

# Cyberbullying, School Bullying, and Psychological Distress: A Regional Census of High School Students

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Recent national attention to several cases of suicide among youth victims of cyberbullying<sup>1,2</sup> has raised concerns about its prevalence and psychological impact. Most states now have legislation in place that requires schools to address electronic harassment in their antibullying policies,<sup>3</sup> yet schools lack information about cyberbullying correlates and consequences and how they may differ from those of school bullying. To inform schools' efforts, research is needed that examines the overlap between cyberbullying and school bullying and identifies which youths are targeted with either or both types of bullying. It is also necessary to understand whether the psychological correlates of cyberbullying are similar to those of school bullying and whether students targeted with both forms of bullying are at increased risk of psychological harm.

With reports indicating that 93% of teens are active users of the Internet and 75% own a cell phone, up from 45% in 2004,<sup>4</sup> there is great potential for cyberbullying among youths. Yet the extent of cyberbullying victimization and its prevalence relative to school bullying is unclear. Studies have found that anywhere from 9% to 40% of students are victims of cyberbullying,<sup>5-7</sup> and most suggest that online victimization is less prevalent than are school bullying and other forms of offline victimization.<sup>8,9</sup> Strikingly few reports provide information on youths' involvements in bullying both online and on school property.

Cyberbullying has several unique characteristics that distinguish it from school bullying. Electronic communications allow cyberbullying perpetrators to maintain anonymity and give them the capacity to post messages to a wide audience.<sup>10</sup> In addition, perpetrators may feel reduced responsibility and accountability when online compared with face-to-face situations.<sup>11,12</sup> These features suggest that youths who may not be vulnerable to school bullying could, in fact, be targeted online through covert methods. The limited number of studies that

**Objectives.** Using data from a regional census of high school students, we have documented the prevalence of cyberbullying and school bullying victimization and their associations with psychological distress.

**Methods.** In the fall of 2008, 20 406 ninth- through twelfth-grade students in MetroWest Massachusetts completed surveys assessing their bullying victimization and psychological distress, including depressive symptoms, self-injury, and suicidality.

**Results.** A total of 15.8% of students reported cyberbullying and 25.9% reported school bullying in the past 12 months. A majority (59.7%) of cyberbullying victims were also school bullying victims; 36.3% of school bullying victims were also cyberbullying victims. Victimization was higher among nonheterosexually identified youths. Victims report lower school performance and school attachment. Controlled analyses indicated that distress was highest among victims of both cyberbullying and school bullying (adjusted odds ratios [AORs] were from 4.38 for depressive symptoms to 5.35 for suicide attempts requiring medical treatment). Victims of either form of bullying alone also reported elevated levels of distress.

**Conclusions.** Our findings confirm the need for prevention efforts that address both forms of bullying and their relation to school performance and mental health. (*Am J Public Health.* 2012;102:171-177. doi:10.2105/AJPH.2011.300308)

address the overlap between school and cyberbullying victimization has wide variation in findings, indicating that anywhere from about one third to more than three quarters of youths bullied online are also bullied at school.<sup>11,13,14</sup>

The distinct features of cyberbullying have led to questions about the sociodemographic characteristics of cyberbullying victims compared with those of school bullying victims. Although numerous studies of school bullying have found that boys are more likely to be victims,<sup>15,16</sup> the extent of gender differences in cyberbullying is unclear.<sup>5</sup> Some studies have found that girls are more likely to be victims of cyberbullying,<sup>9,10</sup> yet other studies have found no gender differences.<sup>8,17,18</sup> Age is another characteristic in which cyberbullying patterns may differ from traditional bullying. Although there is a decreasing prevalence of traditional bullying from middle to high school,<sup>16</sup> some studies suggest that cyberbullying victimization increases during the middle school years,<sup>8,10</sup> and others have found no consistent relationship between cyberbullying

and age.<sup>11,19</sup> Sexual orientation has been consistently linked with traditional bullying.<sup>20-22</sup> Despite recent media attention to cases of suicide among sexual minority youths who have been cyberbullied,<sup>23</sup> accounts of the relationship between cyberbullying and sexual orientation are primarily anecdotal, with little documentation of the extent to which nonheterosexual youths are victimized. The wide range of definitions and time frames used to assess cyberbullying complicates the comparison of the prevalence and correlates of cyberbullying across studies, and rapid advances in communications technology render it difficult to establish a comprehensive and static definition. Furthermore, there is wide variation in the age and other demographic characteristics of the samples, with many studies employing small, nonrepresentative samples.

