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ORIGINAL PAPER

A Comparison of Traditional Victims, Cyber Victims, Traditional-Cyber Victims, and Uninvolved Adolescents: A Social-Ecological Framework

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Abstract

Background Very few studies explicitly investigate the prevalence, similarities, and differences among adolescents who experience one or both types of bullying victimization.

Objective The exploratory study aims to illustrate patterns of concurrence of traditional bullying and cyberbullying victimization and identify similarities and differences of traditional victims, cyber victims, and traditional-cyber victims within the social-ecological theoretical framework.

Method Multinomial logistic regressions were constructed employing the data from the 2013 National Crime Victimization Survey School Crime Supplement with a nationally representative sample of adolescents aged 12 to 18 who were selected through a stratified multistage cluster sample of households across the United States.

Results Traditional victims were the most prevalent type of victims followed by traditional-cyber victims and finally cyber victims. The relationships between social-ecological contexts and bullying victimization were relied on whether bullying victimization was offline, online, or both. There were shared and unique predictors observed that distinguished between traditional victims, cyber victims, and traditional-cyber victims.

Conclusions Findings suggest the social-ecological theory may not work similarly for explaining different forms of bullying victimization. It may be beneficial to the development of intervention programs that consider both universal and unique strategies targeted specifically for youth who are victimized by traditional bullying, cyberbullying, or both.

Keywords Traditional victims · Cyber victims · Traditional-cyber victims · Social-ecological theory · Multinomial logistic regressions

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Introduction

Regardless of the exact extent and severity, bullying victimization is a serious social and educational concern world-wide. This concern arises, in part, due to its extensive and long-term detrimental effects on the psychological, emotional, physical, and social health of victims (Horner et al. 2015). Bullying is generally defined as aggressive and intentional behaviors perpetrated by an individual or a group of individuals repeatedly and over time against victims who cannot easily defend themselves (Olweus 1993). With increased use of the internet, computers, and mobile phones, bullying has taken on a new and more insidious form, expanding from the physical to the virtual (Guo 2016). The cyber form of bullying is characterized by intentional and aggressive activities conducted via electronic communication technologies (e.g., instant messaging, chat rooms, e-mail, and text messages) (Mason 2008). In cyberspace, an act can persist even if it is not conducted repeatedly (Menesini et al. 2012).

Bullying has immediate and long-term negative consequences for victims. Even in adulthood, some victims may still suffer from severe intra- and inter-personal difficulties (Ttofi et al. 2011). It has been suggested that both traditional bullying and cyberbullying victimization are significantly related to impaired social and psychological wellbeing among adolescents, resulting in a series of internalizing and externalizing problems (Kowalski et al. 2014; Zych et al. 2019). Nevertheless, the impacts of cyberbullying victimization seem to be more severe than those of traditional bullying (Campbell et al. 2012; Perren et al. 2010). The increased severity of impact may be due to unique features of the online environment, such as publicity, wide audiences, perpetrator anonymity, and 24/7 access (Dredge et al. 2014; Patchin and Hinduja 2006). Moreover, adolescents who experience both traditional bullying and cyberbullying are more likely to suffer from subsequent distress, anxiety, depression, and social isolation, and to demonstrate declines in school attendance and academic performance (Landstedt and Persson 2014; Sinclair et al. 2012). The differences in the severity of negative impacts suggest the importance of continued research examining factors that distinguish between traditional bullying and cyberbullying victimization.

Although studies have investigated the co-occurrence of traditional bullying and cyberbullying, there is still disagreement on whether cyberbullying is merely another form of traditional bullying sharing common predictors, or is a distinct phenomenon calling for unique forms of assessment and intervention (Hemphill et al. 2012; Li et al. 2012; Low and Espelage 2013). Moreover, very few studies explicitly investigate the impact of different forms of bullying victimization, such as traditional bullying only, cyberbullying only, or both. It is still necessary to explore how these forms of victimization differ from each other. Individuals targeted by both traditional bullying and cyberbullying may represent a particularly vulnerable group of victimized students (Cross et al. 2015). Certain factors may increase students' vulnerability to face-to-face bullying only or cyberbullying only, while other factors may increase victimization face-to-face and also in cyberspace. Understanding the risk and protective factors associated with different forms of bullying victimization is critical to the design of effective interventions.

Social-Ecological Theoretical Framework

With respect to factors which may underlie traditional bullying and cyberbullying victimization, studies have recognized the importance of considering the social-ecological theory proposed by Bronfenbrenner (1979). The theory posits that family, peer, school, and community contexts provide individuals with social environments where they can interact with

parents, peers, teachers, and other adults, and that these interactions cultivate perceptions of, attitudes toward, and coping strategies in response to various behaviors (Erginoz et al. 2015). Indeed, the social-ecological theory has been widely applied to the conceptualization of bullying victimization, and studies have identified a wide range of individual characteristics and contextual factors that either increase or reduce the risk of bullying victimization (e.g., Barboza et al. 2009; Espelage et al. 2015; Ettekal et al. 2015; Hong and Espelage 2012; Jeong et al. 2013). Researchers and practitioners have also emphasized the importance of social context in assessing an individual's risk and protective factors for bullying victimization and for developing intervention strategies (Hong et al. 2016).

It is clear from both theory and research that bullying victimization does not occur in isolation, but instead is an ecological phenomenon influenced by individual-, family-, peer-, school-, and community-level factors (Espelage 2014; Espelage et al. 2015). Therefore, developing a more comprehensive understanding of bullying requires an examination of different ecological factors that promote or inhibit victimization across multifaceted contexts (e.g., Espelage 2014; Ettekal et al. 2015). However, the theory has been primarily applied to analysis of traditional forms of bullying. Limited evidence is available to understand and identify social contexts and negative consequences related to cyberbullying victimization (Baldry et al. 2015). The use of social-ecological approaches to prevent and intervene in cyberbullying victimization requires theoretical or empirical evidence to specify which ecologies can provide the best outcomes. Given the significant co-occurrence of traditional bullying and cyberbullying victimization (Hinduja and Patchin 2008; Vandebosch and Van Cleemput 2009), some of factors that are related to traditional bullying may help to explain cyberbullying until the behavior is understood comprehensively. In addition, cyberbullying victimization has been explained by a variety of individual and social characteristics (Zych et al. 2019), which suggests that the social-ecological theory may offer guidelines for researchers, policymakers, and practitioners to explore multifaceted contexts involved in cyberbullying victimization.

