

Original article

School Bullying Among Adolescents in the United States: Physical, Verbal, Relational, and Cyber

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Abstract

Purpose: Four forms of school bullying behaviors among US adolescents and their association with sociodemographic characteristics, parental support, and friends were examined.

Methods: Data were obtained from the Health Behavior in School-Aged Children (HBSC) 2005 Survey, a nationally representative sample of grades 6–10 ($N = 7,182$). The revised Olweus Bully/Victim Questionnaire was used to measure physical, verbal, and relational forms of bullying. Two items were added using the same format to measure cyber bullying. For each form, four categories were created: bully, victim, bully-victim, and not involved. Multinomial logistic regressions were applied, with sociodemographic variables, parental support, and number of friends as predictors.

Results: Prevalence rates of having bullied others or having been bullied at school for at least once in the last 2 months were 20.8% physically, 53.6% verbally, 51.4% socially, or 13.6% electronically. Boys were more involved in physical or verbal bullying, whereas girls were more involved in relational bullying. Boys were more likely to be cyber bullies, whereas girls were more likely to be cyber victims. African-American adolescents were involved in more bullying (physical, verbal, or cyber) but less victimization (verbal or relational). Higher parental support was associated with less involvement across all forms and classifications of bullying. Having more friends was associated with more bullying and less victimization for physical, verbal, and relational forms but was not associated with cyber bullying.

Conclusions: Parental support may protect adolescents from all four forms of bullying. Friends associate differentially with traditional and cyber bullying. Results indicate that cyber bullying is a distinct nature from that of traditional bullying. © 2009 Society for Adolescent Medicine. All rights reserved.

Keywords:

School bullying; Cyber bullying; Relational bullying; Parental support; Peers; Sociodemographic characteristics

School bullying has been identified as a problematic behavior among adolescents, affecting school achievement, prosocial skills, and psychological well-being for both victims and perpetrators [1–3]. Bullying is usually defined as a specific form of aggression, which is intentional, repeated, and involves a disparity of power between the victim and perpetrators [4]. Previous studies have found that boys have a higher prevalence of bullying perpetration than girls and bullying behavior tends to peak in middle school and then decrease [5]. In one of the few analyses of a nationally representative sample of adolescents in the United States, Nansel et al [6] reported that the prevalence

of frequent involvement in school bullying in the past 2 months was 29.9%, which included 13.0% as bullies, 10.6% as victims, and 6.3% as both. In the US sample, compared with Caucasian adolescents, Hispanic adolescents were involved in more frequent bullying perpetration, while African-American adolescents were less likely to be bullied.

Adolescent bullying may take many forms, such as physical [4], verbal [4], and relational or social [7]. Physical bullying (e.g., hitting, pushing, and kicking) and verbal bullying (e.g., name-calling and teasing in a hurtful way) are usually considered to be a direct form, while relational bullying refers to an indirect form of bullying, such as social exclusion and spreading rumors. Studies on direct and indirect bullying have consistently shown that boys are more involved in direct bullying, whereas girls are more involved in indirect bullying [8,9].

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As computers and cell phones are rapidly becoming popular among adolescents, *cyber bullying*, or electronic bullying, is emerging as a new form of bullying. Cyber bullying can be defined as a form of aggression that occurs through personal computers (e.g., e-mail and instant messaging) or cell phones (e.g., text messaging). Kowalski and Limber [10] reported that among their sample of 3,767 middle school students in the southwestern and northwestern United States, 22% reported involvement in cyber bullying, including 4% as bullies, 11% as victims, and 7% as both. There is also evidence showing that similar to traditional victimization, experiences with cyber victimization are associated with psychosocial problems such as emotional distress [11]. In a study of Canadian adolescents in 7th grade, boys were more likely to be cyber bullies than girls, and there was no gender difference in prevalence of victimization [12]. As investigation of cyber bullying is at an early stage, little is known about other demographic differences, such as age, racial, or SES differences in the prevalence of cyber bullying and victimization in the United States or in other countries.

Among a number of risk and protective factors, previous research indicates that parents and friends are two important sources of social influences associated with adolescent bullying and victimization. For example, previous studies showed that positive parental practices, such as parental warmth or support, could protect adolescents from involvement in both bullying perpetration [13] and victimization (i.e., being bullied) [14]. Compared with parents, friends seem to play a more mixed role: having more friends was found to be negatively related to victimization, suggesting a “friendship protection hypothesis” [11,15]; yet adolescents identified as bullies were found to be less socially isolated [16].

