. Mediation and moderated-moderation regression models revealed that social media user sex was associated with cyberbullying and cybervictimization during the pandemic and also with cybervictimization before the pandemic. Parental control was a protective factor against cyberbullying for boys both before and during the pandemic: during the pandemic this protective effect worked through the amount of time spent online. The study findings have been interpreted based on the differences between boys and girls in social media use and digital tools and in parental control of online activity.

1. Introduction

With the spread of social networks, bullying has invaded the Internet and assumed the form of cyberbullying. What distinguishes cyberbullying from real-world bullying is that it is *perpetrated electronically* through mobile devices and social media sites used to harass and threaten victims (Terry & Cain, 2016; Smith et al., 2008). A fictitious profile can keep the cyberbully's identity anonymous (Terry & Cain, 2008). Furthermore, the power imbalance caracterizing bullying, in cyberbullying relies on the ability to (mis)use digital and social skills, specifically on the ability to use the "Information and Communication Technologies" (ICT) (Patel & Conklin, 2009).

1.1. Sex differences in cyberbullying, in social media use and time spent online

Findings on sex-related differences in cyberbullying are discrepant. A high prevalence of cybergossip among girls has been associated with their engaging in bullying and cyberbullying (aggression and victimization) (García-Fernández, 2022). Some studies have found that boys are engaged more often than girls in episodes of cyberbullying (Lee et al., 2018), while others report no differences between the sexes (Hinduja & Patchin, 2014). Some differences concern the time spent online: girls seem to spend longer hours than boys on social media

(Smith et al., 2018; Zsila et al., 2019; De Felice et al., 2022) and girls access social networks through smartphones and computers, whereas boys spend more time playing online games (Booker et al., 2015).

Another difference is that girls use social media mainly as a tool for social comparison with peers, for enhancing visibility, and for receiving positive feedback; indeed, they attribute importance to the type of likes and comments they receive (Nesi & Prinstein, 2015; Yau & Reich, 2019), and, girls who want to shine on social media seem to be concerned about their weight (Tiggemann & Slater, 2017).

An uninformed and irresponsible use of ICT tools invites danger. Parents can protect their children against cyberbullying by monitoring their online activities and use of smartphones, computers, and other devices to access the Internet. What remains unclear, however, is the extent to which parental mediation strategies are effective in ensuring safe use of social media (Cavallini & Caravita, 2021). Parental strategies for correct use of social media and prevention of cyberbullying may vary based on user age, sex, and time spent online.

1.2. Cyberbullying and parental mediation

The literature distinguishes two parental strategies for safe use of ICT tools and media: parental mediation and parental monitoring (Beyens et al., 2022). Parental mediation comprises prevention strategies to control the ways young people use social media and to teach them rules

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about appropriate use of digital devices (Livingstone & Helsper, 2008). For example, parental mediation is when parents limit the amount of time that their children spend on social media and clearly explain the dynamics of social media to their children to moderate the effects of social media exposure (Nathanson, 2001). Parental media monitoring refers to how parents check their children's digital routine: the amount of time spent online, when they access social media, the persons with whom they interact, and what they do online (Smetana, 2008).

Studies have examined the relationship between parental control and cyberbullying and cybervictimization (i.e., being bullied while on-line or receiving threats) (Fousiani et al., 2016; Sasson & Mesch, 2017; Wang et al., 2009). Parents can limit their child's use of social media and time spent online or talk to them about how to make responsible and informed use of social media (Livingstone, 2007; Sasson & Mesch, 2017).

In their study, Navarro and collegues (2013) found that parental supervision alone does not work as a preventive measure against cyberbullying but rather that cooperation between parents and children in establishing rules for using the Internet is a stronger protective factor. Sasson and Mesch (2018) reported that since children can easily circumvent parental rules, parents need to participate in their children's use of ICT tools. Nonetheless, Marano (2008) and Nelson (2010) suggested that excessive parental control can increase the risk that their children experience depression. In a study involving 800 primary and secondary school students, Marano (2008) reported that higher levels of perceived parental control correlated with higher levels of cyberbullying. Furthermore, no parenting strategy has been found that can be protective for both boys and girls (Wright, 2017). A systematic review of 154 studies (Nocentini et al., 2019) reported that while parental supervision and monitoring constitute protective factors against cyberbullying, the effect of overprotection remains unclear and the study findings are inconsistent. More research is therefore needed to determine whether parental mediation can be a protective factor against cyberbullying differentiated by social media user gender.

1.3. Sex differences in parental control

In their study, Baldry and colleagues (2019) found significant sex-related differences in cyberbullying in relation to parental monitoring and control. The study sample consisted of 4390 Italian adolescents. Among the boys who were victims of cyberbullying, 39.1% reported that they had not received online education from their parents and 29.3% that their parents did not monitor their online activities. Among the girls who were cyberbullied, 28.9% reported that their parents did not monitor their online activities (Baldry et al., 2019).

The role of parents in preventing cyberbullying and child protection policies in relation to social media user sex is understudied in the current literature (Baldry et al., 2019). In a study involving 568 U.S. adolescents (age range, 13–15 years), Wright (2017) found that restrictive parental strategies were a protective factor for girls but not for boys.

1.4. The COVID-19 pandemic

In many countries, including Italy, during COVID-19 lockdowns, children and adolescents socialized almost exclusively with their peers through social media and they used digital applications and platforms to receive remote learning (Deslandes & Coutinho, 2020). Previous studies have suggested that use of educational platforms and interaction via the Internet increase the occurrence of cyberbullying and other forms of online violence (Kee et al., 2022), with a higher risk of cyberbullying for children during the COVID-19 lockdown.