Overall, the social-ecological framework is suitable for examining risk and protective factors of bullying victimization, so that a variety of individual and contextual factors can be considered when developing and implementing intervention strategies. Very few studies explicitly compare different forms of bullying victimization and identify potential risk profiles from a holistic perspective by including multifaceted factors. To construct a more thorough portrait of bullying-involved adolescents, the current study uses the social-ecological framework as a basis for identifying and comparing unique and shared factors predicting traditional bullying and/or cyberbullying victimization across individual, family, peer, and school contexts.

Social-Ecological Factors Related to Bullying Victimization

Empirical research demonstrates that traditional bullying victimization occurs most often between the 6th and 8th grades and then declines slowly as the young person ages (Cook et al. 2010). Some studies indicate that males report more face-to-face bullying victimization than females (Vaillancourt et al. 2010), while others find no significant gender differences (Ball et al. 2008). Similarly, although some studies have found racial differences in traditional bullying victimization (Spriggs et al. 2007), others have not reported significant racial variations (Seals and Young 2003). Research examining age, gender, and race as predictors of cyberbullying victimization has also produced mixed results. Some studies report no age, gender, and racial differences in cyberbullying victimization (Juvonen and

Gross 2008; MacDonald and Roberts-Pittman 2010; Scholte et al. 2007). However, others indicate that middle and high school students appear to be most vulnerable to cyberbullying; females are more likely to be cyberbullied than males; and African Americans are less involved as victims of cyberbullying than Caucasian adolescents (Tokunaga 2010; Wang et al. 2009). Moreover, Barboza (2015) finds that non-whites and females are more likely than whites and males to be victims of both traditional bullying and cyberbullying.

Several individual factors are found to be common across traditional bullying and cyberbullying victimization, such as low academic achievement (Mitchell et al. 2007; Wang et al. 2014); other forms of criminal and non-criminal victimization experiences (Perreault 2013); externalizing or behavioral problems, such as physical fighting, weapon carrying, or school truancy (Fisher et al. 2016; Kim et al. 2017); internalizing symptoms, including depression, anxiety, or low self-esteem (Kowalski and Limber 2013); or poor social and emotional competencies (Randa and Reyns 2014). Victims of cyberbullying similarly become fearful of being victimized while at school, even though most cyberbullying occurs outside school (Randa 2013). In addition, Barboza (2015) indicates that traditional-cyber victims tend to skip classes, avoid school-based activities, and engage in aggressive behaviors (i.e., being in physical fights, carrying a gun to school). Extracurricular activity is also associated with an increased risk of being victims of traditional bullying, even though the relation depends on specific activities they actually participate in (Peguero 2008). Nevertheless, its relationship with cyberbullying victimization has yet to be studied.

Most studies indicate that family context plays an important role in shaping students' behaviors and experiences, including bullying involvement. As with traditional bullying, Fanti et al. (2012) indicate that students from a more economically and socially secure and physically and emotionally healthier family background face a lower risk of being cyberbullied. Similarly, students from families of lower socioeconomic status (SES) and household income (Görzig 2011; Hong et al. 2016), or single-parent families with a lack of family support (Taiariol 2010) tend to be at a greater risk of traditional bullying or cyberbullying victimization. In contrast, Sourander et al. (2000) indicate that family SES and structure are not significantly associated with bullying victimization. Although household urbanicity is not widely investigated, it may also be an important predictor of bullying victimization at school. Olsen (2010), for instance, has indicated that children from rural schools are more likely to be bullied verbally and physically than those from suburban and urban schools. However, no significant differences in the frequency of being bullied are observed among youth from urban, suburban, town, and rural areas in the study of Nansel et al. (2001). The inconsistency requires further investigations.

Strong and supportive friendships can also reduce the impact of bullying victimization directly by providing victims with social and emotional support (Kendrick et al. 2012). Peer status, influence, and support are protective against different forms of victimization. Perceived peer support has been found to be associated with a decreased risk of being a victim of traditional bullying (Heerde and Hemphill 2017), cyberbullying (Kowalski et al. 2014), both traditional bullying and cyberbullying (Burton et al. 2013). Support from friends may also represent a potential coping mechanism for dealing with bullying victimization (Holt and Espelage 2007). Peer antisocial influence, not surprisingly, impacts the occurrences of bullying victimization, since exposure to delinquent peers who are involved in substance use, aggression, or weapon carrying may enhance the risk of being victimized at school and in cyberspace (Hemphill and Heerde 2014; Kowalski et al. 2014).

In addition, schools are important places in which students' risk of experiencing bullying can be reduced or increased. Adolescents who are bullied have less sense of school belonging and experience more difficulty in developing interpersonal relationships at school than

noninvolved peers (Furlong et al. 1995). A negative school climate or disordered school environment, specifically characterized by a lack of teacher support, absence of clear rules, poor school safety, or high levels of gang activity or substance use, is reported to be associated with involvement in traditional bullying and cyberbullying (Casas et al. 2013; Kowalski et al. 2014; Wang et al. 2014). Supportive interactions with teachers may decrease children's alienation from school and increase their ability to cope with both internalizing and externalizing problems caused by victimization (Dwyer et al. 2000). Regarding strategies targeted for school security, some studies find that school guardianship, such as metal detectors, and security guards, are effective in reducing the risk of school victimization (DeVoe et al. 2004), whereas others indicate such strategies are unsuccessful (Wynne and Joo 2011). Therefore, it is imperative to consider differences in implementation of such strategies, and effects of different school characteristics when investigating both offline and online victimization.