There is no doubt that parenting and friendships play important roles for understanding adolescent bullying. However, no studies have examined their roles across different forms of bullying, particularly cyber bullying. In addition, limited studies have been conducted nationally to provide a valid estimation of prevalence of physical, verbal, relational, and cyber bullying by adolescents’ gender, age, and race/ethnicity in the United States.

The current study examined four forms of in-school bullying, with two main purposes: (1) to explore gender, age, racial, and SES differences in prevalence of each form of bullying among adolescents in grades 6 through 10; and (2) to examine the roles of parental support and number of friends on each form. This study is among the first to examine the new form of bullying, cyber bullying, using a nationally representative sample of adolescents in the United States.

Method

Sample and procedure

Self-report data on bullying were collected from 7,508 adolescents in the 2005/2006 Health Behavior in School-aged Children (HBSC) study in the United States. HBSC is

a World Health Organization collaborative cross-national study examining health behaviors among children and their social determinants [17]. To obtain a nationally representative sample with controllable estimation errors, the US sampling design was a three-stage stratified design with an oversample of African-American and Hispanic students. The three stages were school districts, schools, and school classes. Stratification was conducted by nine strata of census regions and three strata of grades within each census region. The software used for the current study, the survey procedures of SAS version 9.1 [18], fully took into account this sampling design in the analyses.

Data were collected through anonymous self-report questionnaires distributed in the classroom in grades 6–10. Youth assent and parental consent were obtained as required by the participating school districts. The study protocol was reviewed and approved by the Institutional Review Board of the Eunice Kennedy Shriver National Institute of Child Health and Human Development. Information was obtained from 327 schools, of which 97 schools were identified as ineligible schools. Data was collected from students in the remaining 230 schools; 85% (9,016) of the eligible students participated in the HBSC study. The questionnaire containing the bullying items was given to approximately half of the students in grade 6 (randomly selected); therefore, a total of 7,508 students completed the HBSC questionnaire with the bullying items.

Measures

Sociodemographic variables. Gender was measured as male or female. Grade was measured with five levels, i.e., grades 6–10. As evidence shows that bullying behavior peaks in middle school, grade was collapsed into three categories: grade 6, grades 7 & 8, and grades 9 and 10. Race/ethnicity was collapsed into four categories: Caucasian, African-American, Hispanic, and other, as there was insufficient sample size for separate groups within other minorities. The family affluence scale (FAS), developed for HBSC, was used as the proxy for SES. The FAS consists of four items on family material wealth (i.e., having own bedroom, number of times on a traveling vacation in a year, number of home computers, and number of cars owned). This scale has shown desirable reliability and validity in previous studies [19]. The four items were combined to produce a linear composite score and standardized.

Bully/victim. The items assessing physical, verbal, and relational bullying were based on the revised Olweus Bully/Victim Questionnaire [20]. For each item, two parallel questions asked how often participants had either bullied others (bullying) or been bullied (victimization) in the past 2 months at school. Previous studies have reported a good reliability and validity [20]. Two new items were added using the same format to measure cyber bully/victim experience.

After given a standard definition of bullying, participants were asked how often they had bullied others or had been bullied at school in the past couple of months in a variety of different ways. Physical bullying was measured by one item (hitting, kicking, pushing, shoving around, or locking indoors). Verbal bullying was measured by three items (calling mean names, making fun of or teasing in a hurtful way, calling mean names about race, and calling mean names about religion). Relational bullying was measured by two items (socially excluding others, and spreading rumors). Cyber bullying was measured by two items (bullying using a computer or e-mail messages or pictures, and bullying using a cell phone).

Response options were none, only once or twice, 2 or 3 times a month, about once a week, and several times a week. A previous study recommended the cutoff point of “2 or 3 times a month” to code a student as involved or noninvolved [20]. However, as it is not uncommon in the literature of cyber bullying to count a single incident as an experience of cyber bullying [11,21], we chose the cutoff point of “only once or twice” for all items to make meaningful comparisons across the four forms. Participants were first coded as involved or not involved in each form for bullying or victimization. They were then categorized into one of four groups: involved in bullying others only (bullies), involved in being bullied only (victims), involved in both bullying others and being bullied (bully-victims), or not involved at all (noninvolved).

