Heliyon 5 (2019) e01992

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.heliyon.com

Cyberbullying and emotional distress in adolescents: the importance of family, peers and school

Goran Livazović *, Emanuela Ham

Department for Pedagogy, Faculty of Humanities and Social Sciences, University of J. J. Strossmayer in Osijek, Croatia

ARTICLE INFO

Keywords:
Education
Psychology
Computer science
Cyberbullying
Family
School
Emotions
Adolescents
Peers

ABSTRACT

The paper examines the role of socioeconomic status, family, parenting styles, peer relations and school factors in cyber-bullying with focus on emotional consequences. A survey was conducted with 259 participants (202 female) aged 19–25. 58,1% experienced some form of cyber violence, and 56,8% did not bully others. 21% report regular cyber victimization with distinct emotional disturbance (31,3%), anger (20,8%), helplessness (13,1%) and sorrow (20,5%). Girls talk to others about cyberbullying more often (p<,05). Boys (p<,05) and younger participants cyberbully others more (p<,01). Students with lower academic achievement cyberbully others more than those with average academic success (p<,01). Cyberbullying correlates negatively with traditional protective factors in risk behaviour aetiology (family, school and peer relations). Younger male participants (p<,01), who have less educated mothers (p<,05), lower academic achievement (p<,01) and report lower satisfaction with family life, peer relations and school attainment (p<,01) represent an average cyberbully profile. Age (p<,01) and school success (p<,01) predict cyberbullying for younger and academically less efficient participants. Emotional distress and reactiveness is the strongest predictor of cyber victimization (p<,001), while cyber victimization represents the strongest predictor for cyberbullying perpetration (p<,001). Peer pressure positively predicts cyber victimization (p<,01). Finally, lower family life quality predicts cyber victimization (p<,001), as well as cyberbullying perpetration (p<,05).

1. Introduction

In this article, we present an analysis of survey results with 259 participants relating to adolescents' experiences of cyber violence perpetration and victimization from the perspective of the *General aggression model* (GAM) focused on the personal and situational factors at play. GAM encompasses various cognitive knowledge structures such as scripts and schemas and emphasises three main areas: personal and situational inputs; cognitive, affective and arousal routes that influence the present internal state; and the appraisal and decision-making processes that influence behaviour (Anderson and Bushman, 2002). It provides a framework that integrates domain specific theories of aggression and was utilized in previous research on bullying behaviours (e.g. Anderson and Bushman, 2002, Gullone and Robertson, 2008; Vannucci et al., 2012, Kowalski et al., 2014: 1110). Our study aims to describe the role of emotional consequences and risk-protective factors related to family, school and peer relations. We present an analysis of significant socioeconomic, family, school and peer relation factors predicting cyberbullying perpetration and cyber victimization among adolescents, as well as the most important empirical conclusions.

1.1. Theoretical background

One of the consequences of adolescence is that, as the number of settings in which adolescents engage with peers, while the social surroundings increase and become more complex, so do the contexts in which they experience peer victimization. As social media becomes more accessible and relied upon, nurturing real-life self-concepts becomes inadequate, while more adolescents find personal popularity and value in the virtual space a necessity (Dilmac, 2014). The pressure and fear of "missing out" on social interactions becomes omnipresent. The need for connection and peer recognition in virtual communities exposes individuals to potentially harmful online judgement and attention, often experienced as *cyber victimization*. Cyberbullying perpetration indicates "*repeated violation, harassment and ridicule of others online, or using mobile phones or even other electronic devices*" (Patchin and Hinduja, 2012), or

* Corresponding author.
E-mail addresses: glivazovic@ffos.hr, goran_livazovic@yahoo.com (G. Livazović).

https://doi.org/10.1016/j.heliyon.2019.e01992
Received 17 September 2018; Received in revised form 27 May 2019; Accepted 18 June 2019

"*aggression that is intentionally and repeatedly carried out in an electronic context against a person who cannot easily defend him – or herself* " (Kowalski et al., 2012b). It is defined as the use of information and communication technology for intentional, repeated and hostile behaviour with one aim – to hurt others (Belsey, 2004). Cyberbullying contains four main components: (a) intentional aggressive behaviour; (b) repeated occurrence; (c) perpetrator and victim power inequality; and (d) use of technology (Kowalski et al., 2014). Willard (2007) indicated a taxonomy of types of cyberbullying: 1) flaming (i.e., an online fight), 2) harassment (i.e., repetitive, offensive messages), 3) outing and trickery (i.e., soliciting personal information from someone and then electronically sharing that information without the individual's consent), 4) exclusion (i.e., blocking an individual), 5) impersonation (i.e., posing as the victim), 6) cyber-stalking (i.e., sending repetitive threats), and 7) sexting (i.e., distributing pictures of another individual without that person's consent). Research indicates increasing trends in the number of pupils who have committed cyberbullying perpetration or experienced cyberbullying as victims (Slonje and Smith, 2008; Yang and Salmivalli, 2013; Đuraković et al., 2014). In general, cyberbullying victimization prevalence ranges between 10 and 40% (e.g., O'Brennan et al., 2009; Lenhart, 2010; Pontzer, 2010; Kowalski et al., 2014: 1109).

1.2. Individual factors in cyber victimization

Research suggests specific **gender** differences in the prevalence and type of bullying. Boys report higher cyber violence perpetration, more direct violence and a tendency toward longer exposure to bullying, but that there were no gender differences in victimization rates (Li, 2006; Makri-Botsari and Karagianni, 2013). Girls, on the other hand, prefer indirect forms such as relational violence or social exclusion (Olweus and Limber, 2010). Still, findings on the role of gender remain inconclusive. Some studies found that girls are more likely to experience cyberbullying as both victims and perpetrators (Kowalski and Limber, 2007), while other authors found no significant difference between girls and boys in cyberbullying perpetration or victimization (e.g., Hinduja and Patchin, 2008; Slonje and Smith, 2008; Smith et al., 2008; Ybarra and Mitchell, 2004a; see Kowalski et al., 2014).

In their meta-analysis, Kowalski et al. (2014) reported there is relatively consistent evidence of decreases in bullying rates with **age** – Currie et al. (2012), Due et al. (2009) and Fleming and Jacobsen (2010) all reported statistically significant age-related declines, although age was not statistically significant in Wilson et al.'s (2013) report. Recent research indicates that, even though cyberbullying is particularly prevalent among middle school children, there are developmental variations (Kowalski et al., 2012b). Studies show that peer victimization frequency declines from middle childhood, and continues throughout adolescence (Troop-Gordon, 2017). For example, Williams and Guerra (2007) found that cyberbullying increased after fifth grade and peaked during eighth grade (Hinduja and Patchin, 2008). Still, one study showed that over 30% of college students first experienced cyberbullying in college, with almost half of them (43%) reporting that the majority of cyberbullying they had experienced, occurred during college (Kowalski et al., 2012a; Kowalski et al., 2014: 1111).

Among **personality factors** that influence cyber violence, low *cognitive empathy* is a risk factor for cyberbullying perpetration. Steffgen et al. (2011) reported that among girls with high *affective empathy*, low and high levels of cognitive empathy resulted in similar levels of cyberbullying behaviours (as cited in Kowalski et al., 2014:1112). Personality traits such as narcissism and exploitativeness were linked with both traditional bullying and cyberbullying perpetration (Ang et al., 2011; Fanti et al., 2012; as cited Kowalski et al., 2014:1112). On the cyberbullying victimization side, Hunt et al. (2012) indicated that higher social intelligence protected against both traditional victimization and cyber victimization (see Schultze-Krumbholz and Scheithauer, 2009; as cited in Kowalski et al., 2014:1112).