A survey by Connected Generations (https://terredeshommes.it/com unicati/bullismo-cyberbullismo-parlano-ragazzi-dati-dellosservatorio-indifesa/) presented on Safer Internet Day, 9 February 2021, reported that during the lockdown 1 in 5 respondents stated they were almost always connected and 6 in 10 were online 5–10 h a day. These rates were

twice those recorded for 2019 before the pandemic. An increase in cyberbullying incidents was experienced by 59% of students in 2020: 61% stated that they had been cyberbullied or bullied and 68% reported that they had witnessed episodes of cyberbullying. Girls felt less safe on social media and feared instances of revenge porn in particular. Overall, 6 out of 10 students stated that they did not feel safe online. The survey also reported an increase in unwanted contacts, fake news and sexting, hate speech and discrimination.

1.5. Present study

With the present study we wanted to determine whether sex-related differences exist in cybervictimization and cyberbullying (before and during the COVID-19 pandemic) and whether parental control, as perceived by children, increases or decreases the risk of being cyberbullied or engaging in cyberbullying. We also investigated the role of parental control as a moderator of the association between social media user sex and cyberbullying and cybervictimization, taking into account the greater number of hours spent online during the COVID-19 lockdown.

Our research questions were:

1. Is social media user sex associated with online risks of engaging in cyberbullying and experiencing cybervictimization, and did these associations differ during the COVID-19 pandemic? Drawing on the literature, we hypothesized that before the pandemic girls were more at risk than boys of engaging in cyberbullying and experiencing cybervictimization (Buelga et al., 2017; Beckam et al., 2013).
2. Did the time spent online mediate the association between social media user sex and cyberbullying and cybervictimization during the COVID-19 pandemic? Our hypothesis was that the longer time spent online was associated with an increase in cyberbullying and cybervictimization during the pandemic (Cavallini & Caravita, 2021), with girls at higher risk because they spent more time online than boys (Yau & Reich, 2019; Tiggemann & Slater, 2017).
3. Is parental control a protective factor against engaging in cyberbullying and experiencing cybervictimization different for boys than for girls? Our hypothesis was that greater parental control was associated with more frequent episodes of cyberbullying and cybervictimization among girls but not boys (Baldry et al., 2016).
4. During the COVID-19 pandemic, did parental control mitigate the differential risk between boys and girls of cyberbullying or cybervictimization by moderating the association between social media user sex and the amount of time spent online? Our hypothesis was that parental control mitigated the differential risk for boys and girls of cyberbullying or cybervictimization by moderating the association between social media user gender and the amount of time spent online (Baldry et al., 2019), taking into account the differences in use and reasons for use between boys and girls (Whittaker & Kowalski, 2015).

2. Materials and methods

2.1. Participants

Participants were 5658 Italian children and adolescents (age range, 8–19 years, $M = 13.32$ SD: 2.12; 2944 boys and 2714 girls). Six primary schools in the province of Pavia, 20 lower secondary schools (4 in the city and 16 in the province of Pavia) and 11 upper secondary schools (5 in the city and 6 in the province of Pavia) were involved. Twelve schools that had attended the preliminary remote information meeting withdrew participation from the study. The rate of student participation was 90% and a total of 80% of the students attending the 37 schools participated. In all, 10% of participants were excluded from analysis because they did not respond to the items of interest (i.e., the items on cyberbullying and cybervictimization before and during the pandemic,

non-school hours spent online, and perceived parental control).

2.2. Measures

This study is part of a larger research project on the use of computers by adolescents (e.g., having fake profiles), the quality of relationships with reference adults, how youth use online platforms for remote learning, and the relationship between cyberbullying and remote learning during the national COVID-19 lockdown (March-April 2021). For the present study we were interested only in cyberbullying and cybervictimization and parental control and selected the variables of interest accordingly. The government-imposed lockdown of February 2020 confined school students to home where they received instruction via remote learning. The self-report questionnaire was developed under circumstances in which school students could communicate with peers and family only via social media. Demographic data were collected, including user sex (male = 1, female = 2); the questionnaire was composed of 20 items investigating the students' use of digital tools before and during the COVID-19 pandemic. For this study we considered the following areas.

1. Cybervictimization before the pandemic: The item "Have you ever experienced cyberbullying?" had multiple response options of which more than one could be selected: "Yes, I have been a victim of cyberbullying." (scored 1); "Yes, I have been a cyberbully." (scored 2); "I have witnessed acts of cyberbullying but was never directly involved." (scored 3); "I have been both (cyberbully and cybervictim)." (scored 4); "No, I have never experienced cyberbullying." (scored 5). For the analysis, the variable of interest "Yes, I have been a victim of cyberbullying." was isolated and assigned a score of 0 for respondents who had not had that experience and a score of 1 for those who had. The variable was thus converted into a dichotomous variable.
2. Cyberbullying before the pandemic. The item "Have you ever experienced cyberbullying?" had multiple response options of which more than one could be selected: "Yes, I have been a victim of cyberbullying."; "Yes, I have been a cyberbully."; "I have witnessed acts of cyberbullying but was never directly involved."; "I have been both (cyberbully and cybervictim)."; "No, I have never experienced cyberbullying." For the analysis, the response of interest "Yes, I have been a cyberbully." was isolated and assigned a score of 0 to those who had not had that experience and a score of 1 to those who had. The variable was thus converted into a dichotomous variable.
3. Cybervictimization during the pandemic. The item "Indicate whether anything similar happened to you in remote learning class during the COVID-19 pandemic." had eight response options (multiple answer option), including "I have been teased by classmate(s) in chat on the social platform for remote learning (Meet, Zoom, etc.). For the analysis, a score of 0 was assigned the respondents who had not been teased and a score of 1 for those who had. The variable was thus converted into a dichotomous variable.
4. Cyberbullying during the pandemic. The item "Indicate whether you experienced anything similar during the COVID-19 pandemic in social relationships with your friends and/or classmates." had six response options (multiple answer option), including "I have engaged in social teasing of a classmate, friend or acquaintance." For the analysis, a score of 0 was assigned the respondents who had not had that experience and a score of 1 to those who had. The variable was thus converted into a dichotomous variable.
5. Time spent online. Responses to the item investigating the amount of non-school hours spent online during the COVID-19 pandemic "How many non-school hours a day do you spend online on average?" were rated on a Likert scale: less than 1 h (scored 1); 2 h (scored 2); 3 h (scored 3); 4 h (scored 4); 5 h (scored 5); more than 5 h (scored 6).
6. Parental control. Responses to the item investigating parental control "Do your family members monitor your Internet activities?" were