Parental support. Parental support was measured by four items from the Parental Bonding Instrument, which were included in the HBSC survey to measure parental support/warmth [22]. The students were asked if their parent or guardian 1) helps them as much as they needed; 2) is loving; 3) understands their problems and worries; and 4) makes them feel better when they were upset. Response options were almost never, sometimes, and almost always. The mean of the four items was calculated. Because the distribution was highly skewed, the variable was dichotomized around the mean into two categories: higher parental support and lower parental support.

Number of friends. Two items asked about how many male or female friends the student had. Response options ranged from 0 to 3 or more. Because a majority of the students reported 3 or more for both items, the sum was calculated and dichotomized into two categories (three or more friends, and fewer than three friends) for easier interpretation.

Statistical analysis

All analyses were conducted using SAS version 9.1, with adjustments for survey stratification, clustering, and weighting. For each form of bullying, analyses consisted of two steps: descriptive statistics and multinomial logistic regressions. Descriptive statistics were used to determine the

prevalence of involvement in bullying and being bullied, and the prevalence for each of the four bullying classifications. Multinomial logistic regression models were used to compare bullies, victims, and bully-victims with those who were never involved, in relation to parental support, friend group status, and sociodemographic variables. To determine whether parental support and number of friends were associated with each form of bullying differentially by gender, we included two interaction terms in each of the multinomial logistic regression models, i.e., interaction of gender with parental support, and interaction of gender with number of friends.

Results

Sample characteristics

Among the 7,508 adolescents who completed the survey with the bully/victim items, 326 were excluded because of missing information on variables included in the current study (4.3%: 1.0% missing on demographic variables, 2.1% missing on parental or peer variables, and additional 1.2% missing on bully-victim items), resulting in an analytic sample of 7,182 (95.7%). The sample consisted of 47.8% males, 42.6% Caucasian Americans, 18.2% African-Americans, and 26.4% Hispanic Americans. The mean age of the sample was 14.3 years with a standard deviation of 1.42.

Prevalence of bullying and victimization

The prevalence of bullying and victimization are reported in three ways: for each item (Table 1), for each form (physical, verbal, relational, cyber; Table 2), and for each bullying classification (bullies, victims, bully-victims, and noninvolved; Table 3).

At the item level, the two most common types of bullying behaviors were calling someone mean names and social isolation (Table 1). The two most common types of victimization were being called mean names and having rumors spread about them. It is interesting to note that the percentages of involvement in bullying and victimization are similar for most items, except for spreading rumors, in which much more victimization than bullying perpetration was reported.

Prevalence rates of bullying and victimization (Table 2) are given for the total sample, and across each category of parental support, number of friends, and the three demographic variables. In this sample, 13.3% reported that they had bullied others at least once in the last 2 months physically, 37.4% verbally, 27.2% socially, and 8.3% electronically. The prevalence rates of victimization in the last 2 months were 12.8% for physical, 36.5% for verbal, 41.0% for relational, and 9.8% for cyber forms.

When examining the combined measures of bullying and victimization, we found that the prevalence of involvement in bullying others, being bullied, or both, was 20.8% for physical, 53.6% for verbal, 51.4% for relational, and 13.6% for cyber (Table 3). Among those who were involved in physical

Table 1
Percentage of involvement by bullying assessment item

Forms	Items	Total (N = 7,182)		Male (N = 3,395)		Female (N = 3,787)	
		Bully	Victim	Bully	Victim	Bully	Victim
Physical	Hit, kicked, pushed, shoved around, or locked indoors	13.3	12.8	18.1	17.2	8.8	8.7
Verbal	Called mean names, was made fun of, or teased in a hurtful way	35.2	31.5	37.6	32.0	33.0	31.1
	Bullied with mean names and comments about race or color	9.1	13.1	12.0	15.2	6.5	11.3
	Bullied with mean names and comments about religion	5.8	8.5	8.4	9.7	3.3	7.5
Relational	Social isolation: excluded from a group of friends or was ignored	24.0	25.6	24.3	23.6	23.8	27.4
	Spreading rumor: told lies or spread false rumors	11.2	31.9	12.0	27.1	10.5	36.3
Cyber	Bullied using computer or e-mail messages or pictures	6.1	8.1	7.6	7.9	4.7	8.3
	Bullied using cell phone	6.0	5.7	7.0	5.6	5.0	5.8

bullying, 38.9% were bullies only (i.e., 601 of 1,594), 36.0% were victims only, and 26.3% were bully-victims. For verbal bullying, 30.3% were bullies only, 31.7% were victims only, and 38.1% were bully-victims. For relational bullying, 19.1% were bullies only, 48.1% were victims only, and 32.8% were bully-victims. For cyber bullying, 27.4% were bullies only, 40.0% were victims only, and 32.6% were bully-victims.