1.3. Situational factors and the role of family, school and peers

Studies have shown that socioeconomic status (SES) and technological proficiency were positively related to cyberbullying perpetration (Wang et al., 2009; Kowalski et al., 2014), for individuals with more access to technology and a higher technical expertise (Walrave and Heirman, 2011; Ybarra and Mitchell, 2004a). The role of perceived **support** from parents, school, peers and others represents a protective factor for cyberbullying perpetration (Fanti et al., 2012; Calvete et al., 2010), but victimization as well (Ubertini, 2011; Williams and Guerra, 2007; Kowalski et al., 2014). Cyberbullies reported weaker emotional bonds with their **parents** (*trust, closeness, time spent together*), stronger discipline levels by their parents, and less frequent parental monitoring of online activities (Ybarra and Mitchell, 2004a, 2004b). Some studies indicated that both parental support and more punishment from parents reduced cyberbullying perpetration (Wang et al., 2009; Hinduja and Patchin, 2013). On the *cyber victimization* side, higher parental control, talking with parents and general parental knowledge on the whereabouts of their children were associated with less frequent cyber victimization (Aoyama et al., 2012; Taiariol, 2010; Wade and Beran, 2011). Perceived support is important in **school** settings, as well. Inhospitable school surroundings pose a risk factor as they create frustration that leads to aggressive feelings and reactions, as well as increase susceptibility to online victimization, so both victims and perpetrators of cyberbullying are at higher risk than non-victims to experience poor educational and workplace achievements (Holfeld and Grabe, 2012; Kowalski et al., 2012b, 2014; Vazsonyi et al., 2012). In a school setting, victims and perpetrators of cyberbullying are more likely to be absent, have low grades, carry weapons and have more detentions and suspensions (Ybarra et al., 2007; Li and Beran, 2005, 2007; Vazsonyi et al., 2012). Williams and Guerra (2007) found that positive school affiliation and a perception of the climate as trusting, fair and pleasant had protective impacts for both traditional violence and cyberbullying (see also Calmaestra-Villen, 2011; Cappadocia, 2009; Taiariol, 2010; as cited in Kowalski et al., 2014: 1113).

1.4. Proximal factors – the emotional aspects and outcomes of cyberbullying

Cyberbullying creates mental, emotional and social scars that have a prolonged impact on victims, but the bullies as well. Cyberbullying perpetration is often retaliation for traditional bullying victimization or previous involvement with cyberbullying as either victims or perpetrators (Dilmac, 2009; Kowalski et al., 2012c). Gradinger, Strohmeier and Spiel (2012) found that the most common motive for cyberbullying was anger (Kowalski et al., 2014: 1111). A study from 2007 indicates that teens report a range of emotions because of cyberbullying, from anger and embarrassment to indifference. Over half of cyber violence victims report feeling angry (56%); a third report feeling hurt (33%) and being embarrassed (32%), even scared (13%). Females are more likely to report all of these emotions, especially females ages 13 to 15 (NCPC, 2007: 3). Social emotional outcomes related to cyber victimization are comparable to those related to traditional bullying (Smith et al., 2008), with negative impacts on physical, social and cognitive functioning, development and well-being, ranging from psychological, academic and emotional problems, such as depression, suicidal ideation or truancy, school problems and deviant behaviours (see Brown et al., 2014; Kowalski et al., 2014). Long-term negative outcomes for the offending population include serious delinquency participation and substance abuse (Ericson, 2001; Loeber and Disheon, 1984; Magnusson et al., 1983; Olweus et al., 1999; Rigby, 2003; Tattum, 1989; as cited in Hinduja and Patchin, 2008: 137).

1.5. The profile of a cyberbully

Studies report a correspondence between traditional bullying and cyber victimization with over half of cyberbullied youth reporting

familiarity with their online tormentors – often school peers searching for indirect confrontation through anonymity (Mitchell et al., 2007; Hinduja and Patchin, 2008; Troop-Gordon, 2017). Cyber violence perpetrators often perceive themselves as anonymous, which has adverse effects, compared to traditional bullying. Research on *de-individuation* has shown that things said and done anonymously would not occur in face-to-face interactions, when the impact of a certain behaviour on the victim is visible (Diener, 1980; Postmes and Spears, 1998). For some perpetrators, recognizing that they have hurt their victim deters further bullying behaviour. With cyberbullying, the lack of direct recognition on the effect of a certain behaviour on the victim, significantly reduces chances for empathy and remorse (Sourander et al., 2010). Hinduja and Patchin (2008: 135) studied 1,378 adolescents and identified typical characteristics of cyberbullying victims and perpetrators. Computer proficiency and time spent on-line were positively related to both cyberbullying victimization and perpetration. Additionally, cyberbullying is linked to individuals who exhibit school problems (including traditional bullying), assaultive behaviour and substance use (Hinduja and Patchin, 2008; Kowalski et al., 2014: 1112). Furthermore, cyberbullies are often low self-esteem introverts or underachievers, who often feel like a victim themselves and lack basic social skills. They have difficulty expressing anger in an appropriate manner and would unlikely say or do, what they say and do in cyberspace (especially in the presence of an adult). Therefore, they use technology as a way to "get even" or vent their frustrations, and are unwilling to take responsibility for their actions (Hinduja and Patchin, 2014). The physical distance, ensured anonymity, difficulties in detecting the perpetrators, the liberty and time the bullies have in choosing their aim as well as the effects of bullying, render prevention strategies used in traditional bullying non-efficient when dealing with cyber violence (Beran and Li, 2007).

1.6. The present study

In conclusion, the present study addresses three questions: (1) What are the typical socioeconomic characteristics of cyberbullies and cyberbullying victims? (2) Is there a protective role of family, school and peer relations for cyberbullying victims, especially the parenting style? (3) What are the characteristics and the role of emotional distress in cyber victimization, and can emotional reactiveness in victims actually entice cyberbullies?

2. Materials and methods

2.1. Research goal

The aim was to examine the role of socioeconomic status, situational factors such as school, parents and peers in adolescent cyber-bullying with special focus on the emotional consequences of cyber-bullying from the perspective of the General aggression model.

2.2. Research problem

The *General aggression model* (GAM, Anderson and Bushman, 2002) emphasises personal and situational factors at play, so our research design encompassed: a) *personal socioeconomic factors* (gender, age, parent education level, family economic well-being, urban or rural residence, academic success, study programme), b) *personal and situational inputs* (family life quality, parenting style, peer relations quality, peer pressure, school attainment), and c) *cognitive, affective and arousal routes that influence the present internal state* (cyberbullying perpetration and victimization, emotional distress and reactiveness). The research was focused on explicating the role of socioeconomic status in profiling and predicting the average cyber-bully and "at-risk victim" characteristics, as well as studying the impact of traditional protective factors such as quality family and peer relations or high school attainment in the prevalence of cyber-bullying. Special emphasis was placed on the relation of cyber-bullying and emotional consequences from the perspective of the perpetrator and the victim.

2.3. Hypotheses

Based on the research aim and problems, the following hypotheses were established:

H1. gender, age and school success are significant risk factors for cyberbullying perpetration

H2. family factors, peer and school relations represent protective factors for cyber perpetration

H3. cyber-bullying has a significant impact on emotional distress in adolescents

2.4. Participants

The convenience sample was chosen to reflect the characteristics of the adolescent population. The research was conducted with 259 participants, 202 female (78%) and 57 male (22%) adolescents aged 19 (N = 62; 23,9%), 20 (N = 51; 19,7%), 21 (N = 39; 15,1%), 22 (N = 29; 11,2%), 23 (N = 37; 14,3), 24 (N = 11; 4,2) and 25 (N = 30; 11,6). The data were tested using the Shapiro-Wilk normality test for *age* (*W=.888; p=,000*) and *gender* (*W=.511; p=,000*). A total of 98 (37,8%) participants reported living in rural areas, and 161 (62,2%) live in urban surroundings. All 259 (100%) participants reported having a social media profile. The participants reported their main fields of studies were social sciences or humanities (N = 113; 43,6), art (N = 5; 1,9%), nature (49; 18,9%), technical sciences (N = 56; 21,6), biomedicine and health (N = 26; 10%) and interdisciplinary sciences (N = 10; 3,9%).