rated on a 4-point Likert scale with the anchors: Not at all = 1; Slightly = 2; Somewhat = 3; Much = 4; Very much = 5.

2.3. Participant recruitment and data collection

Data were collected during the national lockdown of March-April 2021. The questionnaire was posted on an online platform with a link to access it. Participation in the study was requested from school principals and teachers by written invitation sent to the schools in the city and the province of Pavia. The school principals were also invited to attend an online meeting during which they were informed about the study objectives and could ask the research teams details about the logistics of the study. Students were recruited from the schools that accepted the invitation to participate. A letter describing the research project and requesting parental informed consent was sent to the students' families by the participating schools. The parents/legal guardians who granted their child's participation returned an electronic, signed consent form to the schools, which forwarded it to the researchers.

Data collection took 20 days. The questionnaire was administered via a platform which was opened at an agreed time point so that the teachers could assist with questionnaire administration (children with severe cognitive impairment were excluded). The questionnaire was designed for the age group of the present study and the teachers were instructed in how to help students complete it. No difficulty in completing the questionnaire was reported. The questionnaire took approximately 45 min to complete.

2.4. Statistical analysis

For the descriptive analysis, we used the IBM-SPSS statistical software package (IBM-SPSS, Armonk, NY, USA) to compute intercorrelation indices and performed the T-test to compare responses. We ran multiple moderation[1] and moderated-mediation[2] regression models tested in Hayes' PROCESS models 1 and 7[3] to determine associations between user sex (predictor) and cyberbullying and cybervictimization (before and during COVID-19 lockdown) as criterion variables. Four models were tested. In model 1 we investigated research questions 1 and 3, referring to the pre-pandemic period, by entering cybervictimization before the pandemic as the criterion variable, user sex as the predictor, and parental control as the moderator. In model 2, cyberbullying before the pandemic was the criterion variable, user sex the predictor, and parental control the moderator (research questions 1 and 3 pre-pandemic). Models 1 and 2 are shown in Fig. 1. In model 3, cybervictimization during the pandemic was the criterion variable, user sex the predictor, time spent online the mediator of the association between user sex and cybervictimization, and parental control the moderator of the association between user sex and time spent online. Model 4 was identical to model 3 except that cyberbullying during the pandemic was the criterion variable. Models 3 and 4 referred to research questions 1, 2, and 3 during the pandemic. To correct for type 1 error, significance was set at $p < 0.05$. The effect size was calculated with G-POWER. Assuming a significant interaction effect (Fisher's F) with an effect size of f 0.15, a critical alpha of .05, and a power of .95, the optimal sample size was 119 participants.

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[1] The moderation model tests whether the prediction of a dependent variable, from an independent variable, changes depending on the levels of a third variable.

[2] A mediation process can be defined as moderated if the moderator variable has a weight in the indirect effect of the predictor on the criterion variable via the moderator.