In addition to comparing the sociodemographics of cyberbullying victims with those of school bullying victims, it is important to understand whether cyberbullying is linked with

negative school experiences, as is the case with school bullying. School bullying is widely known to be associated with many negative indicators, including lower academic achievement, lower school satisfaction, and lower levels of attachment and commitment to school, known as school bonding.<sup>24,25</sup> Because most cyberbullying occurs outside school,<sup>19,26</sup> it is uncertain whether a similar relationship exists for cyberbullying. A few studies have linked cyberbullying to negative school experiences, such as lower academic performance<sup>27</sup> and negative perceptions of school climate.<sup>8</sup> Although these studies suggest that cyberbullying may be a contributing factor, more research is needed to determine the extent to which school attachment and performance are related to cyberbullying experiences.

The known link between school bullying and psychological harm, including depression and suicidality<sup>28-31</sup> has also raised concerns about how cyberbullying is related to various forms of psychological distress. An emerging body of research has begun to identify psychological correlates of cyberbullying that are similar to the consequences of traditional bullying, including increased anxiety and emotional distress.<sup>6,11,32</sup> There are also reports that online victimization may be linked with more serious distress, including major depression,<sup>33,34</sup> self-harm, and suicide.<sup>31,35,36</sup> Although studies consistently identify a relationship between cyberbullying and psychological distress, it is not known whether reports of psychological distress are similar among cyberbullying and school bullying victims or what levels of distress are experienced by those who report being victimized both online and at school.

In this study, we used data collected from more than 20 000 students from the second wave of the MetroWest Adolescent Health Survey to examine patterns and correlates of bullying victimization. We first examined the prevalence of cyberbullying and school bullying and the degree of overlap between the 2 forms of victimization. Next, looking at youths who experienced cyberbullying only, school bullying only, or both types of bullying, we identified sociodemographic and individual-level school characteristics associated with each type of victimization. Finally, we analyzed the relationship between type of bullying victimization and multiple indicators of

psychological distress, ranging from depressive symptoms to suicide attempts.

## METHODS

The MetroWest Adolescent Health Survey is a biennial census survey of high school students in the western suburbs and small cities of the Boston metropolitan area that has the goal of monitoring trends to inform local and regional school and community policies and practices. The region is home to 26 high schools serving predominantly middle- and upper-middle class families. The survey employs a census rather than sampling procedure so that each district can monitor student behaviors and identify health issues that may vary by grade, gender, and other sociodemographic characteristics.

In fall 2008, 22 of 26 high schools in the region participated in the survey; these schools serve 86% of all public high school students in the region. Pencil and paper, anonymous surveys were conducted with all 9th- through 12th-grade students present on the day of administration. Parents and guardians were notified in advance and given the opportunity to view the survey and opt out their child(ren); students also provided assent. Youths ( $n=20\,406$ ) completed the surveys, for a participation rate of 88.1% (range, 75.2%–93.7%). Reflecting differences in school size, the number of students participating at each site ranged from 303 to 1815.

## Measures

To facilitate comparison with state and national data, most items in the MetroWest Adolescent Health Survey were drawn from the Centers for Disease Control and Prevention's Youth Risk Behavior Survey<sup>37</sup> and the Massachusetts Youth Risk Behavior Survey.<sup>38</sup>

**Bullying.** Students were asked about cyberbullying victimization and school bullying victimization in the past 12 months. Cyberbullying was measured with the following question: "How many times has someone used the Internet, a phone, or other electronic communications to bully, tease, or threaten you?" School bullying was measured by the following question: "During the past 12 months, how many times have you been bullied on school property?" with bullying defined as "being repeatedly teased, threatened, hit, kicked, or

excluded by another student or group of students." Responses from these 2 questions were categorically grouped into 4 categories of bullying victimization: cyberbullying victim only, school bullying victim only, both cyber and school bullying victim, and neither.

**Psychological distress.** Depressive symptoms, suicidal ideation (seriously considering suicide), and suicide attempts (any attempt and an attempt requiring medical treatment) were measured using items about behavior in the past 12 months.<sup>37</sup> Self-injury was assessed by the item "How many times did you hurt or injure yourself on purpose? (For example, by cutting, burning, or bruising yourself on purpose)."<sup>38</sup> Responses were dichotomized into yes or no categories.