2.5. Instrument

No standardised instruments were implemented. A questionnaire was constructed for the purpose of this research. The on-line five-degree Likert-scale survey consisted of 45 questions in 4 parts. The *first* part encompassed sociodemographic traits (gender, age, parent education level, family economic well-being, urban or rural residence, academic success, study programme, social network profile). The *second* part consisted of 12 questions on family life quality. The *third* part had 16 questions on peer relations, peer pressure and school relations. The *fourth* part had 9 questions on cyber-bullying and emotional distress. An *exploratory factor analysis* using a principal component analysis with Kaiser normalization was conducted to determine the factor structure. The Bartlett's test of sphericity, which tests the overall significance of all the correlations within the correlation matrix, was significant ($\chi 2$ (820) = 9350.93, $p < 0.001$), indicating that it was appropriate to use the factor analytic model on this set of data. The Kaiser-Meyer-Olkin measure of sampling adequacy indicated that the strength of the relationships among variables was high (KMO = .92), thus it was acceptable to proceed with the analysis. Initially, 9 factors with eigenvalues greater than one were extruded, explaining a total of 75% of the variance for the entire set of variables. Additional composite variables were formed based on the factor analysis. *Factor 1* was comprised of 8 items reported on a 5-point Likert scale that explained 32.5% of the variance with factor loadings from .719 to .908 (family relations quality, $\alpha = .97$). *Factor 2* was comprised of 4 items reported on a 5-point Likert scale that explained 16.48% of the variance with factor loadings from .615 to .852 (cyber victimization, $\alpha = .89$). *Factor 3* was comprised of 4 items that explained 5,56% of the variance with factor loadings from .780 to .913 (emotional distress and reactiveness, $\alpha = .91$). *Factor 4* was comprised of 5 items reported on a 5-point Likert scale that explained 4.84% of the variance with factor loadings from .551 to .792 (peer pressure, $\alpha = .70$). *Factor 5* was comprised of 5 items reported on a 5-point Likert scale that explained 3.83% of the variance with factor loadings from .466 to .776

(peer relations, α = .92). *Factor 6* was comprised of 2 items reported on a 5-point Likert scale that explained 3.56% of the variance with factor loadings from .237 to .426 (permissive parenting, α = .74). *Factor 7* was comprised of 2 items reported on a 5-point Likert scale that explained 3.10% of the variance with factor loadings from .423 to .682 (parental control, α = .65). *Factor 8* was comprised of 3 items reported on a 5-point Likert scale that explained 2.61% of the variance with factor loadings from .215 to .526 (school attainment, α = .89). *Factor 9* was comprised of 3 items reported on a 5-point Likert scale that explained 2.49% of the variance with factor loadings from .262 to .392 (talking to family and friends about cyber-bullying, α = .79).

2.6. Procedure

An online survey was conducted in March 2017. Participants were introduced to the research goal prior to responding and given instructions on the procedure, as well as basic definitions on cyberbullying perpetration and victimization. All participants were informed and guaranteed complete anonymity, and the research was conducted in line with the Ethical Standards for Research with Children (2003). The institutional Research Ethics Committee approved the study. All procedures performed in this research study involving human participants were in accordance with the ethical standards of the institutional and national research committee, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The data was processed using SPSS (v20.0.0) with descriptive and inferential statistical analysis, namely t-test for independent samples and one-way ANOVA, correlation analysis and linear regression analysis. We present descriptive data for items related to cyberbullying perpetration, cyber victimization and their emotional impact on participants. The t-test for independent samples, correlation and regression analysis were focused on explicating the role of socioeconomic status in profiling and predicting the average cyber-bully and "at-risk victim" characteristics, as well as testing the importance of protective factors (family and peer relations, school attainment) and the relation of cyber-bullying and emotional consequences from the perspective of the perpetrator and the victim.

3. Results and discussion

3.1. Descriptive and inferential analysis

The 259 participants had a 3,9 GPA with a total of 25,6% (N = 34) achieving a C (good), 52,6% (N = 70) achieving a B (very good) and 21,1% (N = 28) achieving an A (excellent school success). The *age* variable was recoded into 2 groups, younger (19, 20 and 21) and older adolescents (22, 23, 24, 25). As a number of studies have shown *age* to be a significant factor in cyberbullying perpetration (Kowalski and Limber, 2007; Due et al., 2009; Hobbs, 2009; Fleming and Jacobsen, 2010; Currie et al., 2012; Robson and Witenberg, 2013), we decided to test the age differences in cyberbullying perpetration and victimization for younger and older adolescents. The variable *school success* was recoded into 3 groups, lower achievement (grades 1, 2 and 3 or F, D, C), average achievement (grade 4 or B) and higher achievement (grade 5 or A). The variable *study programme* was recoded into two groups, the first (Social and Humanities/Art) and second group (STEM). The *father and mother's education* levels were recoded into 2 groups, lower educated and higher educated parents. Still, some variables were not analysed or included due to a smaller sample.

The descriptive analysis of cyberbullying among participants (Table 1) shows only 42,9% of participants were never bullied, while 69,5% report their friends never bullied others. Only 56,8% report never bullying others, while 21% are regular victims of cyberbullying. It is worrisome that 33,6% would never report cyberbullying. Only 16,6% of participants replied they would always report cyberbullying. Katzer et al. (2009) studied cyber victimization among 1,700 adolescent participants in Germany and found that out of 69% of students who used chat-rooms regularly, 35% of them had been victimized. Our results show a concerning number of participants who reported distinct emotional disturbance (31,3%), anger (20,8%), helplessness (13,1%) and sorrow (20,5%). All results from our present study are in line with previous research that found participants reporting a state of anger, sorrow, anxiety and decreasing proper efficiency after they have been cyberbullied (Raskauskas and Stoltz, 2007; Tomsa et al., 2013; Zalaquett and Chatters, 2014). In addition, depression and anxiety were significantly associated with consequent personal perpetration and victimization from cyberbullying (Yang et al., 2013). In addition to our study results, Li (2006) conducted a research with 264 students and reported that one in four students (N = 264) had been cyberbullied and almost 17% had cyberbullied others. Her research reported 53.6% of the students knew someone who was cyberbullied. Li (2006) found that over 22% of males and close to 12% of females were cyberbullies. However, females reported cyberbullying victimization more often than males (see Tables 2, 3, 4).

Table 1
Descriptive analysis of cyber-bullying perpetration and victimization items (N = 259).

Variable		Never	Rarely	Sometimes	Often	Always	∑
My friends cyber-bully others	N	180	55	18	2	4	259
	%	*69,5*	*21,2*	*6,9*	*0,8*	*1,5*	100
I was cyber-bullied by others	N	111	64	29	41	14	259
	%	*42,9*	*24,7*	*11,2*	*15,8*	*5,4*	100
I cyber-bullied others	N	147	67	25	15	5	259
	%	*56,8*	*25,9*	*9,7*	*5,8*	*1,9*	100
I was cyber-bullied by someone unknown	N	146	73	11	17	12	259
	%	*56,4*	*28,2*	*4,2*	*6,6*	*4,6*	100
I was cyber-bullied by someone I know	N	133	63	18	26	19	259
	%	*51,4*	*24,3*	*6,9*	*10*	*7,3*	100
I was cyber-bullied by a friend	N	152	71	18	11	7	259
	%	*58,7*	*27,4*	*6,9*	*4,2*	*2,7*	100
I would report cyber-bullying	N	87	40	39	50	43	259
	%	*33,6*	*15,4*	*15,1*	*19,3*	*16,6*	100
I felt emotionally disturbed	N	109	51	44	30	25	259
	%	*42,1*	*19,7*	*17*	*11,6*	*9,7*	100
I felt anger	N	107	50	48	33	21	259
	%	*41,3*	*19,3*	*18,5*	*12,7*	*8,1*	100
I felt helpless	N	119	53	53	18	16	259
	%	*45,9*	*20,5*	*20,5*	*6,9*	*6,2*	100
I felt sorrow	N	109	50	47	32	21	259
	%	*42,1*	*19,3*	*18,1*	*12,4*	*8,1*	100
I reacted the same way and cyber-bullied	N	*148*	*64*	*36*	*6*	*5*	259
	%	*57,1*	*24,7*	*13,9*	*2,3*	*1,9*	100

Based on our first hypothesis **(**H1**)**, we found that gender, age and school success were significant risk factors for cyberbullying perpetration (Table 2). The results of our t-test for gender differences show girls (M = 4,24, SD = 2,37) talk to parents and friends about cyberbullying more often, t(257) = -1,98, p < 0,05. However, boys report significantly higher cyberbullying perpetration (M = 2,00, SD = 1,28) than girls, t(257) = 2,59, p < 0,05). Faucher, Jackson and Cassidy (2014) found similar results for male cyberbullies, while Robson and Witenberg (2013) found that gender predicted involvement in traditional bullying, with boys more likely to bully than girls. In addition, Hemphill et al. (2015) found that more females than males reported being victims of cyberbullying, which indicates gender differences in cyberbullying prevalence. Moreover, Li (2006) also found cyberbullying related gender differences. In line with our results, Li's research found males were more likely to be

Table 2
T-test for gender differences (composite variables).