[3] "PROCESS, a versatile modeling tool freely-available for SPSS and SAS that integrates many of the functions of existing and popular published statistical tools for mediation and moderation analysis as well as their integration." (cit. p. 1) (Hayes, 2015).
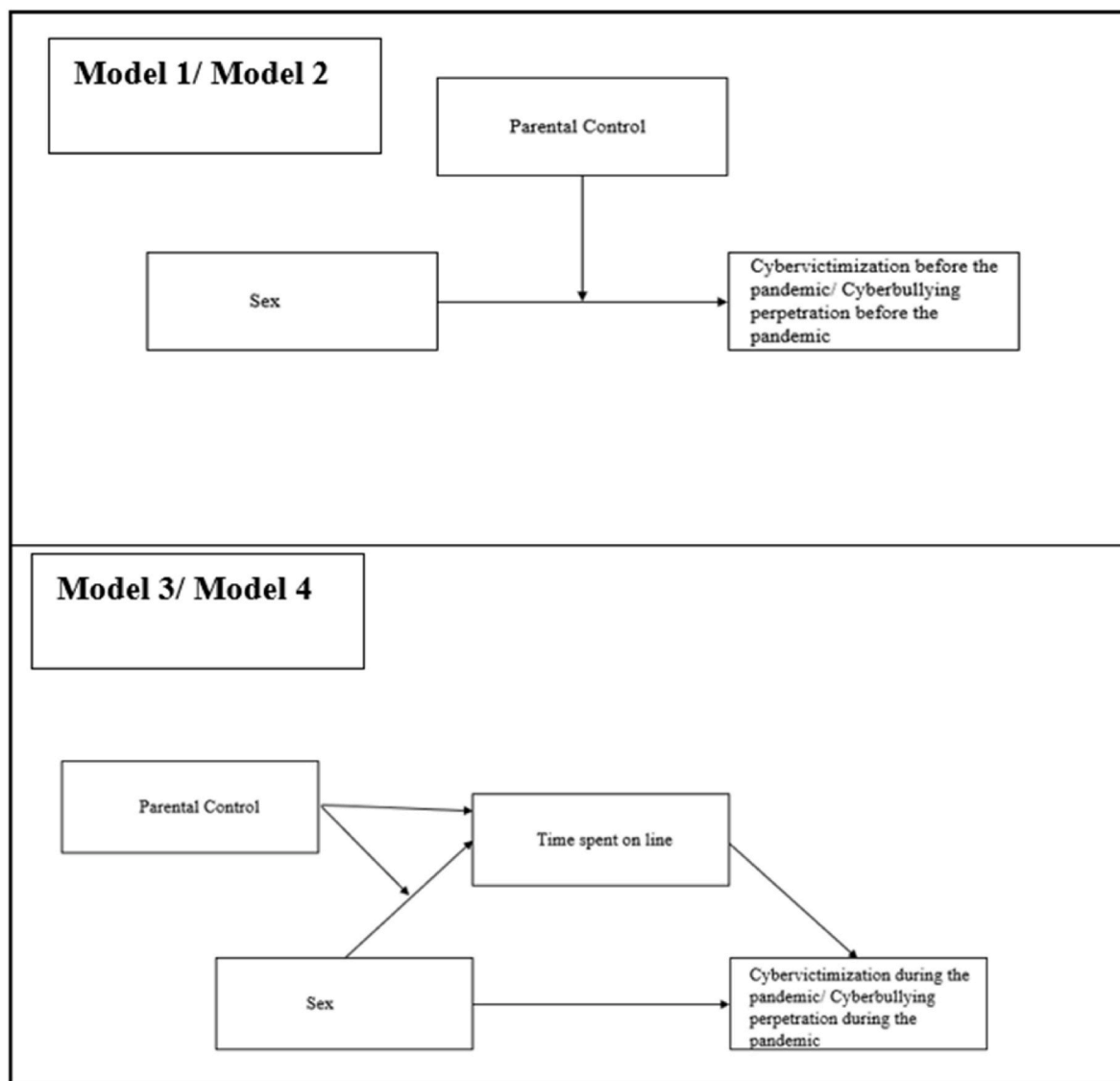
Fig. 1. Multiple regression's models Note*p < 0.05, **p < 0.01.

3. Results

3.1. Descriptive statistics

Descriptive statistics (means, standard deviation, and bivariate correlations) of the manifest variables are presented in Table 1. User sex was associated positively with cybervictimization before the pandemic and with cyberbullying during the pandemic, with higher levels of both variables for females, albeit in weak association. Time spent online was associated positively with cybervictimization before and during the

pandemic and cyberbullying before and during the pandemic. Cybervictimization before and during the pandemic was associated positively, indicating some stability in this experience over time. There were also positive correlations between cyberbullying before and during the pandemic, and between cybervictimization and cyberbullying during the pandemic. Parental control was associated negatively with time spent online and with cyberbullying during the pandemic. Males reported more often to have been victimized before the pandemic than females, $\chi2(1) = 34.861 \, p = 0.00$, while females reported engaging more often in cyberbullying than males during the pandemic, $\chi2(1) = -3.280$

Table 1

Means, Standard Deviations and Bivariate Correlations of the Manifest variables (n = 5658).

Variables	1	2	3	4	5	6	7
1. Sex (1 = Male, 2 = Female)	–						
2. Time spent on-line	−.021	–					
3. Cybervictimization before the pandemic	.078**	.079**	–				
4. Cyberbullying perpetration before the pandemic	.014	.030*	−.025	–			
5.Cybervictimization during the pandemic	.024	.058**	.108**	.017	–		
6. Cyberbullying perpetration during the pandemic	.028*	.062**	.018	.026*	.090**	–	
7. Parental control	−.007	−.299**	.003	.001	.014	−.76**	–
M (SD)/%	52%	3.73(1.478)	8.5%	7%	2.2%	.14(.824)	2.8%

Note: *$p < 0.05$ (two-tailed), **$p < 0.01$ (two-tailed).

$p = 0.3$ (Table 2).

3.2. Multiple regression

The results of the moderation models for cybervictimization and cyberbullying before the pandemic are presented in Table 3.

3.2.1. Model 1. Cybervictimization before the pandemic
There was a significant effect of user sex ($b = -0.588$, s.e. $= 0.100$, $p = 0.00$) but not of parental control ($b = -0.225$, s.e. $= 0.120$, $p = 0.06$) on cybervictimization; males reported to have been more often cybervictimized than females. The user sex-by-parental-control interaction effect was significant and positive ($b = 0.170$, s.e. $= 0.082$, $p = 0.03$). Simple slop analysis of the interaction effect revealed that males were at higher risk of cybervictimization when parental control was low to medium: sex effect of a low, $b = -.792$, s.e. $= 0.144$, $p = 0.00$, medium, $b = -0.588$, s.e. $= 0.100$, $p = 0.00$, and high level, $b = -0.384$, s.e. $= 0.136$, $p = 0.05$, of parental control.

3.2.2. Model 2. Cyberbullying before the pandemic
The multiple regression model of cyberbullying before the pandemic as the criterion showed that neither the predictors (user sex and parental control) nor their interaction was associated significantly with cyberbullying.