Although individual characteristics and broader socioenvironmental contexts of bullying victimization have been widely investigated in previous studies, there are some research gaps that need to be addressed. Specifically, the characteristics of traditional-cyber victims remain unclear since these have been less examined in existing studies as compared to those of traditional victims and cyber victims. As discussed above, research on predictors of bullying victimization yields mixed results on certain factors, such as age, gender, race, family SES, family structure, household urbanicity, and school safety, which suggests that further investigation is needed. Furthermore, most social-ecological factors, such as extracurricular activity, household urbanicity, or certain school aspects, are only examined for traditional victims only or cyber victims only. Overall, very few studies have examined and compared various social-ecological contexts concurrently across traditional, cyber, and traditional-cyber victims.

The Present Study

In order to address the gaps in the existing literature, this exploratory study aims to (1) examine the prevalence of traditional, cyber, and traditional-cyber victims; and (2) identify the similarities and differences across the three types of victims by comparing certain social-ecological factors available in the studied data. To this end, a relatively comprehensive model of bullying victimization is constructed consisting of social-ecological factors mainly related to individual, family, peer, and school characteristics. Ideally, the study can contribute to identifying risk profiles for different types of bullying victims in order to facilitate early detection of bullying so that intervention strategies can be introduced to reduce the overall risk of online and offline bullying.

Method

Data and Sample

This study used one of the recent national-level collections of data on school crime, the 2013 National Crime Victimization Survey (NCVS) School Crime Supplement (SCS) in the United States. The NCVS-SCS data, a public secondary dataset, did not involve individually identifiable private information. Therefore, IRB review was not required in this study. The target populations of NCVS were adolescents aged 12 years old or older. In

2013, after completing NCVS, 5726 students aged 12 to 18 were screened for eligibility to participate in the SCS interview. To be eligible, respondents were required to (1) have been enrolled sometime during the six months prior to the interview, (2) be currently enrolled in a primary or secondary education program leading to a high school diploma (i.e., elementary through high school), (3) be not enrolled in 5th grade or under, and (4) be not exclusively homeschooled during the school year (U.S. Department of Justice Bureau of Justice Statistics 2013). A total of 5008 NCVS respondents met the criteria to complete the SCS interview.

The SCS is ideal for the current study because it captures a large, nationally representative sample. The 2013 SCS collected data on both cyberbullying and traditional bullying victimization, as well as a variety of student characteristics and multiple social contexts that might be related to bullying victimization. Because homeschooled students were at a lower risk of exposure to bullying victimization at school than non-homeschooled students, students who were homeschooled at any time during the school year were excluded from the current study. The final sample consisted of 4942 respondents, 48.40% female (n = 2392) and 51.60% male (n = 2550), and included 54.84% White (n = 2710), 13.05% Black (n = 645), 23.72% Hispanic (n = 1172), and 8.40% other race (n = 415). The mean age of the studied sample was 14.71 years old (SD = 1.87). The detail information of all studied variables can be found in Table 1.

Measures

Dependent Variables

The SCS measured *traditional bullying victimization* using a seven-item scale based on the revised Olweus Bully/Victim Questionnaire (Solberg and Olweus 2003), asking respondents to answer the following questions: Has another student (1) "made fun of you, called you names or insulted you?"; (2) "spread rumors about you?"; (3) "threatened you with harm?"; (4) "pushed you, shoved you, tripped you or spit on you?"; (5) "tried to make you do things you did not want to do, for example, give them money or other things?"; (6) "excluded you from activities on purpose?"; and (7) "destroyed your property on purpose. The internal consistency reliability of the scale was very high (alpha = 0.90). All seven items were combined into one dichotomous variable coded as "yes (1)" if students reported experiencing at least one of these victimizations and "no (0)" if they reported none of these victimization incidents.

Cyberbullying victimization was assessed using a six-item scale adapted from the scale used by Randa and Reyns (2014), in which respondents were asked a series of questions: Has another student (1) "posted hurtful information about you on the Internet, for example, on a social networking site like MySpace or Facebook?"; (2) "threatened or insulted you through email?"; (3) "threatened or insulted you through instant messaging?"; (4) "threatened or insulted you through text messaging?"; (5) "threatened or insulted you through online gaming, for example, while playing a game, through Second Life, or through XBOX [live]?"; and (6) "purposefully excluded you from an online community, for example, a buddy list or friends list?". The internal consistency reliability of the scale was high (alpha = 0.88). These six binary items were then combined into one dichotomous variable representing whether students were cyberbullied or not cyberbullied.

Table 1 Descriptive statistics of dependent and independent variables

Variables	Valid *N*	Categories	Frequencies	Percentage
Dependent variables				
Bullying victimization	4905	Noninvolved[a]	3764	76.74
		Traditional victims	812	16.55
		Cyber victims	74	1.51
		Traditional-cyber victims	255	5.20
Independent variables				
Gender	4942	Male (1)	2550	51.60
		Female (0)	2392	48.40
Race	4942	White[a]	2710	54.84
		Black	645	13.05
		Hispanic	1172	23.72
		Other	415	8.40
Physical fighting	4911	Fight (1)	176	3.58
		No fight (0)	4735	96.42
School truancy	4897	Truant (1)	247	5.04
		No Truant (0)	4650	94.96
Criminal victimization	4942	Yes (1)	95	1.92
		No (0)	4847	98.08
Hate-crime victimization	4923	Yes (1)	285	5.79
		No (0)	4638	94.21
Household urbanicity	4942	Urban[a]	1448	29.30
		Suburban	2681	54.25
		Rural	813	16.45
Family structure	4936	Two parent (1)	1652	33.47
		One parent (0)	3284	66.53
Peer weapon carrying	4901	Yes (1)	167	3.41
		No (0)	4734	96.59
Peer drug use	4913	Yes (1)	1461	29.74
		No (0)	3452	70.26
School sector	4938	Public (1)	4560	92.35
		Private (0)	378	7.65
School level	4901	Elementary school[a]	350	7.14
		Middle school	1504	30.69
		High school	3047	62.17
School gangs	4900	Gangs (1)	598	12.20
		No gangs (0)	4302	87.80