Variable	Gender	N	Mean	SD	t
Family relations quality	M	57	33,72	6,60	1,05
	F	202	32,25	9,91	
Peer relations quality	M	57	17,79	4,72	-,52
	F	202	18,19	5,25	
School attainment	M	57	13,81	3,74	-,89
	F	202	14,37	4,28	
Peer pressure	M	57	9,98	3,04	,66
	F	202	9,70	2,73	
Permissive parenting	M	57	5,95	1,93	-,14
	F	202	5,99	2,03	
Parental control	M	57	6,39	1,99	-,81
	F	202	6,63	2,05	
Emotional distress and reactiveness	M	57	9,88	5,71	-1,05
	F	202	10,72	5,19	
Cyber victimization	M	57	7,44	4,41	-21,
	F	202	7,56	3,83	
Talking to parents and friends after cyber bullying	M	57	3,54	2,12	**-1,98***
	F	202	4,24	2,37	
Cyberbullying perpetration	M	57	2,00	1,28	**2,59***
	F	202	1,62	,88	

Note: p<,05*; p<,01**; p<,001***.
The values presented in bold were significant. The values marked with an * represent a t-test result significant at p<.05 level.

Table 3
T-test for age differences (composite variables).

Variable	Age	N	Mean	SD	t
Family relations quality	Younger	152	31,88	9,50	-1,42
	Older	107	33,55	8,95	
Peer relations quality	Younger	152	17,69	5,37	-1,55
	Older	107	18,69	4,74	
School attainment	Younger	152	13,75	4,28	**-2,29***
	Older	107	14,94	3,91	
Peer pressure	Younger	152	9,83	2,87	,44
	Older	107	9,67	2,71	
Permissive parenting	Younger	152	5,88	2,08	-1,01
	Older	107	6,13	1,88	
Parental control	Younger	152	6,43	2,05	-1,43
	Older	107	6,79	2,01	
Emotional distress and reactiveness	Younger	152	10,79	5,48	,93
	Older	107	10,17	5,06	
Cyber victimization	Younger	152	7,89	4,08	1,71
	Older	107	7,03	3,73	
Talking to parents and friends after cyber bullying	Younger	152	4,14	2,32	,44
	Older	107	4,01	2,35	
Cyberbullying perpetration	Younger	152	1,88	1,12	**3,39****
	Older	107	1,46	,70	

Note: p<,05*; p<,01**; p<,001***.
The values presented in bold were significant. The values marked with an * represent a t-test result significant at p<.05 level.

cyberbullies, while female victims were more likely to inform adults than male. However, study results on the effect of gender are not uniform, as Robson and Witenberg (2013) found that, when the contribution of gender was considered individually, it did not significantly affect the model, F(3, 206) = .30, p = .588. Furthermore, Williams and Guerra (2007) also did not find gender differences for Internet bullying, which implies a need for further studies on the role of gender in cyberbullying victimization, as indicated in a recent meta-analysis by Kowalski et al. (2014).

The t-test for age differences showed significant differences for the variable *Cyberbullying perpetration*, t(257) = 3,39, p<,01, with younger participants reporting cyberbullying perpetration more often (M = 1,88, SD = 1,12). Unlike our results, Robson and Witenberg (2013) also found age to have a significant contribution to the model overall, t(210) = 2.20, p = .029, as age significantly predicted involvement in cyberbullying. However, their study found older participants (14–15 year old) to have higher rates of involvement in cyberbullying than younger ones (12–13 year old). Hobbs (2009: 9) studied 398 elementary pupils and found that, as with previous cyberbullying research, cyberbullying was more prevalent among older middle school and high school students. Kowalski and Limber (2007) also found that older students cyberbullied more than younger students did, which could stem from the fact that as adolescents gain more agency with age, they abandon traditional face-to-face violence and develop more complex methods of expressing aggressive behaviour, especially on-line. Our research did not establish any significant age differences for cyber victimization. Also, our results show that older participants reported significantly higher school attainment, t(257) = -2,29, p<,05, which could partially explain the age differences in bullying prevalence.

Our second hypothesis **(**H2**)** assumed that family factors, peer and school relations represent protective factors for cyber perpetration, which was confirmed partially. The t-test for differences on the mother's educational level showed significant differences only for *School attainment*, t(257) = -3,37, p < 0,01, with students of more educated mothers reporting greater school attainment than those of mothers with lower educational levels (M = 13,75, SD = 4,27). Maitra (2003) examined the current enrolment status of children, in which parental education has a positive and statistically significant effect on the educational attainment of children. To be precise, the mother's education has a stronger effect on both school enrolment and educational attainment of children (especially for children aged 6–12) compared with the father's education. Research has shown that students who reported feeling more connected to school, had reduced odds of being cyberbullied, while students who reported emotional difficulties and peer problems were more likely to be cyberbullied as well as traditionally victimised (Cross et al., 2015). Furthermore, Kowalski et al. (2014) underlined the probability of increasing vulnerability to online victimization among the students in negative school climates. The father's educational level, as well as the study programme participants enrolled, showed no significance for cyberbullying in our research sample.

One-way ANOVA was implemented in the analysis of academic achievement and involvement in cyberbullying perpetration. We found a significant difference <,05) in academic success for participants with lower academic achievement (M = 1,96), who reported cyberbullying perpetration more than those with average academic success (M = 1,56). Our results show that those with the lowest academic success cyber-bully others the most, but those most successful do not lag far behind. Lower academic achievement was associated with both perpetration and victimization from cyberbullying in a study by Yang et al. (2013). However, there have been mixed research findings on the connection between academic performance and being bullied (Swearer et al., 2010). For example, in a study by Hemphill et al. (2015), academic failure and low school commitment were not predictors of cyberbullying victimization. Obviously, future studies will have to provide additional insight on the relation of these factors with cyberbullying victimization.

Our third hypothesis **(**H3**)** assumed that cyber-bullying has a significant impact on emotional distress in adolescents. The correlation matrix shows multiple significant relations between different variables (Table 4). Parenting styles and control, as well as the family's economic status, show no significance in relation to cyberbullying, but are important for perceived family, life and school life satisfaction (p<,001). It is interesting that cyberbullying negatively correlates with most of the traditional protective factors in risk behaviour aetiology. Our results show that younger male participants (p<,01), who have lower educated mothers (p<,05), lower academic achievement (p<,01) and report lower satisfaction with family life, peer relations and school attainment (p<,01) represent an average profile of a cyberbully. On the other hand, the strongest positive correlations to cyberbullying are emotional distress and cyber victimization (p<,001). Emotional distress positively correlates with cyber victimization (r = ,71, p<,001) and talking to parents and friends about cyberbullying (r = ,69, p<,001), which was expected considering its adverse psychological consequences. Interestingly

