Adolescent predictors of young adult cyberbullying perpetration and victimization among Australian youth

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Abstract

Purpose—The purpose of the current paper was to examine the adolescent risk and protective factors (at the individual, peer group, and family level) for young adult cyber-bullying perpetration and victimization.

Methods—Data from 2006 (Grade 9) to 2010 (young adulthood) were analyzed from a community sample of 927 Victorian students originally recruited as a state-wide representative sample in Grade 5 (age 10–11 years) in 2002 and followed up to age 18–19 years in 2010 ($N =$ 809). Participants completed a self-report survey on adolescent risk and protective factors and traditional and cyber-bullying perpetration and victimization, and young adult cyber-bullying perpetration and victimization.

Results—As young adults, 5.1% self-reported cyber-bullying perpetration only, 5.0% cyber-bullying victimization only, and 9.5% reported both cyber-bullying perpetration and victimization. In fully adjusted logistic regression analyses, the adolescent predictors of cyber-bullying perpetration only were traditional bullying perpetration, traditional bullying perpetration and victimization, and poor family management. For young adulthood cyber-bullying victimization only, the adolescent predictor was emotion control. The adolescent predictors for young adult cyber-bullying perpetration and victimization were traditional bullying perpetration and cyber-bullying perpetration and victimization.

Conclusions—Based on the results of this study, possible targets for prevention and early intervention are reducing adolescent involvement in (traditional or cyber-) bullying through the development of social skills and conflict resolution skills. In addition, another important prevention target is to support families with adolescents to ensure they set clear rules and monitor

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adolescent's behavior. Universal programs that assist adolescents to develop skills in emotion control are warranted.

Keywords

cyber-bullying; predictors; longitudinal study; young adults

Introduction

The existing research literature on bullying is vast and research on cyber-bullying is rapidly growing, reflective of global concern about these phenomena. The main focus of bullying research has been on school contexts, until the emergence of cyber-bullying. Remarkably less research has focused on (young) adult experiences of bullying. However, there is recognition that adults can be exposed to bullying in the workplace and in tertiary education. Hence, it is important to understand the extent of cyber-bullying perpetration and victimization in young adults. MacDonald and Roberts-Pittman (1) reported in a United States (US) college sample that 22% of students had been cyber-bullied and 9% had cyber-bullied someone else. Also in the US, Kowalski et al. (2) reported that 21% of their participants had been cyber-bullied once or more in their lifetime, with 4% cyber-bullied 11–20 times. Walker et al (3) found that 11% of their sample had experienced cyber-bullying at the University and 54% know someone who had been cyber-bullied. Compared with matched control participants, college students who experienced cyber-bullying reported negative impacts, such as depression, anxiety, and higher levels of distress, as well as suicidal ideation, planning, and attempts (4). The aim of the current paper is to examine the adolescent predictors of young adult cyber-bullying perpetration and victimization. Through identifying predictors of later cyber-bullying perpetration and victimization, prevention and early intervention programs can be developed to target these predictors.

Typically, three main features of school-based or "traditional" bullying are identified: 1) aggressive or hostile acts perpetrated by one or more individuals toward a victim with intent to harm; 2) these actions occur repeatedly; and 3) there is a power imbalance between the perpetrator(s) and the victim(s) (5). This power imbalance may be physical (e.g., the perpetrator is stronger than the victim) or sociological (e.g., the victim belongs to an ethnic minority group). Bullying can be covert (e.g., exclusion, spreading rumours) or overt (e.g., verbal and physical abuse). The measurement of bullying can be challenging, particularly when trying to capture power imbalances, and the criterion of repetition is often overlooked (6).

Given cyber-bullying is a recent phenomenon there is still debate about how it is defined. For example, Menesini et al. (7) concluded that intentionality and power imbalance were essential features of cyber-bullying; however, it is unclear at this stage whether repetition is a core feature of cyber-bullying. Cyber-bullying has also been described as an extension of "traditional" bullying, with similar defining features except that electronic media such as computers, tablets, and mobile telephones are used by young people to bully, embarrass, exclude or humiliate others, via methods such as email, chat-rooms, social networking sites, instant messaging, websites, telephone calls, video and text messaging (8). Cyber-bullying

can be overt (e.g., deliberate cyber-stalking, sending derogatory or hate mail, being abusive towards others using technology; (9)) or covert (e.g., being removed from social network sites). In the current paper, we measured cyber-bullying perpetration and victimization using examples of behaviors; an approach that is similar to that used elsewhere (10).

Predictors of cyber-bullying perpetration and victimization

In the current paper, the predictors of young adult cyber-bullying perpetration and victimization are referred to as prospective "risk" or "protective" factors. A risk factor increases the likelihood of a person developing poor outcomes or problematic behaviors such as bullying (11). Protective factors both directly decrease the likelihood of antisocial behaviour (12) and mediate or moderate the influence of risk factors (13). Bronfenbrenner's (14) ecological systems theory emphasizes the influence of environmental factors on development, with the identification of five environmental systems with which the individual interacts. The system most proximal to the individual, the microsystem, includes the groups that most directly impact on development such as family and peers. In addition to intrapersonal factors, the modifiable risk and protective factors selected for inclusion in this paper were drawn from the microsystem.