**Sociodemographics.** Sociodemographic characteristics included gender, grade (9–12), race/ethnicity (Asian, African American or Black, Hispanic or Latino, Caucasian or White, or mixed or other), and sexual orientation (responses grouped as "heterosexually identified" vs "nonheterosexually identified," the latter of which encompassed gay or lesbian, bisexual, other, and not sure).

**Individual-level school characteristics.** School performance was measured through self-reported grades coded as "mostly As," "mostly Bs," "mostly Cs," and a combined category encompassing "mostly Ds," "mostly Fs," and ungraded or other. School attachment was measured using a 5-item scale from the National Longitudinal Study of Adolescent Health<sup>39</sup>; scale scores were divided into tertiles (low, medium, high).

**School size.** Schools were grouped into 3 categories on the basis of the size of student enrollment: <750 students, 750–1250 students, and >1250 students.

## Data Analysis

We generated descriptive statistics on the prevalence of bullying victimization and psychological distress. We used cross-tabulations to examine bivariate associations of victimization with sociodemographic (gender, grade, race/ethnicity, and sexual orientation), self-reported school performance, and school attachment and psychological distress indicators. We used binomial logistic regression analysis to examine the relationship between bullying victimization and psychological distress, adjusting for sociodemographics, school performance, school attachment, and school

enrollment size. Because of the large sample size, we used  $P$  values  $< .01$  and 99% confidence intervals (CIs) to identify statistical significance. School size was not associated with victimization or psychological distress indicators and was not included in final regression models. We used SPSS version 18.0 (SPSS, Inc., Chicago, IL) for all analyses.

## RESULTS

Table 1 presents the sociodemographic characteristics of participants. Three quarters (75.2%) of the youths were non-Hispanic White, consistent with regional demographics. About 6% of youths reported that they were gay or lesbian, bisexual, other, or not sure (nonheterosexually identified youths).

### Prevalence and Overlap of Cyberbullying and School Bullying Victimization

Overall, 15.8% of students reported cyberbullying, and 25.9% reported school bullying in the past 12 months. The overlap between cyberbullying and school bullying was substantial: 59.7% of cyberbullying victims were also school bullying victims, and 36.3% of school bullying victims were also cyberbullying victims. When categorized into 4 groups on the basis of reports of cyber and school bullying victimization, one third of all students were bullying victims: 6.4% were victims of cyberbullying only, 16.5% of students were victims of school bullying only, and 9.4% were victims of both school and cyberbullying.

### Correlates of Bullying Victimization

Regarding overall cyberbullying and school bullying victimization, reports of cyberbullying were higher among girls than among boys (18.3% vs 13.2%), whereas reports of school bullying were similar for both genders (25.1% for girls, 26.6% for boys). Although cyberbullying decreased slightly from 9th grade to 12th grade (from 17.2% to 13.4%), school bullying decreased by nearly half (from 32.5% to 17.8%). Nonheterosexually identified youths were far more likely than were heterosexually identified youths to report cyberbullying (33.1% vs 14.5%) and school bullying (42.3% vs 24.8%). There were no differences in overall reporting of cyberbullying or school bullying by race/ethnicity.

Table 2 displays the sociodemographic and individual-level school correlates of bullying victimization when categorized into the following 4 groups: cyberbullying victim only, school bullying victim only, both, and neither. Whereas there was little difference by gender, race/ethnicity, and grade, nonheterosexually identified youths were more likely to be victims of cyberbullying only, compared with those who self-identify as heterosexual (10.5% vs 6.0%). Youths who reported lower school performance and lower school attachment were also more likely to be victimized with cyberbullying only; for example, students who received mostly Ds and Fs were twice as likely to be cyber-only victims compared with students who received mostly As (11.3% vs 5.2%).

In contrast to reports of the cyber-only group, victimization on school property decreases substantially from 21.4% in 9th grade to 10.6% in 12th grade. There was little difference by gender or race/ethnicity. Consistent with the cyber-only group, nonheterosexually identified youths were at higher risk of school-only victimization (19.5% vs 16.3%); school-only victimization was also associated with lower school attachment.