3.2.3. Model 3. Cybervictimization during the pandemic
The results of moderated mediation (Fig. 2) showed that user sex was not associated with time spent online ($b = -0.068$, s.e. $= 0.037$ $p = 0.07$). Female sex was associated with more frequent cybervictimization ($b = 0.346$, s.e. $= 0.18$, $p = 0.05$). Time spent online had a significant and positive association with cybervictimization ($b = 0.270$, s.e. $= 0.062$, $p = 0.00$).

The direct association between user sex and cybervictimization was significant and positive, indicating that females more often experienced being a cybervictim ($b = 0.346$, s.e. $= 0.181$, $p = 0.05$). Time spent online also had a significant and positive association with the cybervictimization ($b = 0.270$, s.e. $= 0.062$, $p = 0.00$). The interaction term sex*parental control was significantly associated with time spent online ($b = 0.086$, s.e. $= 0.03$, $p = 0.05$) (Fig. 3). Hence, the effect of parental control on time spent online was greater for males than for females.

Simple slop analysis showed that the association between user sex and time spent online was moderated by parental control significantly and negatively; it was stronger for males for low ($b = -.192$, s.e. $= 0.058$, $p = 0.00$) to medium levels ($b = -0.106$, s.e. $= 0.4$, $p = 0.00$) of parental control. User sex was not associated significantly with time spent online

Table 2
T-test between male and female (Means, Standard Deviatons, Chi-squared, Degrees of Freedom, the t statistic, p value).

		Mean (SD)/%	t/χ^2	df	p value
Time spent on-line	Male	3.76 (1.497)	1.580	5656	.092
	Female	3.70 (1.455)			
Cybervictimization before the pandemic	Male	10.6%	34.861	1	.000
	Female	6.2%			
Cyberbullying perpetration before the pandemic	Male	0.5%	1.153	1	.323
	Female	0.8%			
Cybervictimization during the pandemic	Male	1.9%	3.280	1	.072
	Female	2.6%			
Cyberbullying perpetration during the pandemic	Male	2.3%	4.553	1	.036
	Female	3.3%			
Parental control	Male	2.45 (1.205)	.493	5656	.441
	Female	2.44 (1.192)			

Note: *$p < 0.05$ (two-tailed), **$p < 0.01$ (two-tailed).

Table 3
Hierarchical regression analyses on cybervictimization and cyberbullying before the pandemic (Moderation model).

Predictor	Cybervictimization			Cyberbullying		
	b	SE	p	b	SE	p
Sex (Male = 1, Female = 2)	−.588**	.100	.000	.365	.0337	.279
Parental control	−.225	.120	.060	.423	.444	.340
Sex x Parental control	.170*	.082	.038	−.267	.267	.333
N	5658			5658		

Note$p < 0.05$, **$p < 0.01$.

for high levels of parental control ($b = 0.066$, s.e. $= 1.08$, $p = 0.27$).

Considering the indirect effect, parental control was a protective factor for males, because only at low ($b = -0.52$, bootstrap s.e. $= 0.021$, bootstrap 95% C.I.: 0.100; −0.017) to medium levels ($b = -0.028$, bootstrap s.e. $= 0.013$, bootstrap 95% C.I.: 0.058; −0.006) of parental control were males more at risk of being victims ($b = -0.018$, bootstrap s.e. $= 0.018$, bootstrap 95% C.I.: 0.014; 0.058); this effect came through the number of hours spent online.

3.2.4. Model 4. Cyberbullying during the pandemic
Considering cyberbullying during the pandemic, parental control was associated significantly and negatively with time spent online ($b = -0.496$, s.e. $= 0.48$, $p = 0.00$) and it moderated the association between user sex and cyberbullying ($b = 0.086$, s.e. $= 0.031$, $p = 0.05$). User sex was associated positively with cyberbullying; females more often reported engagement in cyberbullying than males. Considering the indirect effects, parental control was a protective factor for males because only at a low ($b = -0.050$, s.e. $= 0.019$, bootstrap 95% C.I.: 0.091; −016) to medium ($b = -0.027$, s.e. $= 0.012$, bootstrap 95% C.I.: 0.054; −0.006), but not high level ($b = 0.017$, s.e. $= 0.017$, bootstrap 95% C.I.: 0.015; 0.054) of parental control were males at risk of engaging in cyberbullying, and this effect went through the number of hours spent online.

To summarize, the mediation and moderation regression models showed that user sex was associated with cyberbullying and cybervictimization during the pandemic and with cybervictimization before the pandemic. Parental control was found to be a protective factor against cyberbullying for males before and during the pandemic. In the latter case, it worked through the amount of time spent online.

4. Discussion

With this study we investigated the relationships between social media user sex and cyberbullying and cybervictimization before and during the COVID-19 pandemic. We wanted to determine whether parental control was a risk for or a protective factor against cyberbullying and cybervictimization before and during the pandemic for males and females. During the pandemic, we took into account the amount of non-school hours spent online.