Table 4
Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	*R*	-	,14*	,11	,07	-,03	,19**	-,067	,03	,06	-,04	,01	,05	,07	,01	,12*	**-,16***
2	*R*	,14*	-	,01	-,04	,00	-,01	,01	,01	,05	-,04	,02	,01	-,05	-,09	-,03	**-,19****
3	*R*	,11	,01	-	,24***	,12	,06	,11	,12	,19**	,04	,02	,20**	,06	,02	,09	**-,13***
4	*R*	,07	-,04	,24***	-	,14*	,01	,02	,09	,11	-,11	-,09	-,01	,10	,04	,06	,01
5	*R*	-,03	,00	,12	,14*	-	-,012	,08	,06	,12	,01	,07	,04	-,05	,03	-,06	-,06
6	*R*	,19**	-,01	,06	,01	-,02	-	,12	,02	,25***	-,02	,08	,03	-,01	-,01	,05	**-,18****
7	*R*	-,07	,01	,11	,02	,08	,12	-	**,66****	**,73****	**,20****	**,48****	**,51****	-,01	-,17**	,05	**-,18****
8	*R*	,03	,01	,12	,09	,06	,02	**,66****	-	**,59****	**,14***	**,29****	**,47****	,06	-,05	,09	**-,21****
9	*R*	,06	,05	,19**	,11	,12	,25***	**,73****	**,59****	-	**,19****	**,42****	**,45****	-,01	-,14*	,05	**-,26*****
10	*R*	-,04	-,04	,04	-,10	,01	-,02	,21**	,14*	,19**	-	,15*	,11	,09	,16*	,08	,05
11	*R*	,01	,02	,02	-,09	,07	,08	**,48****	**,29****	**,42****	,15*	-	,06	-,06	-,08	-,01	-,12
12	*R*	,05	,01	,20**	-,01	,04	,03	**,52****	**,47****	**,45****	,11	,06	-	,03	,03	,07	-,09
13	*R*	,07	-,05	,06	,10	-,05	-,01	-,01	,06	-,01	,09	-,06	,03	-	**,71****	**,69****	**,31*****
14	*R*	,01	-,09	,02	,04	,03	-,01	-,17**	-,05	-,14*	,16*	-,08	,03	**,71****	-	**,53****	**,49*****
15	*R*	,12*	-,03	,09	,06	-,06	,05	,05	,09	,05	,08	-,01	,07	**,69****	**,53****	-	**,18****
16	*R*	**-,16***	**-,19****	**-,13***	,01	-,06	**-,18***	**-,18***	**-,21****	**-,26****	,05	-,12	-,09	**,31*****	**,49*****	**,18****	-

Note: p<,05*; p<,01**; p<,001***.
The values presented in bold were significant. The values marked with an * represent a t-test result significant at p<.05 level.
Legend: *1-gender, 2-age,* 3-mom *education, 4-dad education, 5-family economic status, 6-academic success, 7-family relations quality, 8-peer relations quality, 9-school attainment, 10-peer pressure, 11-permissive parenting, 12-parental control, 13-emotional distress, 14-cyber victimization, 15-talking to parents and friends about cyberbullying, 16-* cyberbullying perpetration.

enough, research suggests that as they grow older and have fewer restrictions about the Internet, teens are more likely to report that their parents should be worried about what they do on-line (NCPC, 2007, 6).

The *regression analysis* was implemented to test the predictive significance of socioeconomic factors (*Model 1*), the importance of the risk-protective dimension (*Model 2*) and the relation between the role of parental styles, emotional distress with cyberbullying perpetration and victimization (*Model 3*). In line with the proposed hypotheses, our results show that age (β = -,17, p<,01) and school success (β = -,15, p<,01) are significant predictors of **cyberbullying perpetration** for younger and academically less efficient participants (Table 5). A study by Guo (2016) also found age to be a relatively weak, but a significant predictor (r = ,10) for cyberbullying perpetration. However, Ybarra and Mitchell (2004) found the incidence of cyberbullying slightly increases with age. When it comes to school success, Hobbs (2009: 15) found being a cyberbully was not correlated to satisfaction with school, while our results show that academic underachievement predicts becoming a cyberbully. However, our regression analysis shows an interesting connection between cyber victimization, cyberbullying perpetration and emotional distress and reactiveness. While emotional distress and reactiveness represent the strongest predictors of cyber victimization (p<,001), cyber victimization represents the strongest predictor of becoming a perpetrator (r = ,54, p<,001). The fact that our research results show a mutual predictive relation between cyber victimization and cyberbullying perpetration, could be explained with the fact that the virtual realm gives victims a forum to adopt a dominant position relative to their tormentors. Therefore, some researchers believe that students, who are bullied at school, often turn around and bully on-line (Ybarra and Mitchell, 2004). While some cyberbullies are negatively impacted by their experience, the role of emotional distress and reactiveness can be explained with the fact that many of the cyberbullies feel positive about their actions, thinking they were funny or that the victim somehow deserved the harassment, thus thriving upon the inflicted emotional damage (Patchin and Hinduja, 2006; Kowalski et al., 2012b; as cited in Hobbs, 2009: 22) (see Table 6).

Our results show that *emotional distress and reactiveness* (β = ,54, p<,001) represents the single most significant predictor of **cyber victimization**. Studies indicate that students with skills in emotional control were less likely to vicitimized (Mahady Wilton et al., 2001; Schwartz et al., 2001). In addition, emotional control was a protective factor for cyberbullying victimization in a study by Hemphill et al.

Table 5
Regression analysis for cyber-bullying perpetration (N = 246).

Cyber-bullying	Model 1 (soc.-econom. charact.)			Model 2 (risk-protect. dimens.)			Model 3 (victimiz. and emot. dist.)		
	B	*SE(B)*	β	*B*	*SE(B)*	β	*B*	*SE(B)*	β
Gender	-,24	,15	-,09	-,22	,14	-,09	-,19	,13	-,08
Age	-,08	,030	**-,17****	-,08	,03	**-,16****	-,06	,03	**-,12***
Mother education	-,13	,07	-,11	-,09	,07	-,08	-,09	,06	-,09
Father education	,06	,07	,05	,09	,07	,08	,06	,06	,05
Family econ. well-being	-,14	,13	-,06	-,10	,13	-,05	-,15	,11	-,07
School success	-,18	,07	**-,15****	-,14	,08	-,11	-,16	,06	**-,14***
Family relations quality				-,01	,01	-,04	-,02	,01	**-,19***
Peer relations quality				-,03	,02	-,13	-,03	,01	**-,18***
School attainment				-,04	,02	-,17	-,02	,02	-,11
Peer pressure				,03	,02	,09	-,01	,02	-,01
Permissive parenting							-,02	,03	-,04
Parental control							-,01	,03	-,03
Emotional distress and reactiveness							-,01	,02	-,03
Cyber victimization							,13	,02	**,54*****
Talking about bullying to parents and friends							-,02	,03	-,06
R²	**,094**			**,151**			**,365**		
R Square Change	**,094**			**,056**			**,215**		
***F* for change in R^2**	**4,37*****			**4,11****			**16,42*****		

Note: p<,05*; p<,01**; p<,001***.
The values presented in bold were significant. The values marked with an * represent a t-test result significant at p<.05 level.

Table 6
Regression analysis for cyber victimization (N = 246).

Cyber victimization	Model 1 (soc.-econom. charact.)			Model 2 (risk-protect. dimens.)			Model 3 (perpetrat. and emot. dist.)		
	B	*SE(B)*	*β*	*B*	*SE(B)*	*β*	*B*	*SE(B)*	*β*
Gender	,25	,62	,03	,05	,60	,01	-,57	,41	-,06
Age	-,18	,12	-,09	-,14	,12	-,07	-,07	,08	-,03
Mother education	,04	,30	,01	,10	,29	,02	-,11	,20	-,02
Father education	,12	,29	,02	,23	,29	,05	,01	,20	,01
Family econ. well-being	,17	,54	,02	,30	,53	,03	,67	,36	,07
School success	-,07	,30	-,01	,20	,30	,04	,23	,21	,04
Family relations quality				-,09	,04	**-,23***	-,12	,03	**-,31*****
Peer relations quality				,09	,06	,12	,02	,04	,03
School attainment				-,09	,09	-,10	-,08	,06	-,08
Peer pressure				,29	,08	**,21****	,18	,060	**,13****
Permissive parenting							-,19	,09	**-,10***
Parental control							,32	,10	**,16****
Emotional distress and reactiveness							,46	,04	**,54*****
Talking about bullying to parents and friends							,18	,09	**,10***
Cyberbully perpetration							1,17	,17	**,29*****
R^2	**,011**			**,091**			**,654**		
R Square Change	**,011**			**,080**			**,563**		
***F* for change in R^2**	**,45**			**5,45*****			**79,13*****		

Note: p<,05*; p<,01**; p<,001***.
The values presented in bold were significant. The values marked with an * represent a t-test result significant at p<.05 level.