Relatively few studies have focused specifically on young adult experiences of cyber-bullying perpetration and victimization and there are even fewer on the predictors of cyber-bullying. Therefore, the literature on adolescent experiences of bullying and cyber-bullying has also been reviewed. Generally, there have been few studies comparing the predictors of school-based and cyber-bullying. However, Katzer et al. (15) reported similarities (e.g., negative self-concept, characteristics of the parent-child relationship) and differences in the predictors of internet chatroom victimization and vicitimization at school (e.g., popularity, bullying behaviour). For intrapersonal factors, the frequency of online communication has been shown to predict cyber-bullying others (16). Prior exposure to bullying and related behavior predicts subsequent bullying perpetration. Chapell et al. (17) found that more than 70% of students who were bullied in elementary school and high school bullied others at university. Similarly, an Australian study showed that Grade 9 cyber-bullying perpetration was predicted by Grade 7 relational aggression (e.g., spreading rumors about someone, excluding another person from the group) (18) and other studies of school students have reported that antisocial behaviour (traditional bullying, rule-breaking) predicts cyber-bullying perpetration (16). Associations have also been found between being a perpetrator of cyber-bullying and being a victim of the same behavior (2). Gender has been examined as a predictor of cyber-bullying with mixed results reported in terms of whether females are more likely to be victims (19–22).

Several intrapersonal factors related to school have been studied. Being connected to school is associated with a lower risk of involvement in bullying perpetration (21). There is also an association between low academic performance and school-based bullying perpetration (23). In contrast, there have been mixed research findings regarding whether or not there is a link between academic performance and being bullied (24). Some studies have shown that having poor social skills and low social competence are associated with being bullied, particularly when students also experience low self-regard (25, 26). In the current study, a

measure of students' emotion control is included (e.g., controlling one's temper when someone is angry at him/her) which assesses some aspects of social competence.

As recognised in Bronfenbrenner's theory (14), family risk factors influence young people's development. High levels of parental support are related to young people experiencing less bullying (physical, verbal, relational, and cyber) (27). Having a poor emotional bond with a caregiver increases the likelihood of being involved in online bullying perpetration (28). Family conflict is an established predictor of youth violence, physical aggression, and bullying perpetration (29). Further, children residing in home environments characterised by violence and marital conflict (30, 31) and maltreated children (32) are more likely to be bullied by their peers at school. Poor family management (reflected by lack of clear rules and monitoring of students) is also an established risk factor for violent and antisocial behaviors (29) and is likely to be predictive since cyber-bullying can occur anytime, anywhere, including in the family home; parent monitoring and rule-setting may be key. Research has demonstrated that family members can exacerbate, interfere with, or discourage cyber-bullying (9).

Peers are another important social context during adolescence. A well-established finding is that antisocial peer influences increase the risk of violence and antisocial behavior (29). Online peers can easily become bystanders for cyber-bullying, and similar to the offline world, the negative peer interactions can result in increased levels of cyber-bullying through the development of a group culture that rewards bullying, for example posts on Instagram (33).

The present study

The current study aims to investigate the adolescent risk and protective factors that predict young adult cyber-bullying perpetration and victimization. Consistent with previous research findings, it is hypothesized that prior participation in traditional and/or cyber-bullying will predict young adult cyber-bullying perpetration and victimization. It is also expected that there will be variation in the specific predictors of cyber-bullying perpetration and victimization, with family risk factors and association with antisocial peers predictive of young adult cyber-bullying perpetration but not victimization.

Methods

Participants

The sample for this study comprised Victorian students from the International Youth Development Study (IYDS), a longitudinal study of antisocial and prosocial behaviours among adolescents in Victoria, Australia and Washington State, US. The original sampling and recruitment for the IYDS has been described elsewhere (34). Briefly, the IYDS used a two-stage cluster sampling approach: 1) random selection of public and private schools stratified according to geographic location, using a probability proportionate to grade-level size sample procedure; and 2) one class at each grade level (Grade 5, 7, and 9) within each school was selected at random. This paper reports on the Victorian sample comprised of 927 (481 female, 446 male) students who were first surveyed in 2002 when they were 10–11

years old. These students have been reassessed annually from 2002 to 2010. Other IYDS cohorts have not been surveyed as frequently due to funding constraints and are therefore excluded from these analyses. Data analysed in this paper are from 2006 when participants (390 males, 414 females) were aged 14–15 years (M = 15.2, SD = 0.4) and 2010 (365 males, 444 females) when the mean age of the sample was 19.0 years (*SD* = 0.4).

Measures

The self-reported measures of Grade 9 risk and protective factors and young adult cyber-bullying perpetration and victimisation are contained within a modified version of the *Communities that Care* survey, used in the IYDS. The survey has acceptable psychometric properties in the US (35) and has been used in Victoria (36). The risk and protective factors assessed in Grade 9 spanned intrapersonal, peer group, and family factors. These measures and the Grade 9 measures of bullying victimization and perpetration are described in Table 1.