During the lockdown, all social relationships took place via social media, exposing youth to a higher risk of cyberbullying owing in part to their lack of awareness about the perils of the digital world (Vejmelka & Matković, 2021). We found an increase in cyberbullying and cybervictimization reported by females during the lockdown. Females were also at higher risk of being cybervictimized before the pandemic. Previous studies (Vejmelka & Matković, 2021; Mira et al., 2021) reported that females may be more vulnerable to online risks owing to differences in their use of social media and their reasons for such use (Baldry et al., 2019; Whittaker & Kowalski, 2015). Accordingly, our hypothesis was that the greater engagement of females in cyberbullying may derive from their use of social media to seek consensus and feedback about themselves (Yau & Reich, 2019; Tiggemann & Slater, 2017) and to communicate with others (Geng et al., 2022). In contrast, males use social media primarily for online gaming (Yau & Reich, 2019;
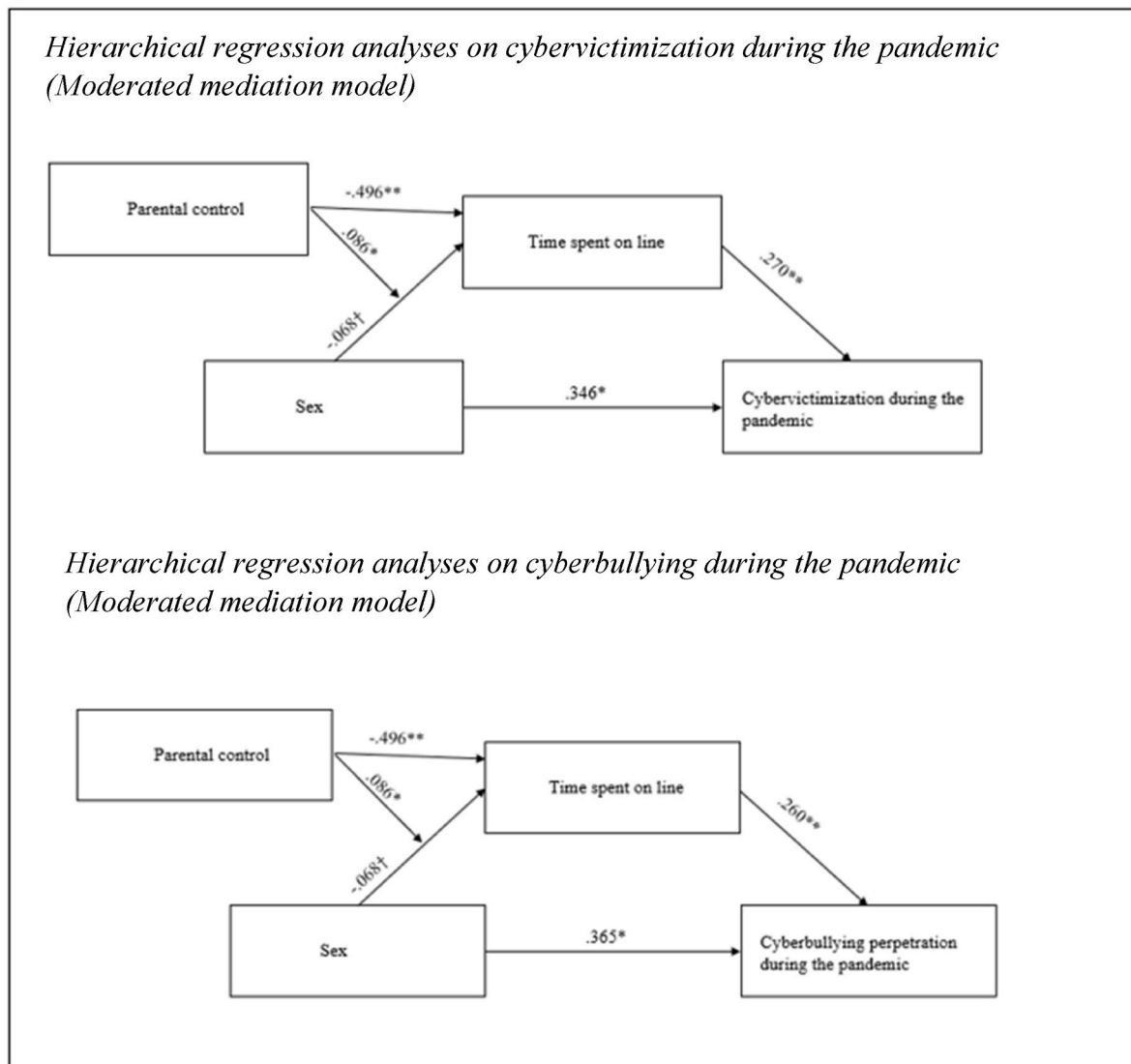
Fig. 2. Hierarchical regression analyses (moderated mediation model) Note*p < 0.05, **p < 0.01.
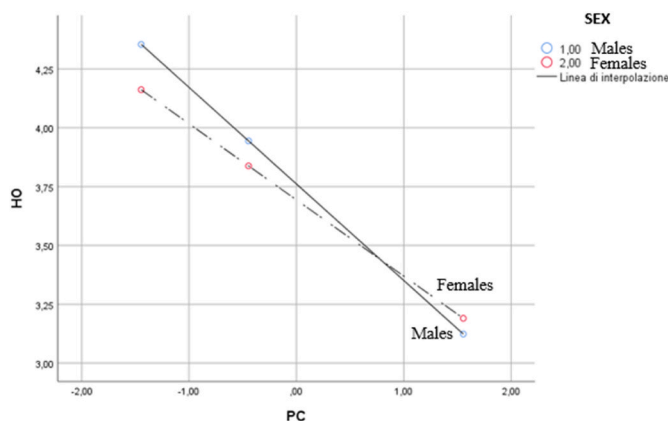

Fig. 3. Follow up analyses for the interaction term *Note*: Ho is time spent online; PC is Parental control.

Tiggemann & Slater, 2017), which might have made them less vulnerable to cybervictimization and less prone to cyberbullying during the pandemic.