(2015). Studies focusing on the effects of cyberbullying have shown that students who were victims of cyberbullying had feelings of frustration, anger, anxiety and sadness because of their on-line victimization (Patchin and Hinduja, 2006; Ybarra et al., 2007). In addition, Cook et al. (2010) found that having poor social skills and low social competence is associated with being cyberbullied. These emotional responses are comparable to those found in research regarding traditional bullying (Cowie and Berdondini, 2002; Kowalski and Limber, 2007; as cited in Hobbs, 2009: 7). When analysing peer pressure, our research shows that peer pressure (β = ,21, p<,01) positively predicts cyber victimization. According to Pepler et al. (2004), peer factors influence victimization. For example, negative support from peers has been associated with cyberbullying, according to Williams and Guerra (2007). Furthermore, association with antisocial peers maximised the risk of antisocial behaviour as well as risk of violence, which leads to the conclusion that negative peer interactions can result in increased levels of cyberbullying (Hemphill et al., 2015). In fact, research has demonstrated that students who are targets for traditional bullying are also more likely to be victims of on-line harassment than non-victims (Ybarra et al., 2007). Finally, for cyber victimization, lower family life quality predicts cyber victimization (β = -,31, p<,001). Similarly, our results show that higher family relations quality negatively predicts cyberbullying perpetration (p<,05). The quality of relationships children and adolescents had, was the strongest predictor of bullying victimization in a study by Cook et al. (2010). For example, studies show that parental knowledge about their children's locations and discussions about online behaviour represent forms of parental control and monitoring, which results in lower frequencies of cyberbullying victimization (Wade and Beran, 2011). Our study results show that lower family relations quality indicates higher involvement in cyberbullying perpetration, even though some studies found that family risk and protective factors were not related to cyberbullying (Hemphill et al., 2015). A study by Hobbs (2009) indicated that being a cyberbully correlated negatively with global life satisfaction. In addition, being a traditional bully correlated negatively with family life satisfaction. Furthermore, cyberbullies and cyberbully-victims had lower family life and school experience satisfaction than cyber victims or students who were not involved in cyberbullying (Hobbs, 2009: 14). Surprisingly, our results show that parental control and style are not significant for cyberbullying perpetration nor cyber victimization, possibly due to our sample's higher age average. Research shows that as teens get older, they are less likely to have rules about their Internet use and less likely to follow what rules are established, as parent involvement appears to shift dramatically after age 13 (NCPC, 2007: 5). So, further longitudinal research is required to examine the importance of family factors in the prediction of cyberbullying victimization.

3.2. Implications for research and practice

The results of this study indicate that girls are more often cyberbullying victims – they talk to others and report cyberbullying more often, while boys and younger participants are more often cyberbullying perpetrators. Age and school success predict cyberbullying perpetration for younger and academically less efficient participants. Cyberbullying correlates negatively with the quality of traditional protective factors in risk behaviour aetiology – family, school and peer relations. Results show that younger male participants coming from less educated mothers, who have lower academic achievement and lower satisfaction with family life, peer relations and school attainment represent an average cyberbully profile. While the role of fathers remains inconclusive, lower educated mothers and lower family life quality predict cyber victimization, as well as cyberbullying perpetration, thus emphasising the preventive role of parents and the family, especially parenting control, which poses a risk factor. Our regression analysis explained around 36% of the analysed variance for cyberbullying perpetration, and 65% of the variance for cyber victimization. Noticeably, *cyberbullying perpetration* is best predicted by *cyber victimization*, while the range of emotional distress and reactiveness one demonstrates best predicts cyber victimization. On the one hand, exposure to cyber victimization relates to becoming a cyberbully. On the other, our results emphasise that the range of emotional control and responsiveness of an individual obviously triggers the gratifying outcomes cyberbullies seek in their activities. Still, other research found that bully/victims of cyber violence are much more likely to think that it is acceptable to retaliate after being cyberbullied than are non-victims (O'Brennan et al., 2009). Research suggests that bully-victims (children who bully others and are also victimized themselves) express a combination of poor emotion-regulation skills and aggressive-impulsive behaviour puts them at the highest risk for future maladjustment and involvement in violence (Schwartz et al., 2001). Still, the complex nature and motives of pure bullies and bully-victims needs further explanation, as shown in the research by Yang and Salmivalli (2013) or Rodkin and Berger (2008). Our results on the cyber victimization and cyberbullying perpetration among the adolescent population show a worrisome rising trend in comparison to prior research, making future studies on the complex aetiology and phenomenology of cyberbullying even more important.

3.3. Limitations

Several limitations of the current study should be noted. The research sample was small; therefore, conclusions of a larger scale and results generalization are out of the scope of this study. In addition, the extent of underreporting or over-reporting of behaviours cannot be determined, although the survey questions demonstrate good intercorrelational reliability. The parenting style scales were of limited scope, so future research should encompass standardised parenting style survey instruments. Bullying experiences, family and peer quality as well as school attainment measures were self-reported, but previous studies have shown these measures to be valid (Smith et al., 1995; Stanton et al., 1996). Because of cross-sectional data, the findings do not reveal whether *bully-victims* attack others because of retaliation (being targets themselves), or they become victims due to their own aggressive behaviour. Despite the limitations of not using standardised instruments, one strength of the study was the use of instruments with reliable psychometric properties to measure online perpetration/victimization, and social emotional outcomes. Since the development of psychometrically sound measures of cyberbullying has been limited, our scale shows promising reliability and validity for future research.

4. Conclusions

The results of this study indicate that there are distinct differences in the role of socioeconomic status in cyberbullying victimization and perpetration that mostly depend on gender, age, academic achievement and the mother's education level. Parenting control was important for victimization, as higher parental control positively predicted cyber victimization, but the role of parents needs further empirical evaluation. Our study results show cyberbullying and negative social emotional outcomes to be related constructs, with a distinct protective role of the quality of family, school and peer relations. Interestingly, emotional distress and reactiveness is strongly related to becoming a victim, which could imply that emotional control management in adolescents might have a protective role, as bullies often reach gratification through achieving visible emotional vulnerability and reactions in their victims. Future research should further explore the complex dynamics of the family, school and peer context in relation to cyber victimization and perpetration, but also encompass a distinction between the characteristics and motives of pure bullies and *bully-victims*, with the goal of developing effective prevention and intervention programs.

Declarations

Author contribution statement

Goran Livazović: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Emanuela Ham: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