Cyber-bullying perpetration and victimization in young adulthood—*Cyber-bullying perpetration* in young adulthood was measured by asking participants how many times in the past 12 months they did the following things to others through the use of technology: made rude comments or mean comments to anyone; spread rumours about someone, whether they were true or not; and made aggressive or threatening comments to anyone. *Cyber-bullying victimization* was measured the same way only the item asked participants if the above listed behaviours had happened to them. Response options for each set of items were *No*; *Yes, but not in the past year*; *Yes, once in the past year*; and *Yes, more than once in the past year*. Response options were recoded to give participants a score of 0 if they answered *No* or *Yes, but not in the past year*, or *Yes, once in the past year* and a score of 1 if participants reported cyber-bullying perpetration/victimization *more than once in the past year* (i.e., repeated cyber-bullying perpetration or victimization). This coding is consistent with definitions used in the research literature that still emphasize repetition. Through this coding, a distinction was made between participants who only perpetrated cyber-bullying, participants who were victims of cyber-bullying, and participants who were both perpetrators and victims.

Procedure

Ethics approval was obtained from The University of Melbourne Human Ethics in Research Committee. In Grade 9 (age 14–15 years), approval was also sought from relevant educational authorities and permission to administer the 2006 survey was obtained from each school principal. The Grade 9 survey was group administered within the students' classrooms, and required approximately 50–60 minutes to complete. Students no longer attending school in Grade 9, or who were absent on the day of the survey, were surveyed individually by trained personnel. Both parental written informed consent and student assent was obtained for each participant. In 2010, participants provided informed consent before individually completing the survey online, on the telephone or by posting a paper-and-pencil version of the survey. In 2006 and 2010, participants received a gift voucher after completing the survey.

Analyses

Data analysis was performed with the Stata/IC 12.0 for Windows program (37) for all participants with complete data on all variables analyzed. First, attrition analyses were conducted comparing scores on all of the Grade 9 variables for participants whose data was analysed and those without data in young adulthood. Next, descriptive statistics were calculated for all variables analyzed in this paper. Third, chi-square analyses compared rates of cyber-bullying perpetration and victimization in young adulthood for the entire sample and males and females separately. Fourth, correlations between all of the risk and protective factors and outcomes included in the analyses were calculated. Given that the maximum correlation was .48 (well below the recommended .80), bivariate associations did not indicate problems with multi-collinearity (38). All multinomial logistic regression analyses controlled for age, gender and the clustering of students in schools. First, a series of separate unadjusted multinomial logistic regression analyses were performed to examine the associations between each Grade 9 risk/protective factor and each of the three cyber-bullying groups in young adulthood; perpetration only, victimization only, and combined perpetration and victimization. Second, fully adjusted multinomial logistic regression analyses were conducted to compare each of the three groups regarding the relative importance of the risk/protective factors included in this paper.

Results

Sample characteristics

In Grade 9, 809 (87.3%) completed the survey with another 60 (6.5%) contacted and 58 (6.3%) lost to follow-up. In young adulthood, 804 (86.7%) completed the survey with a further 73 (7.90%) contacted and 50 (5.4%) lost to follow-up. Attrition analyses revealed that students who no longer remained in the study in 2010 reported higher scores on academic failure, low school commitment, and association with antisocial peers than students remaining in the study in 2010. In general, the results in Table 1 showed that adolescents in the cyber-bullying perpetration and combined cyber-bullying perpetration and victimization groups had worse scores than other groups.

Rates of young adult cyber-bullying perpetration and victimization

Over one in eleven young adult participants reported that they had experienced both cyber-bullying perpetration and victimization, with one in twenty reporting that they had perpetrated only or been victims only of cyber-bullying (see Table 2). More males than females were in the combined perpetration and victimization group.

Unadjusted multinomial logistic regression analyses

Results of the unadjusted multinomial logistic regression analyses (see Table 3) showed that the adolescent risk and protective factors of cyber-bullying perpetration only and the combined cyber-bullying perpetration and victimization group were similar; being male, traditional bullying perpetration only, traditional bullying perpetration and victimization, academic failure, association with antisocial friends, poor family management, and family conflict were common predictors to these two outcomes. Attachment to mother was a

protective factor for cyber-bullying perpetration. The predictors of cyber-bullying victimization were traditional bullying victimization, cyberbullying perpetration, traditional bullying perpetration and victimization, emotion control, and association with antisocial friends. Other predictors for cyber-bullying perpetration and victimization were cyber-bullying perpetration and victimization and low commitment to school.

Fully adjusted multinomial logistic regression analyses

Table 4 presents the results of the fully adjusted multinomial logistic regression analyses. The predictors of young adult cyber-bullying perpetration were Grade 9 traditional bullying perpetration, traditional bullying perpetration and victimization, and poor family management. For cyber-bullying victimization, one predictor remained statistically significant, Grade 9 emotion control. The predictors of the cyber-bullying perpetration and victimization group were Grade 9 traditional bullying perpetration and combined cyber-bullying perpetration and victimization. Being male and low school commitment seemed to be affected by a suppressor variable because the direction of the association changed in the unadjusted and fully adjusted analyses. Therefore, these results are not interpreted.