Multinomial logistic regressions

Multinomial logistic regressions were performed for each of the four forms of bullying: physical, verbal, relational, and cyber. In each of the four multinomial logistic regressions, the bullying classification was the outcome variable, with

noninvolved as the reference category, and with parental support, number of friends, and the demographic variables as predictors. The two interaction terms were not significant in any of the four regressions, indicating no gender differences in the influences of parental support and number of friends on adolescent bullying. Analyses were rerun by excluding the two interaction terms. The odds ratios and their corresponding 95% confidence intervals from the multivariate analyses are reported in Table 4.

Gender. Compared with girls, boys were likely to be more involved in physical (bullies, victims, or bully-victims) and verbal forms (bully-victims), but less involved in relational form (victims or bully-victims). For cyber bullying, boys

Table 2
Percentage of involvement in each form of bullying by gender, grade, race/ethnicity, parental support, and number of friends (N = 7,182)

Category	N (%)	Physical		Verbal		Relational		Cyber	
		Bully	Victim	Bully	Victim	Bully	Victim	Bully	Victim
Total	7,182 (100)	13.3	12.8	37.4	36.5	27.2	41.0	8.3	9.8
Gender									
Male	3,395 (47.8)	18.1	17.2	40.3	38.0	26.8	36.0	9.7	9.2
Female	3,787 (52.2)	8.8	8.7	34.7	35.2	27.5	45.6	7.1	10.3
Grade									
Grade 6	1,041 (10.3)	14.9	21.5	35.1	45.2	28.2	50.0	9.4	9.9
Grade 7	1,654 (20.9)	13.9	16.6	41.4	42.5	29.4	45.0	9.1	12.9
Grade 8	1,660 (21.5)	16.1	14.8	41.2	37.2	31.4	43.0	9.8	11.1
Grade 9	1,368 (24.9)	11.8	9.8	34.9	32.4	25.0	37.2	8.0	8.6
Grade 10	1,459 (22.5)	11.0	6.5	34.0	31.0	23.0	35.7	6.0	7.0
Race/ethnicity									
Caucasian	3,304 (42.6)	10.8	12.1	35.9	36.6	28.0	42.5	6.7	9.0
African- American	1,392 (18.2)	16.6	11.7	45.9	35.7	29.8	36.5	10.9	9.8
Hispanic	1,699 (26.4)	15.4	13.6	36.5	37.1	25.7	40.2	9.6	9.8
Other	787 (12.8)	12.3	14.6	32.2	36.3	23.7	44.4	7.3	12.7
Parental support	3,736 (53.0)	16.3	13.8	42.2	40.0	30.9	46.1	9.6	11.4
Lower									
Higher	3,446 (47.0)	9.9	11.6	32.0	33.1	23.0	35.3	6.8	8.1
No. of peers									
<3	2,781 (38.2)	11.2	14.0	35.9	41.5	25.7	46.2	7.6	10.0
≥3	4,404 (61.8)	14.6	12.0	36.4	33.5	28.1	37.8	8.7	9.6

Note: Family affluence scale (FAS) score was not included in this table because FAS was created as a standardized continuous variable in the current study.