Anderson, C.A., Bushman, B.J., 2002. Human aggression. Annu. Rev. Psychol. 53, 27–51.
Ang, R.P., Tan, K., Mansor, T.A., 2011. Normative beliefs about aggression as a mediator of narcissistic exploitativeness and cyberbullying. J. Interpers Violence 26, 2619–2634.
Aoyama, I., Utsumi, S., Hasegawa, M., 2012. Cyberbullying in Japan: cases, government reports, adolescent relational aggression, and parental monitoring roles. In: Li, Q., Cross, D., Smith, P.K. (Eds.), Cyberbullying in the Global Playground: Research from International Perspectives. Blackwell, Malden, MA, pp. 183–201.
Belsey, B., 2004. Cyberbullying.ca (goo.gl/S3CK4f) (2017, June 11).
Beran, T., Li, Q., 2007. The relationship between cyberbullying and school bullying. J. Stud. Wellbeing 1 (2), 15–33.
Brown, C.F., Demaray, M.K., Secord, S.M., 2014. Cyber victimization in middle school and relations to social emotional outcomes. Comput. Hum. Behav. 35, 12–21.
Calmaestra-Villen, J., 2011. Cyberbullying: Prevalence and Characteristics of a New Type of Indirect Bullying. Available from Dissertation Abstracts International.
Calvete, E., Orue, I., Estévez, A., Villardón, L., Padilla, P., 2010. Cyberbullying in adolescents: modalities and aggressors' profile. Comput. Hum. Behav. 26, 1128–1135.
Cappadocia, M.C., 2009. Cyberbullying and Cybervictimization: Prevalence, Stability, Risk and Protective Factors, and Psychosocial Problems (Master's thesis). Available from ProQuest Dissertations and Theses.
Cook, C.R., Williams, K.R., Guerra, N.G., Kim, T.E., Sadek, S., 2010. Predictors of bullying and victimization in childhood and adolescence: a meta-analytic investigation. Sch. Psychol. Q. 25, 65–83.
Cowie, H., Berdondini, L., 2002 Nov. The expression of emotion in response to bullying. Emot. Behav. Difficulties 7 (4), 204–214.
Cross, D., Lester, L., Barnes, A., 2015. A longitudinal study of the social and emotional predictors and consequences of cyber and traditional bullying victimization. Int. J. Public Health 60 (2), 207–217.
Currie, D., Zanotti, C., Morgan, A., Looze, M.D., Roberts, C., Samdal, O.,, et al., 2012. Social Determinants of Health and Wellbeing Among Young People. World Health Organization Regional Office for Europe.
Diener, E., 1980. The Psychology of Group Influence. Erlbaum, New York, NY.
Dilmac, B., 2009. Psychological needs as a predictor of cyber bullying: a preliminary report on college students. Educ. Sci. Theor. Pract. 9, 1307–1325.
Dilmac, J.A., 2014. Humiliation in the virtual world: definitions and conceptualization. Int. J. Hum. Sci. 11 (2), 1285–1296.
Due, P., Merlo, J., Harel-Fisch, Y., Damsgaard, M.T., Holstein, B.E., et al., 2009. Socioeconomic inequality in exposure to bullying during adolescence: a comparative, cross-sectional, multilevel study in 35 countries. Am. J. Public Health 99 (5), 907–914.
Đuraković, S.J., Šincek, D., Tomašić Humer, J., 2014. Prikaz skale doživljavanja/činjenja nasilja preko interneta i rezultata primjene skale na vinkovačkim srednjoškolcima. Život i škola 32 (2), 61–74.
Ericson, N., 2001. Addressing the problem of juvenile bullying. Office of Juvenile Justice and Delinquency Prevention. U.S. Department of Justice.
Ethical Code of Research with Children, 2003. The Council for Children of the Government of the Republic of Croatia. The Institute for Family, Motherhood and Youth Protection, Zagreb (goo.gl/XoJ73H).
Fanti, K.A., Demetriou, A.G., Hawa, V.V., 2012. A longitudinal study of cyberbullying: examining risk and protective factors. Eur. J. Dev. Psychol. 9, 168–181.
Faucher, C., Jackson, M., Cassidy, W., 2014. Cyberbullying among university students: gendered experiences, impacts and perspectives. Educ. Res. Int. 2014, 1–10.
Fleming, L.C., Jacobsen, K.H., 2010. Bullying among middle-school students in low and middle income countries. Health Promot. Int. 25 (1), 73–84.
Gradinger, P., Strohmeier, D., Spiel, C., 2012. Motives for bullying others in cyberspace: a study on bullies and bully-victims in Austria. In: Li, Q., Cross, D., Smith, P.K. (Eds.), Cyberbullying in the Global Playground: Research from International Perspectives. Blackwell, Malden, MA, pp. 263–284.
Gullone, E., Robertson, N., 2008. The relationship between bullying and animal abuse behaviors in adolescents: the importance of witnessing animal abuse. J. Appl. Dev. Psychol. 29, 371–379.
Guo, S., 2016. A meta-analysis of the predictors of cyberbullying perpetration and victimization. Psychol. Sch. 53 (4), 432–453.
Hemphill, S.A., Tollit, M., Kotevski, A., Heerde, J.A., 2015. Predictors of traditional and cyber-bullying victimization: a longitudinal study of Australian secondary school students. J. Interpers Violence 30 (15), 2567–2590.
Hinduja, S., Patchin, J.W., 2008. Cyberbullying: an exploratory analysis of factors related to offending and victimization. Deviant Behav. 29 (2), 129–156.
Hinduja, S., Patchin, J., 2013. Social influences on cyberbullying behaviors among middle and high school students. J. Youth Adolesc. 42, 711–722.
Hinduja, S., Patchin, J.W., 2014. Cyberbullying identification, prevention, and response. Cyberbullying Research Center (goo.gl/CAVY9J).
Hobbs, M.E., 2009. E-bullies: the Detrimental Effects of Cyberbullying on Students' Life Satisfaction. Miami University (goo.gl/vMjbwi).
Holfeld, B., Grabe, M., 2012. An examination of the history, prevalence, characteristics, and reporting of cyberbullying in the United States. In: Li, Q., Cross, D., Smith, P.K. (Eds.), Cyberbullying in the Global Playground: Research from International Perspectives. Blackwell, Malden, MA, pp. 117–142.
Hunt, C., Peters, L., Rapee, R.M., 2012. Development of a measure of the experience of being bullied in youth. Psychol. Assess. 24, 156–165.
Katzer, C., Fetchenhauer, D., Belschak, F., 2009. Cyberbullying: who are the victims? A comparison of victimization in Internet chatrooms and victimization in school. J. Media Psychol. 21, 25–36.