Discussion

The current study examined the adolescent predictors (age 14 to 15 years) of young adult (age 18–19 years) cyber-bullying perpetration and victimization. Results showed that the predictors of cyber-bullying perpetration in young adulthood were Grade 9 traditional bullying perpetration, traditional bullying perpetration and victimization, and poor family management. For cyber-bullying victimization, one adolescent predictor was found, emotion control. The predictors of the cyber-bullying perpetration and victimization group were Grade 9 traditional bullying perpetration and Grade 9 cyber-bullying perpetration and victimization. More young adult males than females were in the combined cyber-bullying perpetrator and victim group. The rates of cyber-bullying perpetration and victimization in this paper may be underestimated since the criterion used here required repetition of cyber-bullying in the past year. Depending on developments with the definitions of cyber-bullying, a less stringent criterion may be appropriate.

The current study's findings demonstrated the influence of intrapersonal characteristics such as prior behaviour and emotion control. Grade 9 traditional bullying perpetration was predictive of cyber-bullying perpetration and combined perpetration and victimization, consistent with the findings of other studies (e.g.,(17)) that have shown continuity in bullying perpetration over time and other research on violent behavior also demonstrating that previous behavior is a strong predictor of later behavior (39). In accordance with studies demonstrating that having poor social skills and low social competence are associated with being bullied (25, 26), emotion control (e.g., the ability to control one's own temper when another is angry) protected against being a victim of cyber-bullying. These findings underline the importance of intervening early in the pathway to teach young people social skills and conflict resolution skills when behaviors emerge to prevent continuation into the future.

In relation to the microsystem in which the young person lives (14), support was found for the role of family environment for cyber-bullying perpetration. Poor family management was predictive of cyber-bullying perpetration consistent with studies of violent and antisocial behaviors (29). These results demonstrate that parenting received during adolescence can influence behavior approximately four years later and supports the importance of setting clear rules and monitoring adolescent behavior to establish appropriate behavior. Contrary to previous research (29–32), family conflict was not a predictor in this study. It is possible that family conflict may impact behavior at a point in time that is closer to the occurrence of family conflict rather than four years later (40).

The findings of this study in relation to gender, specifically that more young adult males than females were both cyber-bullying perpetrators and victims, are consistent with studies of traditional bullying with similar results (21, 27) and some studies suggesting higher rates of cyber-bullying perpetration for males (20, 21).

Strengths and limitations

This study has a number of strengths. It draws on a rich data set collected as part of an ongoing longitudinal study of young people's development. It therefore provides a rare opportunity to examine the adolescent (age 14–15) risk and protective factors that predict young adult cyber-bullying perpetration and victimization, using a sample originally recruited to be representative of the state of Victoria. The study also measures a range of risk and protective factors that span the individual, family, and peer group to examine the multiple factors that can influence cyber-bullying perpetration and victimization. In addition, the predictors across the three groups – cyber-bullying perpetration only, cyber-bullying victimization only, and combined cyber-bullying perpetration and victimization – were compared.

The main limitation of this study is that it analyzes self-report data and therefore relies on participant honesty when completing the survey. Another limitation is that the measure of young adult cyber-bullying included three items. Studies like this one need to be replicated using more sophisticated measures of cyber-bullying. Due to small numbers of participants in some cells, it was not possible to investigate potential moderating effects of gender; studies including larger samples sizes are needed to conduct these analyses. To more closely examine the role of peers in cyber-bullying, studies utilizing social network analyses are warranted. This study did not include adolescent measures of the frequency of online communication and family socioeconomic status; these are variables that should be included in future studies. The results presented here need to be interpreted acknowledging that attrition analyses showed the participants without data in 2010 scored higher on academic failure, low school commitment, and association with peers in Grade 9.

Implications for practice and policy

The rates of cyber-bullying perpetration and victimization reported here are high enough to warrant prevention and early intervention approaches for this age group. For combined cyber-bullying perpetration and victimization in young adulthood, males reported higher rates than females. This may reflect young adult males' greater use and sophistication with

technology and the need to directly target males with cyber-bullying prevention programs tailored to be relevant to them. For cyber-bullying perpetration during young adulthood, addressing earlier engagement in traditional bullying perpetration in Grade 9 and cyber-bullying perpetration and victimization is important since past behavior was a strong predictor of future behaviour; effective programs implemented in the school years may reduce engagement in cyber-bullying in young adulthood. In addition, educating families in how to provide appropriate monitoring and clear rules for school students may prevent perpetration of young adult cyber-bullying. Assisting students to learn skills in emotion control (keeping their emotions in check in stressful situations) may reduce vulnerability to cyber-bullying victimization.

Conclusions

This longitudinal study of the adolescent predictors of young adult cyber-bullying perpetration and victimization showed that rates of cyber-bullying experiences were as high as 19% and there were similarities and differences in predictors for participants who engaged in cyber-bullying perpetration only, cyber-bullying victimization only, or both cyber-bullying perpetration and victimization. Prevention and early intervention programs are needed that assist students to develop social, emotion control, and conflict resolution skills to reduce the likelihood that they will engage in or experience (cyber-) bullying. Given that poor family management was a predictor, families of adolescents need assistance with setting clear rules and monitoring their child's behavior to prevent later cyber-bullying perpetration.