Although there was little difference by gender for the other victimization groups, girls were more likely than were boys to be victims of both types of bullying (11.1% vs 7.6%). Like the cyber-only and school-only groups, sexual orientation was associated with reports of both cyber and school victimization; 22.7% of nonheterosexually identified youths were victims of both types of bullying compared with 8.5% of heterosexually identified youths. In addition, the associations between dual forms of victimization and school variables were stronger: students who received mostly Ds and Fs were more than twice as likely as were students who received mostly As to be victims of both forms of bullying (16.1% vs 7.4%), and students in the lowest school attachment tertile were nearly 3 times as likely to report both forms of victimization than were students in the highest tertile (14.9% vs 5.6%). Thus, youths who were in lower grades and nonheterosexually identified youths were more likely to be victims of one or both types of bullying, as were students who reported lower grades and lower levels of school attachment.

### Bullying Victimization and Psychological Distress

Table 3 presents bivariate associations between types of bullying victimization (cyber-only, school-only, both, or neither) and 5 indicators of psychological distress. Bullying victimization was consistently and robustly associated with an increased likelihood of psychological distress across all measures from depressive symptoms and suicidal ideation to reports of self-injury and suicide attempts. Furthermore, the relationship between victimization

**TABLE 1—Sociodemographics and School-Related Characteristics of Study Sample: MetroWest Adolescent Health Survey, Massachusetts, 2008**

Characteristics	No. (%)
<b>Sociodemographics</b>	
Gender	
Girl	10 218 (50.4)
Boy	10 050 (49.6)
Grade	
9th	5446 (26.8)
10th	5312 (26.2)
11th	5075 (25.0)
12th	4458 (22.0)
Race/ethnicity	
Asian	786 (3.9)
African American	564 (2.8)
Hispanic	1186 (5.8)
White	15 265 (75.2)
Mixed/other	2497 (12.3)
Sexual orientation	
Heterosexually identified	18 795 (93.7)
Nonheterosexually identified	1261 (6.3)
<b>School-related characteristics</b>	
Self-reported school performance	
Mostly As	6072 (31.0)
Mostly Bs	9947 (50.8)
Mostly Cs	2477 (12.6)
Mostly Ds or Fs	1090 (5.6)
Self-reported school attachment	
Highest tertile	7066 (35.1)
Medium tertile	5953 (29.6)
Lowest tertile	7095 (35.3)
School enrollment	
< 750 students	2402 (11.8)
750–1250 students	8576 (42.0)
> 1250 students	9428 (46.2)

**TABLE 2—Sociodemographic and Individual-Level School-Related Correlates of Bullying Victimization: MetroWest Adolescent Health Survey, Massachusetts, 2008**

Characteristics	Cyberbullying Victim Only, No. (%)	School Bullying Victim Only, No. (%)	Cyber and School Bullying Victim, No. (%)	Neither, No. (%)
<b>Sociodemographic correlates</b>				
Gender*				
Girl	723 (7.2)	1564 (15.5)	1118 (11.1)	6697 (66.3)
Boy	546 (5.6)	1718 (17.5)	751 (7.6)	6812 (69.3)
Grade*				
9th	327 (6.1)	1146 (21.4)	596 (11.1)	3293 (61.4)
10th	329 (6.3)	961 (18.4)	554 (10.6)	3376 (64.7)
11th	335 (6.7)	724 (14.5)	411 (8.2)	3529 (70.6)
12th	275 (6.3)	463 (10.6)	310 (7.1)	3324 (76.0)
Race/ethnicity*				
White	858 (5.7)	2474 (16.4)	1400 (9.3)	10 332 (68.6)
Non-White/mixed	413 (8.4)	822 (16.8)	481 (9.8)	3179 (64.9)
Sexual orientation*				
Heterosexually identified	1125 (6.0)	3046 (16.3)	1583 (8.5)	12 888 (69.1)
Nonheterosexually identified	131 (10.5)	243 (19.5)	282 (22.7)	589 (47.3)
<b>Individual-level school-related correlates</b>				
School performance*				
Mostly As	312 (5.2)	1002 (16.6)	448 (7.4)	4266 (70.8)
Mostly Bs	598 (6.1)	1642 (16.7)	896 (9.1)	6679 (68.0)
Mostly Cs	191 (8.0)	399 (16.6)	293 (12.2)	1516 (63.2)
Mostly Ds and Fs	117 (11.3)	145 (14.0)	167 (16.1)	606 (58.6)
School attachment*				
Highest tertile	364 (5.2)	891 (12.7)	393 (5.6)	5385 (76.6)
Medium tertile	348 (5.9)	965 (16.3)	435 (7.3)	4174 (70.5)
Lowest tertile	552 (7.9)	1442 (20.6)	1048 (14.9)	3974 (56.6)
Total	1275 (6.4)	3311 (16.5)	1889 (9.4)	13 582 (67.7)

Note. All measures are for the past 12 months.