Independent variables	Valid *N*	Minimum	Maximum	M	SD
Age	4942	12	18	14.71	1.87
Academic achievement	4830	1	5	4.22	0.76
Extracurricular activities	4914	0	7	1.21	1.19
Weapon carrying	4902	0	3	0.03	0.22
Avoidance behavior	4906	0	11	0.12	0.63
Fear of harm	4901	1	4	1.15	0.37
Household income	4036	1	7	5.25	1.80

Table 1 (continued)

Independent variables	Valid *N*	Minimum	Maximum	M	SD
Family SES	4926	1	8	4.18	1.74
Peer support	4910	1	4	1.51	0.56
School drugs	4912	0	11	1.40	2.24
School safety	4920	0	9	5.88	1.49
School rules	4870	0	5	4.54	0.86
Teacher attitudes	4942	0	3	0.99	0.12

Sample sizes are unweighted. All analyses are weighted to be nationally representative

[a]Reference group

Based on the two dichotomous variables on traditional bullying and cyberbullying victimization, respondents were then further classified into four groups as *traditional victims*, *cyber victims*, *traditional-cyber victims*, and *noninvolved* (the reference group). Students were categorized as *traditional victims* if they had experienced only face-to-face bullying, as *cyber victims* if they had experienced only cyberbullying, as *traditional-cyber victims* if they had experienced both traditional bullying and cyberbullying, and as *noninvolved* if they reported experiencing no bullying.

Independent Variables

Individual Factors For *gender*, male was recoded 1 and female 0. *Race* was collapsed into four categories: White (the reference group), Black, Hispanic, and Others. *Academic achievement* was a continuous variable reflecting the respondent's predominant performance across all subjects during the school year. After recoding, higher values reflected better academic achievement (Fs = 1, Ds = 2, Cs = 3, Bs = 4, As = 5). *Extracurricular activities* were assessed by questions asking respondents to report if they had participated in the following activities sponsored by the school: athletic teams at school, spirit groups, performing arts, academic clubs, student government, community service\volunteer clubs, and other school clubs\activities. One composite variable ranging from 0 to 7 was created by summing the seven items, in which higher values reflected greater participation in extracurricular activities. Externalizing problems were captured by dichotomous variables of weapon carrying, physical fighting, and school truancy. *Weapon carrying* was used to report whether respondents had ever carried a gun, a knife brought as a weapon, or other weapon to school or onto school grounds (carry at least one weapon = 1, carry no weapon = 0). *Physical fighting* was captured by a question asking if the respondent had been involved in physical fights at school. *School truancy* was used to record whether the respondent had skipped any class or school days during the school year.

Internalizing problems consisted of avoidance behavior and fear of harm. *Avoidance behavior* was captured by several items asking respondents to report if they had ever stayed away from certain activities or locations at school because of the fear of being victimized. The items were comprised of avoiding: the shortest route to school; the entrance into the school; hallways or stairs; parts of the school cafeteria; school restrooms; other places inside the school building; the school parking lot; other places on school grounds; any activities at your school; any classes; and school. An additive index of avoidance behavior was thus created ranging from 0 to 11, in which higher values indicated more avoidance

behaviors. *Fear of harm* was measured by two questions that ask respondents how often they were afraid of being attacked or harmed by another student at school or on the way to and from school. Exploratory factor analysis (EFA) results indicated that the items loaded on one factor with factor loading scores all above 0.83. This measure displayed adequate internal consistency reliability (alpha = 0.70). The two items were then averaged, producing a range from 1 to 4 so that higher values reflected greater fear of being victimized.

Criminal victimization was captured by items asking if respondents had ever experienced any violent and property crimes including a rape, robbery, assault, burglary, theft, and so on. These items were combined into one dichotomous variable indicating whether respondents had experienced at least one incident of criminal victimization. *Hate-crime victimization* was measured by seven binary items asking if respondents had been involved in any hate-related abuse, including verbal threats or intimidation based on race, religion, ethnicity or national origin, disability, gender, or sexual orientation. These items were then combined into one dichotomous variable indicating whether respondents had ever experienced any of hate-crime victimization. Both *criminal victimization* and *hate-crime victimization* were dichotomized because only a small number of students had experienced more than one hate crime or instance of criminal victimization.

Family Factors *Household urbanicity* was classified into three categories: Urban (the reference group), Suburban, and Rural. *Household income* was collapsed into seven categories: 1 = "Less than $7,500", 2 = "$7,500–14,999", 3 = "$15,000–24,999", 4 = "$25,000–34,999", 5 = "$35,000–49,999", 6 = "$50,000–74,999", and 7 = "$75,000 or more." *Family structure* was recoded as a dichotomous variable (single-parent family = 0, two-parent family = 1). *Family SES* was measured by the highest level of education attained in the household, which was treated as a loose proxy of SES. The measure was collapsed into eight categories: 1 = "never attended or dropped out in elementary school," 2 = "dropped out in high school," 3 = "high school graduate," 4 = "college dropout," 5 = "associate's degree," 6 = "bachelor's degree," 7 = "master's degree," and 8 = "PhD, JD or MD."

Peer Factors Peer factors were comprised of three dichotomous variables: peer support, peer weapon carrying, and peer drug use. Specifically, *peer support* was measured on a question asking if students believe there is a friend at school whom they can talk to and who cares about their feelings and what happens to them. *Peer weapon carrying* was used to assess if students know of any other students who have brought a gun to the school. *Peer drug use* was designated by a single question regarding whether or not they are aware of any students who use drugs/alcohol while at school.

School Factors *School sector* consisted of public school (1) and private school (0). The dichotomous variable of *school gangs* was captured by the question indicating whether there are any gangs at school. *School level* was collapsed into three categories reflecting the highest grade taught in the school: 1 = "elementary school" (the reference group), 2 = "middle school", and 3 = "high school." Four other school variables represented indices created from several NCVS-SCS variables: school safety, school rules, school drugs, and teacher attitudes.