Acknowledgements

Abbreviations

IYDS   International Youth Development Study

References

1. MacDonald CD, Roberts-Pittman B. Cyberbullying among college students: Prevalence and demographic differences. Procedia Soc Behav Sci. 2010; 9:2003–2009.

2. Kowalski, RM.; Giumetti, GW.; Schroeder, AN., et al. Chapter 14: Cyber bullying among college students: Evidence from multiple domains of college life. In: Wankel, LA.; Wankel, C., editors. Misbehavior online in higher education (cutting-edge technologies in higher education, volume 5). Emerald Group Publishing Limited; 2012. p. 293-321.

3. Walker CM, Sockman BR, Koehn S. An exploratory study of cyberbullying with undergraduate university students. TechTrends. 2011; 55:31–38.

4. Schenk AM, Fremouw WJ. Prevalence, psychological impact, and coping of cyberbully victims among college students. J Sch Violence. 2012; 11:21–37.

5. Olweus, D. Bullying at school: What we know and what we can do. Cambridge, MA: Blackwell; 1993.

6. Dooley JJ, Pyzalski J, Cross D. Cyberbullying versus face-to-face bullying: A theoretical and conceptual review. J Psychol. 2009; 217:182–188.

7. Menesini, E.; Nocentini, A.; Palladino, BESH., et al. Definitions of cyberbullying. In: Smith, P.; Steffgen, G., editors. Cyberbullying through the new media: Findings from an international network. New York: Psychology Press; 2013. p. 23-36.

8. Cross D, Shaw T, Hearn L, et al. Australian covert bullying prevalence study (ACBPS). Perth: Child Health Promotion Research Centre, Edith Cowan University. 2009

9. Spears B, Slee P, Owens L, et al. Behind the scenes and screens: Insights into the human dimension of covert and cyberbullying. J Psychol. 2009; 217:189–196.

10. Hamburger, ME.; Basile, KC.; Vivolo, AM. Measuring bullying victimization, perpetration, and bystander experiences: A compendium of assessment tools. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2011.

11. Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. Psychol Bull. 1992; 112:64–105. [PubMed: 1529040]

12. Jessor R, Turbin M, Costa F. Protective factors in adolescent health behavior. J Pers Soc Psychol. 1998; 75:788–800. [PubMed: 9781412]

13. Garmezy, N. Stress-resistant children: The search for protective factors. In: Stevenson, JE., editor. Recent research in developmental psychopathology, book suppl j child psychol psychiatr no 4. Oxford: Pergamon Press; 1985. p. 213-233.

14. Bronfenbrenner, U. The ecology of human development: Experiments by nature and design. Cambridge, MA: Harvard University Press; 1979.

15. Katzer C, Fetchenhauer D, Belschak F. Cyberbullying: Who are the victims? A comparison of victimization in internet chatrooms and victimization in school. J Media Psychol. 2009; 21:25–36.

16. Sticcia F, Ruggieri S, Alsaker F, et al. Longitudinal risk factors for cyberbullying in adolescence. J Community Appl Soc Psychol. 2013; 1:52–67.

17. Chapell MS, Hasselman SL, Kitchin T, et al. Bullying in elementary school, high school, and university. Adolescence. 2006; 41:633–648. [PubMed: 17240771]

18. Hemphill SA, Kotevski A, Tollit M, et al. Longitudinal predictors of cyber and traditional bullying perpetration in australian secondary school students. J Adolesc Health. 2012; 51:59–65. [PubMed: 22727078]

19. Kowalski RM, Limber SP. Electronic bullying among middle school students. J Adolesc Health. 2007; 41:S22–S30. [PubMed: 18047942]

20. Li Q. Cyberbullying in schools a research of gender differences. Sch Psychol Int. 2006; 27:157–170.

21. Williams KR, Guerra NG. Prevalence and predictors of internet bullying. J Adolesc Health. 2007; 41:S14–S21. [PubMed: 18047941]

22. Duhue F, Bolman C, Vollink T. Cyberbullying: Youngsters' experiences and parental perception. Cyberpsychol Behav. 2008; 11:217–223. [PubMed: 18422417]

23. Demosthenous HT, Bouhours T, Demosthenous CM. Socioeconomic status & youth aggression in australia. Youth Studies Australia. 2002; 21:11.

24. Swearer SM, Espelage DL, Vaillancourt T, et al. What can be done about school bullying? Linking research to educational practice. Educ Res. 2010; 39:38–47.

25. Cook CR, Williams KR, Guerra NG, et al. Predictors of bullying and victimization in childhood and adolescence: A meta-analytic investigation. Sch Psychol Q. 2010; 25:65–83.