Kowalski, R.M., Limber, S.P., 2007. Electronic bullying among middle school students. J. Adolesc. Health 41, 22–30.
Kowalski, R.M., Giumetti, G.W., Schroeder, A.N., Reese, H., 2012a. Cyberbullying among college students: evidence from multiple domains of college life. In: Wankel, C., Wankel, L. (Eds.), Misbehavior Online in Higher Education. Emerald, Bingley, United Kingdom, pp. 293–321.
Kowalski, R.M., Limber, S.E., Agatston, P.W., 2012b. Cyberbullying: Bullying in the Digital Age, second ed. Wiley-Blackwell, Malden, MA.
Kowalski, R.M., Morgan, C.A., Limber, S.E., 2012c. Traditional bullying as a potential warning sign of cyberbullying. Sch. Psychol. Int. 33, 505–519.
Kowalski, R.M., Giumetti, G.W., Schroeder, A.N., Lattanner, M.R., 2014. Bullying in the digital age: a critical review and meta-analysis of cyberbullying research among youth. Psychol. Bull. 140, 1073–1137.
Lenhart, A., 2010, May 6. Cyberbullying: what the Research Is Telling Us. Retrieved from. http://www.pewInternet.org/Presentations/2010/May/Cyberbullying-2010.aspx.
Li, Tanya, Beran, Qing, Apr 2005. Cyber-harassment: A study of a new method for an old behavior. J. Educ. Comput. Res. 32 (3), 265–277.
Li, Q., 2006. Cyberbullying in schools: a research of gender differences. Sch. Psychol. Int. 27 (2), 157–170.
Loeber, R., Disheon, T.J., 1984. Early predictors of male delinquency: A review. Psychol. Bull. 94, 68–99.
Magnusson, D., Stattin, H., Dunér, A., 1983. Aggression and criminality in a longitudinal perspective. vol. 2. In: Van Dusen, K.T., Mednick, S.A. (Eds.), Prospective studies of crime and delinquency. longitudinal research in the behavioral, social and medical sciences (An International Series). Springer, Dordrecht.
Mahady Wilton, M.M., Craig, W.M., Pepler, D.J., 2001. Emotional regulation and display in classroom victims of bullying: characteristic expressions of affect, coping styles and relevant contextual factors. Soc. Dev. 9, 226–245.
Maitra, P., 2003. Schooling and educational attainment: evidence from Bangladesh. Educ. Econ. 11 (2), 129–153.
Makri-Botsari, E., Karagianni, G., 2013. Cyberbullying in Greek adolescents: the role of parents. Proc. Soc. Behav. Sci. 116, 3241–3253.
Mitchell, K.J., Ybarra, M., Finkelhor, D., 2007. The relative importance of online victimization in understanding depression, delinquency, and substance use. Child. Maltreat. 12, 314–324.
National Crime Prevention Council (NCPC), 2007. Teens and Cyberbullying, Executive Summary of a Report on Research. Harris Interactive (goo.gl/7Gbl8w).
Olweus, D., Limber, S., Mihalic, S., 1999. Bullying prevention program. Boulder : Center for the Study and Prevention of Violence.
Olweus, D., Limber, S.P., 2010, November. What do we know about bullying: information from the Olweus Bullying Questionnaire. In: Paper Presented at the Meeting of the International Bullying Prevention Association, Seattle, WA.
O'Brennan, L.M., Bradshaw, C.P., Sawyer, A.L., 2009. Examining developmental differences in the social-emotional problems among frequent bullies, victims, and bully/victims. Psychol. Sch. 46, 100–115.
Patchin, J.W., Hinduja, S., 2006. Bullies move beyond the schoolyard: a preliminary look at cyberbullying. Youth Violence Juv. Justice 4 (2), 148–169.
Patchin, J.W., Hinduja, S., 2012. Cyberbullying Prevention and Response: Expert Perspectives. Routledge, New York.
Pepler, D., Smith, P.K., Rigby, K., 2004. Bullying in Schools: How Successful Can Interventions Be? Cambridge University Press, Cambridge, UK.
Pontzer, D., 2010. A theoretical test of bullying behavior: parenting, personality, and the bully/victim relationship. J. Fam. Violence 25, 259–273.
Postmes, T., Spears, R., 1998. Deindividuation and antinormative behavior: a meta-analysis. Psychol. Bull. 123, 238–259.
Raskauskas, J., Stoltz, A.D., 2007. Involvement in traditional and electronic bullying among adolescents. Dev. Psychol. 43 (3), 564–575.
Rigby, K., 2003 Oct. Consequences of bullying in schools. Can J Psychiatry 48 (9), 583–590.
Robson, C., Witenberg, R.T., 2013. The influence of moral disengagement, morally based self-esteem, age, and gender on traditional bullying and cyberbullying. J. Sch. Violence 12 (2), 211–231.
Rodkin, P.C., Berger, C., 2008. Who bullies whom? Social status asymmetries by victim gender. Int. J. Behav. Dev. 32, 473–485.
Schultze-Krumbholz, A., Scheithauer, H., 2009. Social-behavioral correlates of cyberbullying in a German student sample. Z. für Psychol./J. Psychol., 217, 224–226.
Schwartz, D., Proctor, L., Chien, D., 2001. The aggressive victim of bullying: emotional and behavioral dysregulation as a pathway to victimization by peers. In: Juvonen, J., Graham, S. (Eds.), School-based Peer Harassment: the Plight of the Vulnerable and Victimized. Guilford Press, Boston, MA, pp. 147–174.
Slonje, R., Smith, P.K., 2008. Cyberbullying: another main type of bullying? Scand. J. Psychol. 49, 147–154.
Smith, G.T., McCarthy, D.M., Goldman, M.S., 1995. Self-reported drinking and alcohol-related problems among early adolescents: dimensionality and validity over 24 months. J. Stud. Alcohol Drugs 56 (4), 383–394.
Smith, P.K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., Tippett, N., 2008. Cyberbullying: its nature and impact in secondary school pupils. J. Child Psychol. Psychiatry 49, 376–385.
Sourander, A., Klomek, A.B., Ikonen, M., Lindroos, J., Luntamo, T., Koskelainen, M., et al., 2010. Psychosocial risk factors associated with cyberbullying among adolescents. Arch. Gen. Psychiatr. 67, 720–728.
Stanton, W.R., McClelland, M., Elwood, C., Ferry, D., Silva, P.A., 1996. Prevalence, reliability and bias of adolescents' reports of smoking and quitting. Addiction 91 (11), 1705–1714.
Steffgen, G., König, A., Pfetsch, J., Melzer, A., 2011. Are cyberbullies less empathic? Adolescents' cyberbullying behavior and empathic responsiveness. Cyberpsychol. Behav. Soc. Netw. 14, 643–648.
Swearer, S.M., Espelage, D.L., Vaillancourt, T., Hymel, S., 2010. What can be done about school bullying? Linking research to educational practice. Educ. Res. 39, 38–47.
Taiariol, J., 2010. Cyberbullying: the Role of Family and School (Doctoral dissertation). Available from Dissertation Abstracts International.
Tattum, D.P., 1989. Violence and aggression in schools. In: Tattum, D.P., Lane, D.A. (Eds.), Bullying in schools, pp. 7–19. Stroke-on-Trent, Great Britain: Trentham.
Tomsa, R., Jenaro, C., Campbell, M., Neacsua, D., 2013. Student's experiences with traditional bullying and cyberbullying: findings from a Romanian sample. Proc. Soc. Behav. Sci. 78, 586–590.
Troop-Gordon, W., 2017. Peer victimization in adolescence: the nature, progression, and consequences of being bullied within a developmental context. J. Adolesc. 55, 116–128.
Ubertini, M., 2011. Cyberbullying May Reduce Adolescent's Well-Being: Can Life Satisfaction and Social Support Protect Them? (Doctoral dissertation). Available from Dissertation Abstracts International.
Vannucci, M., Nocentini, A., Mazzoni, G., Menesini, E., 2012. Recalling unpresented hostile words: false memories predictors of traditional and cyberbullying. Eur. J. Dev. Psychol. 9, 182–194.
Vazsonyi, A.T., Machackova, H., Sevcikova, A., Smahel, D., Cerna, A., 2012. Cyberbullying in context: direct and indirect effects by low self-control across 25 European countries. Eur. J. Dev. Psychol. 9, 210–227.
Wade, A., Beran, T., 2011. Cyberbullying: the new era of bullying. Can. J. Sch. Psychol. 26, 44–61.
Walrave, M., Heirman, W., 2011. Cyberbullying: predicting victimisation and perpetration. Child. Soc. 25, 59–72.
Wang, J., Iannotti, R.J., Nansel, T.R., 2009. School bullying among adolescents in the United States: physical, verbal, relational, and cyber. J. Adolesc. Health 45, 368–375.
Willard, N.E., 2007. Cyberbullying and Cyberthreats: Responding to the challenge of Online Social Aggression, Threats, and Distress. Research Press, Champaign, IL.
Williams, K.R., Guerra, N.G., 2007. Prevalence and predictors of internet bullying. J. Adolesc. Health 41, 14–21.
Wilson, M., Dunlavy, A., Berchtold, A., 2013. Determinants for bullying victimizationamong 11–16-year-olds in 15 low- and middle-income countries: a multi-level study. Soc. Sci. 2 (4), 208–220.
Yang, A., Salmivalli, C., 2013. Different forms of bullying and victimization: bully-victims versus bullies and victims. Eur. J. Dev. Psychol.
Yang, S.-J., Stewart, R., Kim, J.-M., Kim, S.-W., Shin, I.-S., Dewey, M.E., Maskey, S., Yoon, J.-S., 2013. Differences in predictors of traditional and cyber-bullying: a 2-year longitudinal study in Korean schoolchildren. Eur. Child Adolesc. Psychiatry 22, 309–318.
Ybarra, M.L., Mitchell, K.J., 2004. Online aggressor/targets, aggressors and targets: a comparison of associated youth characteristics. J. Child Psychol. Psychiatry 45, 1308–1316.
Ybarra, M.L., Mitchell, K.J., 2004a. Online aggressor/targets, aggressors, and targets: a comparison of associated youth characteristics. J. Child Psychol. Psychiatry 45, 1308–1316.
Ybarra, M.L., Mitchell, K.J., 2004b. Youth engaging in online harassment: associations with caregiver– child relationships, Internet use, and personal characteristics. J. Adolesc. 27, 319–336.
Ybarra, M., Diener-West, M., Leaf, P., 2007. Examining the overlap in internet harassment and school bullying: implications for school intervention. J. Adolesc. Health 41, 42–50.
Zalaquett, C.P., Chatters, S.J., 2014. Cyberbullying in college: frequency, characteristics, and practical implications. SAGE Open 4 (1), 1–8.