The constructs regarding assessments of school security measures as well as measures of the school's culture of rules used by Randa and Reyns (2014) were replicated in the current study. Specifically, *school safety* was measured by nine items asking respondents to report if the school takes any measures to ensure students are safe. The security

measures included security guards or assigned police officers, other school staff or other adults supervising, metal detectors, locked doors, visitors sign in, locker checks, students wear badges or picture identification, security cameras, and a code of student conduct. The items were thus grouped into an additive index ranging from 0 to 9, in which higher values reflected more safety measures.

School rules were measured by a five-item scale that asked respondents to report if they would agree the following statements: (1) "everyone knows school rules"; (2) "school rules are fair"; (3) "punishment is the same no matter who you are"; (4) "school rules are strictly enforced"; and (5) "students know what kind of punishment will follow if a rule is broken." A single-factor EFA model was acceptable with factor loading scores all above 0.51. The items were thus grouped into an additive scale with a good internal consistency reliability (alpha = 0.79). The additive scale ranged from 0 to 18 with higher values reflecting more fair, consistent, and strictly enforced school rules.

Given the measure of *school drugs*, respondents were asked whether each of ten specific drugs (e.g., alcohol, marijuana, cocaine, heroin, etc.) were available for students at school. The additive scale of school drugs ranging from 0 to 11 represented the availability of drugs at school, in which a higher value reflected a more serious drug problem at school. *Teacher attitudes* were captured by a three-item scale asking students to report if they agree (1) "teachers treat students with respect"; (2) "teachers care about students"; and (3) "teachers do or say things that make students feel bad about them" (reversely recoded). EFA results indicated that the items loaded on one factor with factor loading scores all above 0.76. These items were averaged into a composite variable ranging from 1 to 4, in which higher values reflected better teacher attitudes and support (alpha = 0.73).

Analytic Strategies

This study was designed to identify a comprehensive model in which certain individual, family, peer, and school characteristics could be combined to predict students' likelihood of being victims of traditional bullying and/or cyberbullying. First, variance inflation factors (VIF) were constructed for the predictors to detect the issue of multicollinearity. VIF results suggested multicollinearity was not a problem. Next, the multinomial logistic regression (MLR) model was used to determine factors associated with the three types of bullying victims and analyzed their predictive power. In the MLR model, relative risk ratios (RRRs) quantified associations between predictor variables and the probability of being in each of the outcome categories (traditional victims, cyber victims, and traditional-cyber victims) relative to the reference category (noninvolved).

As noted above, the NCVS-SCS data include variables on individual, family, and school levels. However, multilevel modeling analysis is not allowed since that these data don't include any structural-level information, such as school identifier, which is necessary for multilevel analysis. This explains why the current study using the NCVS-SCS data employs MLR instead of multilevel analysis. Household income showed about 18.3% of cases were missing. The percentage of missing data was no greater than 3% for other predictors. Missing data patterns were checked, and the results showed that participants who had missing values were not different from those with observed values, which suggested the data was missing at random (Allison 2002). To get unbiased estimators and keep the data intact, the technique of multiple imputation was used to deal with missing values in the MLR model. All analyses were conducted in STATA using 15 imputed datasets, with adjustments for survey design and weights applied to provide nationally representative estimates.

Results

Prevalence Rates and Co-occurrence of the Two Forms of Bullying Victimization

Table 1 reports the frequency and percentage of each bullying victimization and depicts how much overlap exists between being face-to-face bullied and being cyberbullied. Of the total sample, 76.74% of respondents (n = 3764) reported experiencing neither traditional bullying nor cyberbullying, 16.55% (n = 812) were victims of traditional bullying only, 5.20% (n = 255) were victims of both traditional bullying and cyberbullying, and 1.51% students (n = 74) were victims of cyberbullying only. Overall, traditional-cyberbullying victimization was less frequent than traditional bullying victimization alone, but more frequent than cyberbullying victimization alone. Further investigating co-occurrence of traditional bullying and cyberbullying victimization by cross-table analyses, the results in Table 2 showed that 23.90% of victims of traditional bullying also experienced cyberbullying victimization. Conversely, 77.51% of cyberbullying victims were also victims of traditional bullying. A risk ratio (4.37: [4.01, 4.76]) indicated that students who experienced traditional bullying victimization were over four times more likely to experience cyberbullying victimization than students who did not experience traditional bullying victimization.

Multinomial Logistic Regression

Table 3 reports the results from the MLR model of traditional victims, cyber victims, and traditional-cyber victims. The group that reported having experienced no bullying was treated as the reference group. Relative risk ratios and 95% confidence intervals (CIs) are presented in Table 3. As for individual factors, other race and hate-crime victimization were significant across the three subgroups. Compared to noninvolved peers, students from other racial backgrounds (e.g., Asian) were almost two times more likely to be cyber victims but about 50% less likely to be traditional victims and traditional-cyber victims as compared to Whites. Students who had experienced hate-crime victimization were more likely to be involved as traditional victims, cyber victims, and traditional-cyber victims than those who had never been bullied. Particularly, traditional-cyber victims have the strongest association with hate-crime victimization (RRR = 18.47), followed by the traditional victims (RRR = 9.20), and finally the cyber victims (RRR = 3.10).