\* $P < .001$  for association between bullying victimization and sociodemographic or student-level school correlate.

and distress was strongest among students who were victims of both cyber and school victimization, followed by victims of cyberbullying only and then victims of school bullying only. For example, reports of depressive symptoms were highest among victims of both cyber and school bullying (47.0%), followed by cyber-only victims (33.9%), and school-only victims (26.6%) compared with 13.6% of nonvictims. Similarly, attempted suicide was highest among victims of both cyber and school bullying (15.2%); however, it was also elevated among cyber-only victims (9.4%) and school-only victims (4.2%) compared with students reporting neither form of victimization (2.0%).

Table 4 displays logistic regressions modeling the relationship between type of bullying victimization and psychological distress, adjusting for the sociodemographic and

individual-level school variables identified earlier as significant correlates of victimization. Consistent with the bivariate associations, there were strong relationships between bullying victimization and psychological distress across all indicators of distress. Overall, the risks of experiencing psychological distress were greatest for victims of both cyber and school bullying. For example, compared with nonvictims, victims of both cyber and school bullying were more than 4 times as likely to report depressive symptoms (adjusted odds ratio [AOR]=4.38; 99% CI=3.76, 5.10), suicidal ideation (AOR=4.51; 99% CI=3.78, 5.39), and self-injury (AOR=4.79; 99% CI=4.06, 5.65), and more than 5 times as likely to report a suicide attempt (AOR=5.04; 99% CI=3.88, 6.55) and a suicide attempt requiring medical treatment (AOR=5.42;

99% CI=3.56, 8.26). Victims of cyberbullying only were also at a heightened, but somewhat lower risk of psychological distress (AORs from 2.59 to 3.44). The risk was still notable, but even lower, among victims of school bullying only (AORs from 1.51 to 2.20) compared with nonvictims.

## DISCUSSION

We examined data from a large, school-based census of more than 20 000 youths to document the co-occurrence of cyberbullying and school bullying and their association with psychological distress. We have provided evidence of a substantial overlap between cyberbullying and school bullying victimization and called attention to particularly vulnerable populations, including nonheterosexually



**TABLE 3—Psychological Correlates of Bullying Victimization: MetroWest Adolescent Health Survey, Massachusetts, 2008**

Bullying Victimization	Depressive Symptoms,* No. (%)	Suicidal Ideation,* No. (%)	Self-Injury,* No. (%)	Suicide Attempt,* No. (%)	Suicide Attempt With Medical Treatment,* No. (%)
Cyber victim only	429 (33.9)	228 (18.1)	305 (24.0)	119 (9.4)	42 (3.3)
School victim only	878 (26.6)	464 (14.1)	511 (15.5)	138 (4.2)	45 (1.4)
Both cyber and school victim	884 (47.0)	561 (30.0)	712 (37.8)	286 (15.2)	123 (6.6)
Neither	1839 (13.6)	836 (6.2)	1102 (8.1)	275 (2.0)	86 (0.6)
Total	4030 (20.2)	2089 (10.5)	2630 (13.2)	818 (4.1)	296 (1.5)

Note. All measures are for the past 12 months.

\* $P < .001$  for association between victimization and indicator of psychological distress.

identified youths. We also found an association between both types of bullying and indicators of school success. Finally, we have highlighted the relationship between victimization and psychological distress, documenting a substantially elevated risk of distress among victims of both cyber and school bullying. These findings show a clear need for prevention efforts that address both forms of victimization.

Although almost all states now mandate schools to address cyberbullying in their antibullying policies,<sup>3</sup> there is great flexibility in how much emphasis schools place on efforts to prevent cyberbullying, which occurs mostly outside school.<sup>19,26</sup> We found substantial overlap between cyberbullying and school bullying: nearly two thirds of all cyberbullying victims reported they were also bullied at school, and conversely, more than one third of school bullying victims also reported cyberbullying. This indicates the importance of prevention approaches that address both modes of victimization.

Another important reason for schools to address cyberbullying is the link between victimization and school attachment and self-reported school performance. This is true even for the 6% of students who were victimized only through cyberbullying. Although this cross-sectional survey cannot make attributions of causality, cyberbullying may be a contributing factor to negative school experiences, suggesting the need for schools to incorporate cyberbullying into their antibullying programs and policies. Efforts to increase student engagement in school, connectedness to peers and teachers, and academic success may also promote a climate in which school and cyberbullying are less likely to occur.