26. Egan SK, Perry DG. Does low self-regard invite victimization? Dev Psychol. 1998; 34:299–309. [PubMed: 9541782]

27. Wang J, Iannotti RJ, Nansel TR. School bullying among adolescents in the united states: Physical, verbal, relational, and cyber. J Adolesc Health. 2009; 45:368–375. [PubMed: 19766941]

28. Ybarra ML, Mitchell KJ. Online aggressor/targets, aggressors, and targets: A comparison of associated youth characteristics. J Child Psychol Psychiatry. 2004; 45:1308–1316. [PubMed: 15335350]

29. Hawkins, JD.; Herrenkohl, TI.; Farrington, DP., et al. Predictors of youth violence. Washington DC: The Office of Juvenile Justice and Delinquency Prevention - Juvenile Justice Bulletin; 2000.

30. Baldry AC. Bullying in schools and exposure to domestic violence. Child Abuse Negl. 2003; 27:713–732. [PubMed: 14627075]

31. Beran T, Violato C. A model of childhood perceived peer harassment: Analyses of the canadian national longitudinal survey of children and youth data. J Psychol. 2004; 138:129–147. [PubMed: 15218785]

32. Shields A, Cicchetti D. Parental maltreatment and emotion dysregulation as risk factors for bullying and victimization in middle childhood. J Clin Child Psychol. 2001; 30:349–363. [PubMed: 11501252]

33. Dodge KA, Dishion TJ, Lansford JE. Deviant peer influences in intervention and public policy for youth. Soc Policy Rep. 2006; 20:3–19.

34. McMorris BJ, Hemphill SA, Toumbourou JW, et al. Prevalence of substance use and delinquent behavior in adolescents from victoria, australia and washington state, united states. Health Educ Behav. 2007; 34:634–650. [PubMed: 16740513]

35. Glaser RR, Van Horn ML, Arthur MW, et al. Measurement properties of the communities that care youth survey across demographic groups. J Quant Criminol. 2005; 21:73–102.

36. Hemphill SA, Heerde JA, Herrenkohl TI, et al. Risk and protective factors for adolescent substance use in washington state, the united states and victoria, australia: A longitudinal study. J Adolesc Health. 2011; 49:312–320. [PubMed: 21856525]

37. StataCorp. Stata statistical software: Release 12. College Station, TX: StataCorp, LP; 2011.

38. Tabachnick, BG.; Fidell, LS. Using multivariate statistics. 6. Boston, USA: Pearson Education Inc.; 2013.

39. Farrington DP, Loeber R. Epidemiology of youth violence. Child Adolesc Psychiatr Clin N Am. 2000; 9:733–748. [PubMed: 11005003]

40. Dishion TJ, Andrews DW. Preventing escalation in problem behaviors with high-risk young adolescents: Immediate and 1-year outcomes. J Consult Clin Psychol. 1995; 63:538. [PubMed: 7673531]

Implications and Contribution

To date, few studies have examined the adolescent predictors of young adult cyber-bullying perpetration and victimization. In this study, 19% of young adults have experience with cyber-bullying. Potential prevention targets include adolescents' social, emotion control, and conflict resolution skills, as well as family rule-setting and monitoring of adolescent behavior.

Table 1

Descriptive statistics (means, standard deviations, percentages) for adolescent risk and protective factors (*N* = 662)

Adolescent predictors	No. of items in scale	Response options	Cronbach's alpha	No bullying Mean (SD)	Bully only Mean (SD)	Victim only Mean (SD)	Bully & victim Mean (SD)
Continuous measures							
Individual level risk factors							
Academic failure (e.g., what students' grades/marks were like last year, putting all of their grades together; asking students whether their school grades are better than the grades of most students in their class)	2	4-point scale (*Very good to very poor* for item 1 and *Definitely yes to definitely no* for item 2	.76 The correlation between these two items = .61	1.7 (0.6)	1.9 (0.6)	1.9 (0.6)	1.9 (0.7)
Low commitment to school (e.g., how often students felt positive or negative towards school, as well as how important they felt school was)	9	*Never* (1) to *almost always* (5)	.76	2.2 (0.6)	2.3 (0.5)	2.4 (0.7)	2.6 (0.6)
Emotion control (e.g., I am always able to keep my feelings under control, I control my temper when people are angry with me)	4	*Definitely no* (1) to *definitely yes* (4)	.75	2.7 (0.6)	2.6 (0.6)	2.4 (0.6)	2.6 (0.7)
Peer group risk factor							
Interaction with antisocial friends (e.g., how many of their best friends in the past year have: been suspended; carried a weapon; sold illegal drugs)	9	*None of my friends* (0) to *4 of my friends* (4)	.86	1.2 (0.4)	1.4 (0.7)	1.4 (0.6)	1.4 (0.6)
Family level risk factors							
Poor family management (e.g., would parents know if they did not come home on time, have clear rules in the family)	9	*Definitely no* (4) to *definitely yes* (1)	.83	1.9 (0.5)	2.2 (0.6)	1.9 (0.6)	2.1 (0.5)
Family conflict (e.g., the family argues about the same	3	*Definitely no* (1) to	.82	2.1 (0.8)	2.4 (0.8)	2.4 (0.8)	2.4 (0.7)