Table 2 Percentages of different types of bullying victimization

	Traditional victims (Yes)	Traditional victims (No)	Total
Cyber victims (Yes)	255 77.51% 23.90%	74 22.49% 1.93%	329 100% 6.71%
Cyber victims (No)	812 17.74% 76.10%	3764 82.26% 98.07%	4576 100% 93.29%
Total	1067 21.75% 100%	3838 78.25% 100%	4905 100% 100%
	Point estimate (95% CI)		
Risk ratio	4.37 [4.01, 4.76]		

Table 3 Multinomial logistic regression model of bullying victimization

Predictors	Traditional victims RRR (95% CI)	Cyber victims RRR (95% CI)	Traditional-cyber victims RRR (95% CI)
Individual factors			
Age	0.85*** (0.79–0.91)	1.04 (0.85–1.28)	0.84** (0.74–0.96)
Male	1.28* (1.05–1.55)	0.90 (0.54–1.50)	2.60*** (1.89–3.57)
Race			
Black	0.65** (0.49–0.87)	0.57 (0.19–1.70)	0.27*** (0.16–0.46)
Hispanic	0.64*** (0.50–0.82)	0.73 (0.32–1.66)	0.44*** (0.27–0.71)
Other	0.45*** (0.29–0.67)	1.86* (1.01–3.42)	0.52* (0.30–0.88)
Academic achievement	0.82** (0.73–0.93)	0.91 (0.66–1.25)	0.72** (0.58–0.89)
Extracurricular activities	1.16*** (1.08–1.26)	1.17^{+} (0.97–1.42)	1.29*** (1.13–1.47)
Externalizing behavior			
Weapon carrying	1.27 (0.71–2.26)	1.54 (0.91–2.61)	2.28* (1.21–4.28)
Physical fighting	5.26*** (3.30–8.39)	1.54 (0.34–6.91)	6.56*** (3.25–13.25)
School truancy	1.57* (1.09–2.27)	1.20 (0.49–2.94)	1.53 (0.83–2.82)
Internalizing behavior			
Avoidance behavior	3.01*** (2.05–4.42)	2.56 (0.97–6.77)	4.89*** (2.97–8.07)
Fear of harm	3.13*** (1.92–5.09)	1.28 (0.28–5.79)	3.19*** (1.59–6.40)
Other victimization			
Criminal victimization	4.37*** (2.27–8.40)	2.80 (0.66–11.96)	5.09*** (2.20–11.76)
Hate-crime victimization	9.20*** (6.35–13.33)	3.10* (1.06–9.08)	18.47*** (11.82–28.87)
Family factors			
Household urbanicity			
Suburban	0.93 (0.74–1.16)	1.45 (0.83–2.53)	0.89 (0.59–1.33)
Rural	1.00 (0.76–1.31)	0.97 (0.47–2.00)	0.76 (0.45–1.31)
Household income	1.00 (0.99–1.00)	1.00 (0.99–1.00)	1.00 (0.99–1.00)
Family structure	1.22 (0.99–1.50)	1.25 (0.74–2.10)	1.25 (0.92–1.70)
Family SES	1.06* (1.00–1.13)	1.14 (0.98–1.33)	1.03 (0.92–1.14)
Peer factors			
Peer support	1.09 (0.93–1.27)	1.06 (0.65–1.73)	0.90 (0.68–1.20)
Peer weapon carrying	1.64 (0.99–2.72)	0.42 (0.05–3.27)	3.39*** (1.77–6.32)
Peer drug use	2.27*** (1.80–2.86)	3.02*** (1.87–4.86)	3.83*** (2.63–5.59)
School factors			
School sector	0.72 (0.51–1.02)	1.33 (0.44–4.02)	0.52 (0.23–1.16)
School level			
Middle school	0.76 (0.55–1.03)	1.39 (0.31–6.21)	1.27 (0.61–2.63)
High school	0.59** (0.41–0.85)	1.06 (0.24–4.56)	0.92 (0.42–1.99)
School gangs	1.21 (0.91–1.61)	1.14 (0.60–2.17)	1.46 (0.95–2.26)
School drugs	1.02 (0.98–1.07)	1.07 (0.97–1.18)	1.07* (1.01–1.13)
School safety	1.00 (0.94–1.06)	0.88 (0.74–1.06)	1.06 (0.94–1.19)
School rules	0.80*** (0.72–0.89)	0.87 (0.69–1.09)	0.73*** (0.62–0.86)
Teacher attitudes	1.13 (0.49–2.62)	0.66 (0.14–3.07)	0.87 (0.30–2.58)

$N = 4942$

RRR relative risk ratio. Reference group = Not bullied. All values reported are weighted

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

In addition, most individual factors were significantly related to both traditional victims and traditional-cyber victims, with similar patterns emerging. Specifically, compared to noninvolved peers, one year increases in age significantly decreased the odds of being involved as traditional victims by 15% and traditional-cyber victims by 16%. It was more likely for boys than for girls to be a traditional victim (RRR = 1.28) or traditional-cyber victim (RRR = 2.60). The odds of being traditional victims decreased by 35% for Black students, and by 36% for Hispanic students. The likelihood of being involved as traditional-cyber victims decreased by 73% for Black students, and by 56% for Hispanic students. Regarding academic achievement, each additional letter grade decreased the likelihood of being traditional victims by 18% and the odds of being traditional-cyber victims by 28%.

In addition, students who engaged in extracurricular activities were more likely to be traditional victims (RRR = 1.16) or traditional-cyber victims (RRR = 1.29). Students who were involved in physical fighting were over five times more likely to experience traditional bullying victimization and more than six times likely to experience traditional-cyberbullying victimization. Regarding internalizing behaviors, the likelihood of being traditional victims or traditional-cyber victims was greater for students who were involved in avoidance behaviors (traditional: RRR = 3.01; traditional-cyber: RRR = 4.89) and for students who were afraid of being attacked at school or on the way to and from school (traditional: RRR = 3.13; traditional-cyber: RRR = 3.19). In addition, students who experienced criminal victimization were over four times more likely to be traditional victims and about five times more likely to be traditional-cyber victims. Overall, traditional-cyber victims had stronger associations with significant individual factors mentioned above relative to traditional victims.

The remaining significant individual factors were found to be specific only for one form of bullying victimization. Specifically, school truancy was only significantly associated with the likelihood of being traditional victims. Students who had skipped class or school were about two times more likely to be victims of traditional bullying. However, weapon carrying was only related to likelihood of having experienced traditional-cyberbullying victimization: students who had ever carried a weapon to the school were over two times more likely to be traditional-cyber victims.