Table 3
Percentage of bullies, victims, bully-victims, and individuals noninvolved in each form of bullying

Category	Total (N = 7,182)		Male (N = 3,395)		Female (N = 3,787)	
	N	%	N	%	N	%
Physical						
Involved	1,594	20.8	987	28.0	607	14.3
Bullies	601	8.1	366	10.9	235	5.6
Bully-victims	419	5.1	277	7.2	142	3.2
Victims	574	7.6	344	9.9	230	5.5
Noninvolved	5,588	79.1	2,408	71.9	3,180	85.7
Verbal						
Involved	3,917	53.6	1,904	55.7	2,013	51.8
Bullies	1,186	17.1	589	17.7	597	16.5
Bully-Victims	1,491	20.3	759	22.6	732	18.2
Victims	1,240	16.2	556	15.4	684	17.1
Noninvolved	3,265	46.3	1,491	44.3	1,774	48.2
Relational						
Involved	3,807	51.4	1,634	47.5	2,173	55.1
Bullies	727	10.4	388	11.4	339	9.5
Bully-Victims	1,249	16.7	515	15.4	734	18
Victims	1,831	24.3	731	20.7	1,100	27.6
Non-Involved	3,375	48.5	1,761	52.5	1,614	44.9
Cyber						
Involved	978	13.6	466	14	512	13.3
Bullies	268	3.8	155	4.8	113	2.9
Bully-Victims	319	4.5	160	4.9	159	4.2
Victims	391	5.3	151	4.3	240	6.2
Noninvolved	6,204	86.4	2,929	86	3,275	86.8

were more likely to be bullies, whereas girls were more likely to be victims.

Grade. For these analyses, adolescents in 6th grade were set as the reference group to test grade differences. There was no difference between 6th graders and 7th/8th graders on bullying perpetrations (bullies or bully-victims) in any of the four forms. However, 7th/8th graders were less likely to be victims for physical, verbal, and relational forms. Compared with 6th graders, 9th/10th graders were less involved in bullying for physical (bullies, victims, or bully-victims), verbal (victims or bully-victims), relational (victims or bully-victims), or cyber form (bullies).

Race/Ethnicity and FAS. Compared with Caucasian adolescents, African-American adolescents were more involved in bullying perpetration (physical, verbal, and cyber), but less involved in victimization (verbal and relational). Hispanic adolescents were more likely to be physical bullies or cyber bully-victims than Caucasian adolescents. Adolescents in the “other” race/ethnicity category were less likely to be relational bullies or verbal bully-victims, but more likely to be the targets of cyber bullying than Caucasian adolescents. Adolescents from more affluent families were less likely to be physical victims but more likely to be cyber victims.

Parental support. With the group reporting lower parental support as referent, all estimates of ORs for parental support were below 1.0, ranging from 0.50–0.90, indicating that

higher parental support was negatively associated with involvement in bullying across all four forms. With physical victims and cyber bully-victims as the exceptions, all other CIs were significant.

Number of friends. Number of friends was related to involvement in all three traditional forms, i.e., physical, verbal, and relational, but was not related to cyber bullying. For physical, verbal, and relational bullying, adolescents with more friends were more likely to be bullies, but less likely to be victims, and with the exception of physical bullying, they were also less likely to be bully-victims.

Discussion

Findings indicate high prevalence rates of having bullied others or having been bullied at school for at least once in the last 2 months: 20.8% physically, 53.6% verbally, 51.4% socially, or 13.6% electronically. After categorizing respondents into four categories (bullies, victims, bully-victims, and noninvolved), we found that adolescents with higher parental support reported less involvement in all four forms of bullying while having more friends was associated with more bullying (bullies) and less victimization (victims or bully-victims) in physical, verbal, and relational forms, but this was not the case for cyber bullying. Socio-demographic differences in bullying varied across the four different forms.

Consistent with previous studies [14], our results on parental support suggest that positive parental behaviors

Table 4

Relationship of sociodemographic characteristics, parental support, and number of friends with four forms of bullying using multinomial logistic regressions (N = 7,182)