Our findings identified several groups that were particularly susceptible to victimization. It

is not surprising to learn that cyberbullying victimization and dual victimization were more prevalent among nonheterosexually identified youths, who are known to suffer from higher rates of victimization in school settings.<sup>20–22</sup> Nearly one quarter (23%) were victims of both cyber and school bullying, compared with only 9% of heterosexually identified youths. These disproportionate reports of bullying involvement, combined with the high prevalence of psychological distress among nonheterosexually identified youths,<sup>40</sup> show a clear need for antibullying programs and policies to address and protect students who identify as gay, lesbian, or bisexual or who may be questioning their sexual orientation. We also noted gender differences in victimization patterns. Girls were more likely than were boys to report cyberbullying, especially in combination with school bullying. Several other studies support the higher prevalence of cyberbullying victimization among girls.<sup>9,10</sup>

There is a robust relationship between cyberbullying victimization and all forms of psychological distress along the continuum from depression to suicide attempts. Importantly, whereas all 3 victim groups examined in this study reported elevated psychological distress, victims of cyberbullying alone reported more distress than did victims of school bullying alone. Moreover, the risk of psychological distress was most marked for victims of both cyber and school bullying, who were more than 4 times as likely to experience depressive symptoms and more than 5 times as likely to attempt suicide as were nonvictims. Our study not only provides further evidence of the link between cyberbullying and psychological distress<sup>30,34,36</sup> but also points to an even greater need to identify and support victims of both cyber and school bullying.

This study has several limitations. First, cyberbullying and school victimization were assessed using self-reported single items. There is no current consensus among researchers on how to measure cyberbullying, and the changing nature of communications technology makes it difficult to establish a fixed definition. In addition, some youths reporting both cyberbullying and school bullying may have answered positively to both questions because they were victims of cyberbullying that occurred on school property. The psychological distress indicators were also assessed using single self-report items; although these items are widely used, they are not diagnostic. The cross-sectional nature of the analysis means that we cannot attribute causality or temporality to the relation between bullying and distress. Furthermore, this study does not consider students' roles as perpetrators. These involvements may also be associated with increased psychological distress and negative school factors.<sup>41,42</sup> We also did not explore contextual influences on these behaviors and the complex roles that bystanders—students and parents and adults in the school community—play in escalating, condoning, tolerating, or preventing cyberbullying and school bullying. These are important areas for further research.

Despite these limitations, our study has several unique strengths. Many studies of cyberbullying are conducted online and, therefore, may have a bias toward the experiences of students who use the Internet more frequently. In fact, time spent online and computer proficiency have been related to cyberbullying behavior.<sup>17</sup> This school-based study included a more diverse group of students in terms of exposure to and use of electronic media. In addition, the sample size was large,

**TABLE 4—Associations of Bullying Victimization and Psychological Distress Among High School Students: MetroWest Adolescent Health Survey, Massachusetts, 2008**