Considering family factors, only family SES was significantly associated with the likelihood of being traditional victims. As the socioeconomic level increased, the odds of being traditional victims increased as compared to noninvolved peers (RRR = 1.06). Given peer factors, students who perceived that other students were on drugs/alcohol while at school were more likely to be traditional victims, cyber victims, and traditional-cyber victims than noninvolved peers. Particularly, traditional-cyber victims had the strongest association with peer drug use (RRR = 3.83), followed by cyber victims (RRR = 3.02), and finally traditional victims (RRR = 2.27). However, peer support was not significantly related to any forms of bullying victimization. Students who reported knowing other students carrying a gun to the school were over three times more likely to be involved as traditional-cyber victims.

As for school factors, high school students were 41% less likely than elementary students to be involved in traditional bullying victimization only as compared to noninvolved peers. Students who reported more drugs were available at school were more likely to be traditional-cyber victims (RRR = 1.07). In addition, the factor of school rules was significantly related to being either traditional victims or traditional-cyber victims, with similar patterns emerging. Students who perceived that school rules were strictly enforced were 20% and 27% less likely to experience traditional victimization only and traditional-cyber victimization. Other school factors were not significantly associated with any forms of bullying victimization.

Discussion

This study aims to illustrate patterns of concurrence of traditional bullying and cyberbullying victimization and to identify shared and unique factors creating risk profiles of victims who experience one or both types of victimization within the social-ecological framework. The results indicated that traditional bullying victimization only was the most prevalent type of victimization followed by traditional-cyberbullying victimization and finally cyberbullying victimization only, which was consistent with the study by Beltrán-Catalán et al. (2018) of Spanish adolescents. The fact that a similar pattern regarding the prevalence of traditional, cyber, and mixed victims also emerged in a sample from the U.S. suggests the possibility of multi-cultural generalizability in bullying victimization. In addition, victims of traditional bullying had a much higher likelihood of being involved in cyberbullying victimization compared to students who were not involved in traditional bullying victimization. It was highly possible that bullying victimization occurring in cyberspace was an extension of traditional bullying victimization at school. This result confirmed previous studies concerning an overlap between traditional bullying and cyberbullying, in which victims of cyberbullying were often also victims of traditional bullying (Hinduja and Patchin 2012). Overall, these findings suggest the possibility that cyberbullying is another form of traditional bullying rather than a distinct phenomenon.

In addition, there were important relationships between social-ecological contexts and bullying victimization, which were dependent upon whether bullying victimization was offline, online, or both. Shared and unique patterns of being bullied offline, online, or both were determined and identified. The results demonstrated that different forms of bullying victimization might result from a common etiology, in which there were some shared predictors of all forms of bullying victimization.

Specifically, hate-crime victimization appeared to be a common experience for all types of bullying victims. Kochenderfer-Ladd (2003) has suggested that victimized students might be trapped in a dilemma of repeated victimization, in which they might encounter distinct forms of attacks repeatedly from different people. Students who perceived peers using drugs/alcohol at school were also at an increased risk for the three forms of bullying victimization. This might be explained by the reason that students who were sure that other students were on drugs/alcohol while at school were more likely to interact with these students. Deviant peer affiliation seemed related to an increased likelihood of exposure to delinquency, which placed individuals at high risk for victimization (Kowalski et al. 2014). Interestingly, compared to Whites, students from other racial backgrounds were less likely to be traditional victims and traditional-cyber victims, but were more likely to be cyber victims. This was consistent with the results from the study of Wang et al. (2009).

Although there was a high overlap between traditional victims and cyber victims, cyberbullying victimization was not just a "new bottle but old wine" as suggested by Li (2007). Many studied factors were associated with pure traditional victims and traditional-cyber victims with similar patterns emerged. More specifically, compared to noninvolved peers, traditional victims and traditional-cyber victims tended to be younger, male, and White students who reported lower academic performance, who engaged in more extracurricular activities, physical fighting, and avoidance behaviors, who were afraid of being attacked at school, and who experienced criminal victimization. In addition, rules enforced at school emerged as an issue specifically for students who were traditional victims and traditional-cyber victims. Not surprisingly, the less clear, consistent, fair, and strict rules were chosen to be enforced, the more the issues of bullying victimization emerged at school.

In contrast, none of these factors were significantly associated with pure cyber victims. This reflected a quite distinct nature of cyber victims compared with traditional victims and even traditional-cyber victims. Notably, it appeared that traditional-cyber victims shared similar demographics, lifestyles, personal experiences, and responding behaviors, particularly at individual level, with traditional victims. Furthermore, when preventing and intervening in bullying victimization, special attention may be paid to traditional-cyber victims as they had greater academic, externalizing and internalizing problems than traditional victims.

Despite these commonalities, several unique predictors were observed that distinguished between traditional victims, cyber victims, and traditional-cyber victims. They were found to be specific only for one form of bullying victimization. Particularly, students who carried at least a weapon, reported more drugs were available at school and perceived other students carrying a gun to the school tended to be traditional-cyber victims. Compared to noninvolved peers, traditional victims were more likely to come from the families with higher SES and skip class or school and were less likely to be high school students. There were no unique factors observed for cyberbullying victimization only, which suggests that cyberbullying victimization might be not just another form of traditional bullying victimization but a quite distinct phenomenon.

Most of characteristics regarding family background, such as household urbanicity, household income, and family structure, were not significantly related to any forms of bullying victimization. Surprisingly, there were no significant relationships between peer support and any forms of bullying victimization. It was possible that students didn't discuss the experiences of bullying victimization with their friends at school and therefore obtained less support when such experiences occurred. However, it was difficult to explore such a possibility since that no relevant information could be used in the current data. Notably, school factors were not significantly related to the risk of being victims of cyberbullying. Even more, school sector, the presence of gangs at school, measures implemented for school safety, and teacher attitudes were not significant predictors of any types of bullying victims.