Adolescent predictors	No. of items in scale	Response options	Cronbach's alpha	No bullying Mean (SD)	Bully only Mean (SD)	Victim only Mean (SD)	Bully & victim Mean (SD)
things over and over, have serious arguments, or often insult or yell at each other)		*definitely yes (4)*					
Family level protective factor							
Attachment to mother (e.g. students asked if they felt very close to their mother and if they shared their thoughts and feelings with their father,)	2	*Definitely no (1) to definitely yes (4)*	.82 The correlation between these two items = .69	3.1 (0.7)	2.8 (0.8)	3.1 (0.8)	2.9 (0.9)
Attachment to father (e.g., students asked if they felt very close to their father and if they shared their thoughts and feelings with their father).	2	*Definitely no (1) to definitely yes (4)*	.84 The correlation between these two items = .72	2.8 (0.8)	2.6 (0.8)	2.5 (0.9)	2.6 (1.0)
Categorical Measures				*n* (%)	*n* (%)	*n* (%)	*n* (%)
Individual level risk factors							
Traditional bullying victimization (i.e., asked students if they had been "bullied recently [teased or called names, had rumours spread about you, been deliberately left out of things, threatened physically or actually hurt]."	1	*Never; Less than a few times a year; A few times a year; Once or twice a month; Once or twice a day; and Everyday or most days*	N/A				
Traditional bullying perpetration (i.e., asked students if they had taken part in "bullying another student(s) at school recently" using definition for victimization).							
No traditional bullying or victimization				343 (64.5)	12 (35.3)	13 (39.4)	23 (36.5)
Traditional bullying only				28 (5.3)	8 (23.5)	3 (9.1)	12 (19.1)
Traditional victim only				113 (21.2)	6 (17.7)	12 (36.4)	11 (17.5)
Both traditional bully and victim				48 (9.0)	8 (23.5)	5 (15.2)	17 (27.0)
Cyber-bullying victimisation (i.e., students were asked if in the past 12 months they had "been bullied by another student who has used technology such as	1	*No; Yes, less than once a week; Yes,*	N/A				

Adolescent predictors	No. of items in scale	Response options	Cronbach's alpha	No bullying Mean (SD)	Bully only Mean (SD)	Victim only Mean (SD)	Bully & victim Mean (SD)
mobile phones, the Internet, computers, answering machines, or cameras?")		*about once a week;* and *Yes, most days*					
Cyber-bullying perpetration (i.e., students were asked if in the past 12 months they had "bullied another student using technology such as mobile telephones, the internet, computers, answering machines, or cameras?")							
No cyber-bullying or victimization				432 (81.2)	23 (67.7)	20 (60.6)	39 (61.9)
Cyber-bullying only				28 (5.3)	5 (14.7)	4 (12.1)	3 (4.8)
Cyber-victim only				37 (7.0)	2 (5.9)	6 (18.2)	6 (9.5)
Both cyber-bully and victim				35 (6.6)	4 (11.8)	3 (9.1)	15 (23.8)

Note. For traditional bullying victimization and perpetration, scores were dichotomised (0 = Never, 1 = Less than a few times a year to Everyday or most days). For cyber-bullying victimization and perpetration, students reporting no involvement in cyber-bullying perpetration/victimization, were given a score of 0, and students reporting any cyber-bullying perpetration/victimization (less than once a week or more) were given a score of 1.

Analyses excluded 14 "dishonest" students in Grade 9 (students who reported any of the following: a) that they were *not honest at all* when filling out the 2006 survey; b) that they had used a fictional drug in their lifetime or in the past 30 days; or c) that they had used illicit drugs on more than 120 occasions in the past 30 days, a highly improbable amount).

Table 2

Percentage (%) and number of young adult participants engaging in cyber- and traditional bullying perpetration and victimization in the past 12 months

	No cyber-bullying or victimization % (n)	Cyber-bullied others % (n)	Been cyber-bullied % (n)	Cyber-bullying perpetration & victimization % (n)
Total sample	80.36	5.14	4.98	9.52
(*N* = 662)	(532)	(34)	(33)	(63)
Male	73.91	7.36	5.35	13.38[**]
(*n* = 299)	(221)	(22)	(16)	(40)
Female	85.67	3.31	4.68	6.34
(*n* = 363)	(311)	(12)	(17)	(23)

Note. Figures may not total 100% due to rounding; Analyses excluded 14 "dishonest" students in Grade 9 (students who reported any of the following: a) that they were *not honest at all* when filling out the 2006 survey; b) that they had used a drug with a fake name in their lifetime or in the past 30 days; or c) that they had used illicit drugs on more than 120 occasions in the past 30 days, a highly improbable amount).

[**]
$p < 0.001$ for Chi-square comparison of males and females. Analysis of standardised residuals revealed that the differences were in the combined cyber-bullying perpetration and victimization group with higher rates for males than females.