Characteristics	Depressive Symptoms, No. or OR (95% CI)	Suicidal Ideation, No. or OR (95% CI)	Self-Injury, No. or OR (95% CI)	Suicide Attempt, No. or OR (95% CI)	Suicide Attempt With Medical Treatment, No. or OR (95% CI)
<b>Unadjusted</b>					
Students	19 990	19 953	19 975	19 988	19 877
Bullying victimization					
Cyber victim only	3.26 (2.76, 3.85)	3.35 (2.71, 4.13)	3.56 (2.95, 4.29)	5.00 (3.73, 6.71)	5.36 (3.28, 8.75)
School victim only	2.31 (2.04, 2.60)	2.49 (2.13, 2.92)	2.07 (1.78, 2.40)	2.11 (1.60, 2.77)	2.16 (1.34, 3.48)
Both cyber and school victim	5.64 (4.93, 6.46)	6.52 (5.56, 7.64)	6.86 (5.92, 7.94)	8.64 (6.88, 10.86)	10.93 (7.57, 15.80)
Neither (Ref)	1.00	1.00	1.00	1.00	1.00
<b>Adjusted</b>					
Students	18 815	18 784	18 796	18 812	18 735
Bullying victimization					
Cyber victim only	2.61 (2.17, 3.13)	2.59 (2.06, 3.25)	2.83 (2.30, 3.48)	3.44 (2.48, 4.76)	3.39 (1.99, 5.77)
School victim only	2.19 (1.92, 2.50)	2.20 (1.86, 2.62)	1.84 (1.57, 2.17)	1.63 (1.20, 2.20)	1.51 (0.89, 2.55)
Both cyber and school victim	4.38 (3.76, 5.10)	4.51 (3.78, 5.39)	4.79 (4.06, 5.65)	5.04 (3.88, 6.55)	5.42 (3.56, 8.26)
Neither (Ref)	1.00	1.00	1.00	1.00	1.00
Gender					
Girl	2.19 (1.97, 2.44)	1.59 (1.39, 1.82)	2.34 (2.05, 2.66)	1.29 (1.04, 1.59)	1.11 (0.79, 1.57)
Boy (Ref)	1.00	1.00	1.00	1.00	1.00
Grade					
9th	0.70 (0.60, 0.81)	0.76 (0.63, 0.93)	0.96 (0.80, 1.15)	1.04 (0.77, 1.42)	0.81 (0.50, 1.30)
10th	0.82 (0.71, 0.95)	0.92 (0.76, 1.11)	1.18 (0.98, 1.41)	1.06 (0.78, 1.44)	0.82 (0.51, 1.33)
11th	1.02 (0.88, 1.18)	0.93 (0.77, 1.13)	1.13 (0.94, 1.35)	1.05 (0.77, 1.44)	0.79 (0.48, 1.30)
12th (Ref)	1.00	1.00	1.00	1.00	1.00
Race/ethnicity					
White (Ref)	1.00	1.00	1.00	1.00	1.00
Non-White/mixed	1.25 (1.12, 1.41)	1.15 (0.99, 1.33)	1.02 (0.89, 1.18)	1.55 (1.25, 1.94)	1.38 (0.97, 1.98)
Sexual orientation					
Heterosexually identified (Ref)	1.00	1.00	1.00	1.00	1.00
Nonheterosexually identified	2.36 (1.97, 2.83)	3.43 (2.83, 4.16)	4.12 (3.42, 4.96)	5.17 (4.05, 6.60)	5.34 (3.69, 7.74)
School performance					
Mostly As (Ref)	1.00	1.00	1.00	1.00	1.00
Mostly Bs	1.44 (1.27, 1.63)	1.28 (1.09, 1.52)	1.27 (1.10, 1.48)	1.64 (1.22, 2.21)	1.21 (0.75, 1.96)
Mostly Cs	2.17 (1.83, 2.58)	1.70 (1.37, 2.12)	1.82 (1.49, 2.23)	2.79 (1.98, 3.94)	2.05 (1.19, 3.55)
Mostly Ds and Fs	2.71 (2.17, 3.38)	2.41 (1.85, 3.14)	2.28 (1.77, 2.94)	3.90 (2.67, 5.71)	3.31 (1.87, 5.87)
School attachment					
Highest tertile (Ref)	1.00	1.00	1.00	1.00	1.00
Medium tertile	1.23 (1.07, 1.43)	1.26 (1.03, 1.53)	1.18 (0.99, 1.40)	1.09 (0.78, 1.52)	0.98 (0.55, 1.75)
Lowest tertile	2.69 (2.36, 3.07)	2.50 (2.10, 2.98)	2.12 (1.81, 2.47)	2.09 (1.58, 2.77)	2.11 (1.33, 3.37)

Note. CI = confidence interval; OR = odds ratio. All measures are for the past 12 months.

permitting examination of behaviors within relatively small subgroups, such as nonheterosexually identified youths, and of infrequent forms of psychological distress, such as suicide attempts. At the same time, however, the results are regional, and generalizability to

other populations, including youths in urban and rural schools, may be limited.

In summary, our study provides a better understanding of cyberbullying and its relationship to school bullying, which is critical to informing school-based prevention efforts and engaging

parents and other community members in combating this significant public health issue. Our findings underscore the need for prevention efforts that address all forms of bullying victimization and their potential for harmful consequences both inside and outside school. ■

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## Contributors

S. Kessel Schneider conceptualized the study and led the analysis and writing of the article. L. O'Donnell and A. Stueve provided substantial contributions to the analysis and writing. R. W. S. Coulter assisted with data collection and analysis.

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## Human Participant Protection

The institutional review board of the Education Development Center, Waltham, MA, approved this study.

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