Overall, the findings of the current study indicated that certain individual, family, peer, and school factors contributed differentially to the likelihood of being bullied offline, online, and both. The social-ecological theory might not work similarly for explaining different forms of bullying victimization, especially for cyberbullying victimization. It is worth noting that the school factors (i.e., environment, rules, safety measures, or teacher attitudes) were less related to cyberbullying victimization. Given that cyberbullying often occurs beyond school, school situations seem less likely to be related to the risk of being involved in cyberbullying victimization. Considering the unique characteristics of cyberspace, online contexts may need to be considered and included as an important ecology within the social-ecological theoretical framework. However, the online ecology was not explicitly examined in this study, suggesting further research is needed. Despite this, the findings emphasized the importance of designing and employing multifaceted approaches to intervene traditional victims and traditional-cyber victims. Dealing with the two forms of bullying victimization was relatively complex requiring the efforts at all social-ecological levels. Given the common and unique factors discussed above, both common and unique subcomponents may need to be included in intervention programs to address the incidents of traditional bullying and cyberbullying victimization.

Limitations and Future Directions

Although there were certain contributions to the literature on the co-occurrence of traditional bullying and cyberbullying victimization among adolescents, several limitations deserved additional caution. First, this study was cross-sectional, which was limited in its ability to decide temporal order of effects, make causal inferences and rule out the possibility of reverse causality on occurrence of traditional bullying victimization versus cyberbullying victimization. Future studies require longitudinal designs to examine the long-term effect of a variety of social-ecological factors on subsequent and dynamics of bullying victimization over the life course. Second, traditional bullying victimization was often constructed of physical, verbal, and relational forms. These forms of victimization might be different from each other and might also have different predictors themselves (Wang et al. 2009). As such, further comparisons of factors associated with victimization across physical, verbal, relational, and cyber forms need to be conducted in future research.

Third, the 2013 NCVS SCS dataset used in the current study were somewhat dated for considering bullying victimization in cyberspace, but still relevant. With the increased use of smartphone devices and smartwatch, the technologies used have changed significantly in the last six years in the adolescent population. As a result, the findings may not accurately reflect adolescents' cyberbullying victimization in the current form. For instance, the prevalence of adolescents being victimized in cyberspace may be significantly higher in the present as compared to six years ago. It should be acknowledged that the sample size for cyberbullying victimization was relatively small in the current study. Despite this, the present study can still build on existing literature, as social-ecological factors that are still relevant to the present-day have been examined. As such, further research using the most recent dataset may build on the present findings as a baseline to be compared and contrasted over time.

Fourth, some social-ecological constructs were measured by only single item or indicator, which only explained one aspect and didn't adequately assess the complexity of the specific construct, limiting its reliability and construct validity. Additionally, certain important aspects of social-ecological factors were not included since that relevant information was unavailable in the current data. Future studies are necessary to include a broader set of social-ecological factors with additional measures, such as school satisfaction, parenting practices, parent–child relationship, and neighborhood or community characteristics, that may work to either increase or decrease the risk of bullying victimization. Furthermore, cyberspace provides a unique and complex environment for the occurrence of cyberbullying, which needs to be included as an important ecology when examining cyberbullying victimization within the social-ecological theoretical framework. Thus, factors relevant to online contexts (e.g., frequency of internet use or online social network) need to be considered in future research. In sum, this study highlighted an imperative need for additional studies to investigate other potential social-ecological factors associated with the risk of being victims of bullying, both offline and online, which can contribute to developing effective intervention practices.

Implications of Practice

This study demonstrated that certain individual, family, peer, and school factors similarly or differentially contributed to the probability of being involved in traditional- and/or

cyber-bullying victimization, which might be informative for future intervention programs considering both unique and common strategies targeted for bullying victimization. Considering these findings, schools may have processes in place to identify and intervene in the lives of younger White male students who tend to be traditional victims and traditional-cyber victims. More specifically, sustained efforts may be taken to help students improve academic performance, since that better performance at school may protect students against being bullied. Additional strategies about discipline, monitoring, and supervision may be developed and implemented for students who are active in extracurricular activities, further protecting them from exposure to potential risks of violence.

Providing appropriate psychological treatments and coping strategies for students who have been engaging in physical fighting, experiencing criminal victimization, and taking avoidance behavior may further reduce the risk for being victimized. These students have high risk of being offline bullied at school and even higher risk for being involved in both online and offline victimization. Furthermore, psychological treatments for hate-crime victimization may be further developed as important components of assessment and intervention for all forms of bullying victimization. Overall, school psychologists, counselors, or social workers working with students may evaluate students' psychological health and behaviors or activities at school, and then design specific interventions targeted for traditional victims, cyber victims, and traditional-cyber victims and make adjustments in practices as they grow older.

Although peer support didn't appear to protect adolescents from bullying victimization, students who knew that other students used drugs/alcohol while at school were more likely to be traditional victims, cyber victims, and traditional-cyber victims. Not surprisingly, delinquent peer influences become far more significant in adolescence, when family influences are altered gradually such that parents are less likely to monitor their children and track their progress. However, the role of family, particularly about parenting and family cohesion, was not specifically tested in this study and their potential influences on bullying victimization were not clear. Since schools' influences on cyberbullying that occurs outside school can be quite limited, close cooperation with parents may be crucial.

Furthermore, there may be a need for schools to not only eliminate the influences of risk factors but also to develop intervention programs underlying the factors that work to protect students against bullying victimization. The findings underscored the protective effects of school rules toward students who were traditional victims and traditional-cyber victims. This suggests the importance for schools to foster a good school environment where clear, consistent, and fair school rules are strictly enforced, punishment for the violation is certain and fair, all students feel connected, feel cared for and respected by teachers or staff, and in which complaints of bullying are addressed.

In addition to the universal strategies that may be designed for victims of bullying, particularly for traditional victims and traditional-cyber victims, it appears that handling the problems of bullying victimization may require unique strategies that consider personal characteristics of adolescents in particular situations. As for traditional victims, attention may particularly be given to younger students who come from higher family SES and who would skip class or school. Current results also highlight the necessity for effective strategies or programs targeted for gun regulation and drug elimination at school to help to reduce the risk for being traditional-cyber victims. In addition, special attention may be paid to those students from other race, such as Asian, for addressing high risks of cyberbullying victimization. Notable, the implications of practice proposed here would need formal evaluation in future study.

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