Previous studies have reported that females use social media as a means to build ongoing relational bonds, whereas males are more interested in technology and sports (Morris et al., 2010). Differently from males, females tend to share more information about private life events, want to shine in appearance (Mango et al., 2008; Raacke & Bonds-Raacke, 2008; Buffardi & Campbell, 2008), and are more concerned about their reputation than males (Raacke & Bonds-Raacke, 2008). These differences may explain why in pur data females were more vulnerable to cyberbullying and cybervictimization, especially because of overexposure to social media during the lockdown. This hypothesis deserves further investigation in future research.

Another possible explanation for our results is suggested by the literature that males engage more often in physical bullying (Dehue et al., 2008) and females in verbal bullying (Slonje et al., 2013), and that females use cyberbullying more often than males in acts of relational or indirect aggression toward the victim (Björkqvist, 1994; Buelga et al., 2017; Crick et al., 2002). Unlike female cyberbullying, male cyberbullying is the online continuation of the violence perpetrated offline (Palermiti et al., 2022). Our hypothesis was that females, who are more prone to relational aggression and use social media as a relational tool, may have been engaged in cyberbullying more often than males.

Another aspect is self-esteem. The literature indicates that youths with high self-esteem may be less cybervictimized (Kim & Kang, 2016; Yoo, 2021) because not perceived as easy prey (Patchin & Hinduja,

2010). Previous studies have found that males have higher levels of self-esteem than females (Bleidorn et al., 2016; Lee et al., 2022; Kowalski, Limber, & McCord, 2019). Our hypothesis was that males would be at lower risk of being cybervictimized (Beckam et al., 2013; Li, 2007; Notar et al., 2013). Low self-esteem is also among the major risk factors for becoming a cyberbully (Patchin & Hinduja, 2010), possibly increasing the risk for females especially in such socially restrictive situations as the lockdown.

Finally, according to some studies, females report a greater need of peer support than males (Nickerson & Nagle, 2005) and are more sensitive to support from teachers, which is a protective factor against cybervictimization and cyberbullying perpetrated by females (Bokhorst et al., 2010; Malecki & Demaray, 2003). During the lockdown, young people could not interact as accustomed with their peers and teachers (Cappa & Jijon, 2021). Our hypothesis was that this factor may have affected their social life, also increasing the likelihood to engage in cyberbullying by females who need higher social support from their peers and teachers. Moreover, teachers are an important resource in preventing and counteracting cyberbullying; therefore, appropriate training (psychological, legal, computer-related) of teachers is essential to recognize situations of increased cyberbullying risk. In Italy, a law enacted in 2017 (Disposizioni a tutela dei minori per la prevenzione ed il contrasto del fenomeno del cyberbullismo, 71/2017) mandates a trained teacher as reference person in each school for students involved in cyberbullying and to promote within the school awareness of the issue (Marinoni et al., 2018). Nevertheless, since the lockdown precluded school attendance, students had limited access to this resource and were more vulnerable to cyberbullying, especially the females.

Regarding the increased time spent online, studies have shown that, before the COVID-19 pandemic, spending many hours on social media (more than 5 h a day) was a major risk factor for cyberbullying (Livingstone et al., 2011). Since females often use social media to obtain validation about themselves and to share personal experiences, the increased number of hours spent on social media could have made them more vulnerable to cyberbullying and cybervictimization (Cavallini & Caravita, 2021).

With regard to parental control, we found that higher levels of parental control were a protective factor against cybervictimization for males before the lockdown. During the lockdown, higher levels of parental control were still a protective factor against cybervictimization and cyberbullying, given the longer time males spent online. These differences in the protective effect of parental control between males and females could be because parents who keep tight control of their children limit the time spent online.

Our hypothesis was that this might also have been related to differences in the type of engagement in cyberbullying. Cyberbullying is likely to be more closely related to direct forms of attack for males and indirect forms for females (Crick et al., 2002). If such is the case, parental control may be more effective in intercepting behaviors and episodes of direct, more explicit cyberbullying than in intercepting indirect cyberbullying, therefore resulting more protective for males. It is also reasonable to assume that parents control their children's social media activities in different ways. Previous studies found that parents are more concerned about their daughter's than their son's use of social media (Bolenbaugh et al., 2020). Parents may tend to intrude more into their daughter's use social media partly because of a stereotypical conception of social media use that dictates that females are inherently more vulnerable to cyberbullying (Gini & Espelage, 2014; Hong et al., 2016). Exploration of the differences in types and styles (authoritarian vs. authoritative) (Assor et al., 2018) of control by parents with sons and daughters was beyond the scope of the present study; however, a future area of focus is greater parental control of social media use by their sons than by their daughters.

Moreover, a meta-analysis (Endendijk et al., 2016) identified different theoretical frameworks to explain why differential parental control of sons and daughters is necessary to promote their

development. Biosocial theory suggests that in many societies males and females are assigned different roles because of their biology. Females care for home and children while males provide for economic sustenance, power, and strength (Del Carmen Huerta, et al., 2013). The difference in social roles is closely linked to differences in parental expectations for sons and daughters (Wood & Eagly, 2012). Consequently, control strategies will differ in accordance with the gender roles imposed by society. According to this theory, parental control over girls is characterized by kindness, empathy, and personal closeness, whereas parental control over boys is characterized by dominance (through control strategies) (Ember & Ember, 1994). According to gender schema theories, control strategies may depend on gender stereotypes, which lead to stricter and more rigid control for males and gentler control for females (Bem, 1981). This cultural background could explain why imposing stricter parental control has no or little effect on females. This hypothesis deserves further research.