Categories ^a	Physical		Verbal		Relational		Cyber	
	OR ^b	95% C. I.	OR	95% C. I.	OR	95% C. I.	OR	95% C. I.
Gender (Boy)								
Bully only	2.41	(1.91, 3.05)	1.19	[1.00, 1.43)	1.03	(0.82, 1.28)	1.73	(1.21, 2.45)
Bully-victim	2.86	(2.27, 3.60)	1.40	(1.19, 1.66)	0.73	(0.63, 0.86)	1.21	(0.93, 1.58)
Victim only	2.22	(1.76, 2.81)	1.00	(0.83, 1.20)	0.64	(0.56, 0.73)	0.71	(0.54, 0.93)
Grade (Grades 7, 8)								
Bully only	0.86	(0.61, 1.21)	1.24	(0.81, 1.89)	0.98	(0.64, 1.51)	0.78	(0.53, 1.15)
Bully-victim	0.94	(0.56, 1.58)	1.02	(0.74, 1.41)	0.86	(0.67, 1.09)	1.25	(0.79, 1.96)
Victim only	0.55	(0.41, 0.74)	0.67	(0.52, 0.87)	0.66	(0.53, 0.81)	1.14	(0.77, 1.67)
Grade (Grades 9, 10)								
Bully only	0.67	(0.47, 0.96)	0.92	(0.62, 1.36)	0.79	(0.52, 1.20)	0.66	(0.45, 0.97)
Bully-victim	0.46	(0.29, 0.74)	0.59	(0.43, 0.83)	0.48	(0.38, 0.60)	0.75	(0.48, 1.17)
Victim only	0.22	(0.16, 0.32)	0.43	(0.33, 0.57)	0.49	(0.40, 0.61)	0.69	(0.45, 1.08)
Race (African-American)								
Bully only	1.60	(1.05, 2.45)	1.52	(1.13, 2.03)	1.16	(0.90, 1.50)	1.74	(1.12, 2.70)
Bully-victim	1.24	(0.78, 1.97)	1.26	(0.99, 1.61)	0.83	(0.63, 1.09)	1.60	(0.90, 2.84)
Victim only	0.75	(0.53, 1.05)	0.77	(0.60, 0.99)	0.70	(0.56, 0.87)	0.79	(0.52, 1.21)
Race (Hispanic)								
Bully only	1.39	(1.03, 1.89)	1.05	(0.79, 1.39)	0.86	(0.68, 1.09)	1.32	(0.90, 1.92)
Bully-victim	1.31	(0.94, 1.84)	0.94	(0.77, 1.15)	0.79	(0.62, 1.02)	1.56	(1.14, 2.12)
Victim only	0.90	(0.71, 1.15)	1.01	(0.81, 1.27)	0.85	(0.71, 1.02)	0.79	(0.55, 1.13)
Race (Other)								
Bully only	1.22	(0.83, 1.82)	0.89	(0.66, 1.20)	0.65	(0.43, 0.98)	1.07	(0.62, 1.83)
Bully-victim	0.92	(0.53, 1.62)	0.78	(0.62, 0.97)	0.86	(0.65, 1.15)	1.13	(0.68, 1.88)
Victim only	1.28	(0.89, 1.84)	1.07	(0.81, 1.42)	1.04	(0.84, 1.30)	1.65	(1.10, 2.47)
FAS								
Bully only	0.88	(0.76, 1.03)	1.07	(0.97, 1.19)	1.16	(1.02, 1.31)	1.16	(0.99, 1.36)
Bully-victim	0.88	(0.76, 1.02)	0.96	(0.89, 1.05)	1.04	(0.95, 1.14)	0.98	(0.83, 1.15)
Victim only	0.85	(0.76, 0.96)	1.02	(0.95, 1.10)	1.06	(0.98, 1.13)	1.17	(1.02, 1.34)
Parental support (higher)								
Bully only	0.57	(0.46, 0.70)	0.57	(0.48, 0.68)	0.62	(0.50, 0.76)	0.54	(0.37, 0.78)
Bully-victim	0.52	(0.38, 0.69)	0.58	(0.48, 0.70)	0.49	(0.41, 0.60)	0.78	(0.55, 1.10)
Victim only	0.91	(0.70, 1.19)	0.69	(0.57, 0.85)	0.61	(0.52, 0.70)	0.55	(0.43, 0.72)
No. of friends (more)								
Bully only	1.64	(1.30, 2.07)	1.31	(1.07, 1.60)	1.49	(1.19, 1.86)	1.11	(0.79, 1.55)
Bully-victim	0.94	(0.76, 1.17)	0.79	(0.66, 0.95)	0.78	(0.67, 0.92)	1.09	(0.82, 1.47)
Victim only	0.78	(0.61, 0.99)	0.69	(0.57, 0.84)	0.72	(0.61, 0.85)	0.81	(0.60, 1.09)

FAS = family affluence scale.

Note: Boldfaced odds ratios and their 95% confidence intervals indicate that the confidence intervals exclude 1.0.