Table 3

Results of unadjusted logistic regression analyses of the adolescent risk and protective factors associated with young adult cyberbullying perpetration and victimization (N = 658)

G9 predictor	Cyberbullied others RRR (95% CI)	Been cyberbullied RRR (95% CI)	Cyberbullying perpetration and victimization RRR (95% CI)
Being male	2.58 (1.26, 5.26)*	1.40 (.68, 2.88)	2.44 (1.38, 4.31)**
Age	1.44 (.54, 3.85)	1.66 (.75, 3.70)	1.46 (.86, 2.48)
Traditional bully	8.47 (3.13, 22.92)***	2.93 (.73, 11.76)	6.63 (2.93, 15.01)***
Cyberbully	3.34 (1.23, 9.07)*	3.07 (1.02, 9.24)*	1.18 (.33, 4.25)
Traditional victim	1.55 (.59, 4.03)	2.61 (1.09, 6.25)*	1.48 (.69, 3.18)
Cyberbullying victim	1.04 (.25, 4.24)	2.99 (.90, 9.89)	1.84 (.75, 4.52)
Traditional bully and victim	4.76 (1.84, 12.36)**	2.74 (1.01, 7.49)*	5.28 (2.63, 10.63)***
Cyberbully and victim	2.14 (.67, 6.81)	1.84 (.55, 6.14)	4.73 (2.53, 8.82)***
Academic failure	1.73 (1.10, 2.71)*	1.60 (.94, 2.73)	1.83 (1.22, 2.75)**
Low school commitment	1.30 (.80, 2.12)	1.71 (.96, 3.05)	2.46 (1.70, 3.55)***
Emotion control	.72 (.41, 1.27)	.44 (.23, .84)*	.73 (.45, 1.18)
Association with antisocial friends	2.82 (1.33, 5.96)**	2.41 (1.28, 4.55)**	2.91 (1.76, 4.81)***
Poor family management	3.26 (1.67, 6.33)**	1.08 (.54, 2.16)	2.30 (1.45, 3.64)***
Family conflict	1.53 (1.01, 2.32)*	1.57 (.98, 2.51)	1.70 (1.25, 2.31)**
Attachment to mother	.59 (.38, .91)*	.98 (.59, 1.61)	.76 (.53, 1.09)
Attachment to father	.78 (.54, 1.14)	.68 (.46, 1.02)	.77 (.55, 1.06)

Analyses excluded 14 "dishonest" students in Grade 9 (students who reported any of the following: [1] that they were not honest at all when filling out the 2006 survey; [2] that they had used a fictional drug in their lifetime or in the past 30 days; or [3] that they had used illicit drugs on >120 occasions in the past 30 days, a highly improbable amount).

CI = confidence interval; G9 = Grade 9; RRR = relative risk ratio.

*
$p < .05$;

**
$p < .01$;

***
$p < .001$.

Table 4

Results of fully adjusted logistic regression analyses of the adolescent risk and protective factors associated with young adult cyber-bullying perpetration and victimization ($N = 658$).

G9 predictor	Cyber-bullied others	Been cyber bullied	Cyber-bullying perpetration & victimization
	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)
Being male	.48 (.22, 1.07)	.60 (.29, 1.24)	.41 (.21, .80)**
Age	1.14 (.44, 2.97)	1.63 (.70, 3.82)	1.21 (.66, 2.24)
Traditional bully	4.43 (1.38, 14.25)*	1.83 (.35, 9.42)	3.84 (1.54, 9.58)**
Cyber-bully	2.59 (.80, 8.41)	2.51 (.74, 8.48)	.63 (.13, 3.08)
Traditional victim	1.68 (.59, 4.79)	1.74 (.74, 4.09)	1.06 (.43, 2.65)
Cyber-bullying victim	.80 (.18, 3.55)	1.93 (.57, 6.55)	1.64 (.60, 4.48)
Traditional bully & victim	3.61 (1.09, 11.99)*	1.58 (.48, 5.17)	2.21 (.94, 5.20)
Cyber-bully & victim	1.27 (.33, 4.83)	1.18 (.32, 4.38)	2.76 (1.16, 6.55)*
Academic failure	1.30 (.78, 2.15)	1.25 (.67, 2.34)	1.06 (.69, 1.63)
Low school commitment	.38 (.18, .82)*	.92 (.48, 1.75)	1.38 (.89, 2.16)
Emotion control	.84 (.44, 1.59)	.53 (.29, .99)*	.88 (.54, 1.44)
Association with antisocial friends	1.94 (.79, 4.74)	1.66 (.89, 3.11)	1.33 (.77, 2.27)
Poor family management	2.46 (1.13, 5.37)*	.71 (.32, 1.58)	1.43 (.80, 2.57)
Family conflict	1.30 (.82, 2.04)	1.20 (.74, 1.96)	1.31 (.89, 1.93)
Attachment to mother	.77 (.43, 1.41)	1.30 (.74, 2.31)	1.17 (.76, 1.80)
Attachment to father	1.09 (.67, 1.78)	.74 (.47, 1.16)	.93 (.66, 1.32)
Pseudo R^2 for entire Model			.13

Note. OR = odds ratio; CI = confidence interval; G9 = Grade 9

Analyses excluded 14 "dishonest" students in Grade 9 (students who reported any of the following: a) that they were *not honest at all* when filling out the 2006 survey; b) that they had used a fictional drug in their lifetime or in the past 30 days; or c) that they had used illicit drugs on more than 120 occasions in the past 30 days, a highly improbable amount).