Summarizing, females may be more vulnerable to online risks for a variety of reasons, including differences in their use of social media and their reasons for this use (Baldry et al., 2019; Whittaker & Kowalski, 2015). We noted an increase in cyberbullying and cybervictimization during the pandemic lockdown among females. But ferrmales were also at higher risk of being cybervictimized before the pandemic. The more frequent engagement of females in cyberbullying may be explained by their greater use of social media to seek consensus and validation (Yau & Reich, 2019; Tiggemann & Slater, 2017) and to communicate with others (Geng et al., 2022).

These differences in digital use between the sexes may explain why females were more vulnerable than males to cyberbullying and cybervictimization, especially because of overexposure to social media during the lockdown. Massive use of social media during the lockdown prompted us to hypothesize that females, who are more prone to relational aggression and use social media as a relational tool, may have engaged more often in cyberbullying than males. Finally, parental control may be more effective in intercepting behavior and episodes of direct, more explicit, cyberbullying than in intercepting indirect cyberbullying, therefore resulting more protective for males. It is also possible that there are sex-related differences in the ways parents control their children's social media activities.

5. Limitations and future lines of research

This study was performed under particular circumstances: students were confined at home and attended school classes remotely. They were overexposed to social media and could not relate in person with their peers. We carried out a survey to study cyberbullying and cybervictimization. Nevertheless, the non-predictability of the lockdown, which lasted several months, did not allow us to collect a second wave of data under the same conditions as the lockdown and remote learning ultimately ended. Moreover, questionnaire administration between March and April did not allow for a second wave before the end of the school year, which ends the first week of June in Italy. Another difficulty was that since the survey included students attending the higher grades of lower and upper secondary school, even if we had proceeded with a second survey wave at the beginning of the following school year, the mortality rate of the sample there would have been high. For these reasons, we could not proceed with a second data collection.

Then, our data are cross-sectional, and cross sectional studies do not clarify the causal directions of the relation between variables. As the data were collected at a single time point, it is difficult to determine the temporal sequence of events or to ascertain whether a particular variable directly influenced another. Cross-sectional data cannot capture the dynamic nature of behavior, attitudes or experience over time. The limitation of the cross-sectional nature of our data notwithstanding, the survey findings shed light on associations, patterns, and relationships between cyberbullying and cybervictimization and parental control of social media use in a very large sample. Future longitudinal research is

desirable to confirm our results.

A further limitation, as this study was part of a larger study on the COVID-19 lockdown and the use of social media, is that we assessed the variables of interest only by means of single items, mostly with dichotomic coding, as we needed to restrict the length of the survey. This methodological choice could have produced less variance, while the use of non-dichotomous scales would be useful in future research. Future studies with different measures may confirm our results about the role of parental control and social media user sex outside a pandemic. Given the complexity of the topic, it may also be interesting to investigate the role of other mediators and moderators by means of mixed methods. Finally, this was a convenience sample, as we recruited participants from schools in Pavia and its province, and only students attending the schools that accepted our invitation to participate were recruited.

A strength of the study is that, according to Italian national statistics (http://dati.istat.it/Index.aspx?DataSetCode=DCIS_POPRES1), the population of Pavia may be considered representative of the Italian population, and the large study sample allows for generalization. Nevertheless, as it was a convenience sample of the schools that accepted our invitation to participate, we mention this issue among the study limitations and suggest that future studies apply rigorous sampling techniques to confirm our results.

These limitations aside, the large study sample size and the wide age range (more than 5000 students) provide a useful basis for informing the role of parental control as a protective factor against cybervictimization and cyberbullying for males but not females. Future research needs to investigate the reasons for this sex-related effect of parental control and examine which types of parental control can be effective for both males and females. Also, parents' social media skills may be investigated as a protective factor; indeed, previous studies suggest that parents with greater competence speak more often with their children about social media use. This information could help to develop effective protective interventions differentiated by user gender that tackle cyberbullying for students and parents.

Our study findings contribute to a better understanding of the dynamics of online communication. Overuse of digital devices and social media during the lockdown has coincided with a growing use of social media by adolescents. Given that such tools are now an integral part of young people's everyday life, parents need to increase their knowledge about social media and how their children use social media in order to decide how best to intervene in their children's online lives (Álvarez-García, Pérez, González, & Pérez, 2015; Khurana et al., 2015). Knowing one's own children's virtual profile, how they use social media, and the rules of appropriate social media use are key toward developing cyberbullying prevention programs for parents.

Our findings show how males and females use social media and experience parental control differently and how young people spend time online. Digital safety intervention programs will need to take into account sex-related differences based on needs and priorities. Such programs can implement online activities, given that being online is part of daily life for young people. Educators and parents should not expect that young people give up their online activities, but rather they should try to enter their world by teaching them responsible use of the tools at their disposal.

Previous studies report that young people often consider their parents and educators unskilled in social media use. Young people may tend to distrust and not listen to reference adults they believe to be unfamiliar with the dynamics of social media. Our findings may suggest that less coercive control and more dialogue-based sharing of online activities can be a protective factor, in particular for males, and that such parental style could persuade young people to listen more to their parents. In this regard, it would be important to include parents in prevention programs, teaching them about the dynamics of social media and the importance of sharing activities with their children through honest dialogue and listening to their fears and needs.

CRediT authorship contribution statement

Carlo Marinoni: Conceptualization, Methodology, Writing – original draft. **Maria Assunta Zanetti:** Supervision, Writing – review & editing. **Simona C.S. Caravita:** Writing – review & editing, Methodology, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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