^a Reference groups for gender, grade, race/ethnicity, parental support and number of friends are female, grade 6, white American, lower parental support, and fewer friends, respectively.

^b Alpha of .05 is used as the significance level.

protect adolescents from not only bullying others but also being bullied. The protective effects were consistent for all four forms of bullying, with similar magnitudes of strength.

The negative relations between having more friends and victimization in physical, verbal, and relational forms supports the “friendship protection hypothesis” suggesting that friendship protects adolescents from being selected as targets of bullies [15,23]. The positive relation between having more friends and bullying in the three traditional forms is consistent with previously reported lower social isolation in bullies [16]. This may reflect a need among adolescents to establish social status, especially during transition into a new group [5], and may explain the peaking of prevalence rates of bullying in all four forms during 7th grade or 8th grade, a period of transition to middle school (Table 2).

As previous studies found a high correlation between traditional forms of bullying and cyber bullying, some researchers have argued that cyber bullying is a “new bottle but old wine” [24]. However, our results show a quite different role played by friends on cyber bullying compared with three traditional forms of bullying. Unlike physical, verbal, or relational bullying, cyber bullying was not related to number of friends. This reflects a distinct nature of cyber bullying compared with traditional forms of bullying.

Our results show that boys and girls are aggressive in different ways; boys engage more in physical or verbal bullying, whereas girls use spreading rumors and social exclusion as bullying tactics. The gender differences in direct and indirect forms of bullying are consistent with previous studies [8,9].

Age differences were consistent across the three traditional forms of bullying. Compared with 6th graders, 7th/8th grades were less likely to be victims in all three traditional forms. Adolescents in 9th/10th grades reported lower frequencies of physical bullying and also less physical, verbal, and relational victimization. Cyber bullying did not vary by grade, with the only exception being that the proportion of bullies was lower for 9th/10th graders than 6th graders.

The racial differences in the three traditional forms of bullying were similar to previous studies [6]. We found that African-American adolescents were more likely to be bullies but less likely to be victims. Hispanic adolescents were more involved in physical bullying. Our results show that higher SES may protect adolescents from victimization physically, but increased the risk of involvement in both bullying and victimization electronically. This is likely due to greater availability of computers and cell phones for adolescents from wealthier families.

There were several limitations to this study. First, the cross-sectional nature of the survey limits the ability to make causal conclusions. Longitudinal studies are needed to confirm the predictive effects of parental support and number of friends on bullying. Second, all data were student self-report. Testing information from multiple sources is recommended for future studies. Third, we used a cutoff point for the variables of bullying and victimization and did not examine the frequency of involvement in both behaviors. However, the lower frequency of cyber bullying suggested dichotomous classifications as the most useful categorization. And this categorization allows us to further obtain four distinct groups: bullies, victims, bully-victims, and noninvolved. Last, we did not examine the association between cyber bullying and the traditional forms of bullying. Future studies are recommended on the relationship between cyber bullying and traditional bullying.

Nonetheless, this study extends the previous literature in at least four ways. First, we assessed cyber bullying among US adolescents using the same format as in the revised Olweus Bully/Victim Questionnaire, which has been used internationally to measure the traditional forms of bullying [20]. Even though the two items did not assess every mode of cyber bullying behavior, we included the two major electronic devices: computers and cell phones. Using equivalent time frame and response categories as the other bullying forms allowed us to make comparisons between cyber bullying and traditional forms of bullying. In a review on cyber bullying [21], a wide variation in the prevalence was observed in studies conducted in four different countries including the United States. For example, from findings of five studies conducted in the United States the prevalence rates of cyber bullying ranged from 6% to 42%. One of the reasons for the wide variation is the lack of a standard assessment format. Second, we examined the prevalence rates and correlates for four different forms of bullying behaviors: physical, verbal, relational, and cyber. Our results suggest the distinct natures of the four forms, especially between

the cyber form and the other three traditional forms, in terms of their relations with other variables. Third, we examined the co-occurrence of bullying and victimization within the same person. It is important to identify bully-victims as a distinct group; for example, only bully-victims showed gender differences in the verbal form of bullying. And last, we used a large-scale nationally representative sample with sufficient representation from multiple age and racial groups. In conclusion, our results confirmed the important roles of parental support and number of friends, and suggest that demographic characteristic as well as different forms of bullying should be considered when examining or planning interventions on adolescent bullying.

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