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Associations among bullying, cyberbullying, and suicide in high school students

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A B S T R A C T

This study examined associations among depression, suicidal behaviors, and bullying and victimization experiences in 1491 high school students using data from the 2009 Youth Risk Behavior Survey. Results demonstrated that depression mediated the association between bullying/victimization and suicide attempts, but differently for males and females. Specifically, depression mediated the link between traditional victimization and suicide attempts similarly across gender, whereas depression mediated the link between cyber victimization and suicide attempts only for females. Similarly, depression mediated the link between traditional bullying and suicide attempts for females only. Depression did not mediate the link between cyberbullying and suicide attempts for either gender. Implications of the findings are discussed, including the importance of greater detection of depression among students involved in bullying, and the need for a suicide prevention and intervention component in anti-bullying programs. Findings suggest that bullying prevention efforts be extended from middle school students to include high school students.

Youth suicide is a significant public health concern. It is the third leading cause of death among young people in the U.S. (Cash & Bridge, 2009; Steele & Doey, 2007): 13.8% of high school students reported seriously considering suicide and 6.3% reported attempting suicide at least once during the 12 months before the survey (Centers for Disease Control and Prevention (CDC), 2009). Involvement in bullying is associated with increased risk for suicide among young people (Kim, Leventhal, Koh, & Boyce, 2009). Bullying is intentionally harmful aggressive behavior that is repetitive and involves an imbalance of power between perpetrator and target (Nansel et al., 2001). Kim and Leventhal (2008) reviewed 37 studies and found a consistent association between being bullied and suicidal thoughts among youth. Furthermore, both perpetrators and targets of bullying are at higher risk of depression, suicide ideation, and suicide attempts than adolescents not involved in bullying (Klomek et al., 2007; Mills, Guerin, Lynch, Daly, & Fitzpatrick, 2004; Van der Wal, de Wit, & Hirasing, 2003).

Findings on associations among bullying, suicidal behaviors, and gender are mixed. Some studies showed that females involved in bullying as bullies, victims, or bullies/victims have significantly higher risks for suicidal behavior than students not involved in bullying (Kim, Koh, & Leventhal, 2005; Klomek et al., 2009). On the other hand, Klomek and colleagues found that males who were both bullies and victims had a higher likelihood of suicidal behavior than those who were not bullies or

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who were only victims of bullying. Others determined that suicidal ideation was most common among bullies–victims regardless of gender (Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999; Klomek et al., 2007).

Rapid advances in information and communication technology (ICT) have provided bullies with new tools. Aggression perpetrated using technology is usually called cyberbullying. While there is a growing body of research on cyberbullying (e.g., Bauman, 2009; Bauman & Pero, 2011; Burgess-Proctor, Hinduja, & Patchin, 2009; Smith et al., 2008), to date relatively little research has examined the association between cyberbullying and suicide. However, victims of cyberbullying may be at increased risk of suicide, even more so than victims of traditional bullying (Hinduja & Patchin, 2010).

Hinduja and Patchin (2010) explored the relationship between experiences with traditional and cyberbullying and suicidal behavior among middle school students. Their composite dependent variable (suicide ideation) included the item assessing depressive symptoms, along with suicidal thoughts, plans, and attempts. This seems to conflate depression and suicide. Although about 25% of persons with a major depressive disorder make a non-fatal suicide attempt at some point in their lifetimes, the vast majority of depressed individuals do not (Van Orden, Witte, Cukrowicz, Selby, & Joiner, 2010). That is, while depression is a risk factor for suicidal behaviors, it is not a feature of suicidal behavior, and including it in this variable confounds the issue.

Because depression is a known risk factor for suicidal behavior (Cash & Bridge, 2009), it is important to consider how it might be involved in the associations between bullying experiences and suicidal behaviors. Previous research has found associations between involvement in bullying and suicidal behavior, but the role of depression has been largely absent from the discussion. Understanding the process by which these variables are related would inform prevention and intervention efforts; suicidal behaviors might be prevented by targeting the intermediate psychological construct that accounts for the association (e.g., depression).

The current study is guided by the interpersonal theory of suicide (Van Orden et al., 2010) which posits that the desire for suicide is caused by the presence of both "thwarted belongingness" and "perceived burdensomeness" (p. 575). We consider bullying behaviors to be manifestations of thwarted belongingness in both the perpetrator and target of bullying. The perpetrator, whose behavior is motivated by the attempt to gain or maintain social status (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009), seeks belonging in the peer group. The target is the recipient of repeated actions that convey the message that he/she does not belong or is unwelcome in the peer group. Thus, involvement in bullying is a marker of the presence of some degree of thwarted belongingness, thus increasing the risk for suicidal behavior.

The current study also utilizes Beck's (1967) cognitive theory of depression. From this perspective, the thinking of the depressed person is characterized by a "cognitive triad" (e.g., Kaslow, Stark, Printa, Livington, & Tsai, 1992; Moss, 1992), which consists of negative views of self, the world, and the future. Being victimized may contribute to or magnify a negative view of self, as self-blame is often present in victimized youth (Graham & Juvonen, 1998). In addition, victimization may be interpreted as evidence of a cruel world in which persons intentionally harm others. Particularly if one has been victimized over a period of time and has been unable to stop the mistreatment, a grim view of the future ("this will never stop") may develop. Thus, we hypothesize that victimization leads to or exacerbates depression by contributing to the cognitive triad.

The current study extends the literature on associations between traditional bullying/cyberbullying and suicide in several ways. First, we examined these phenomena in a representative sample of high school students in one southwestern U.S. state. High school students are less often studied because bullying behaviors peak in middle school (e.g., Wang, Ianotti, & Nansel, 2009). Specifically, we examined whether bullying roles differed by gender, grade level, or race and ethnicity. Second, we explored the role of depression as a potential mediator of the association between bullying involvement and suicidal behavior to better understand the process by which involvement in bullying contributes to suicidal behavior. Using structural equation modeling, we examined the associations among depression, suicide attempts, and involvement in bullying, either as the cyber and/or traditional recipient or aggressor or both simultaneously, given that these behaviors do not occur in isolation. Further, given that others have found differences by gender in the associations among bullying involvement and suicidal behaviors, we examined whether the process was moderated by gender.

Methods

Participants

The sample comes from the 2009 Arizona Youth Risk Behavior Survey (YRBS) and included 1491 high school students (49% female) whose demographic characteristics are shown in Table 1. For analyses by race and ethnicity, small groups (Asian, Native Hawaiian, and Multiple – Non-Hispanic) were excluded and Hispanic/Latino and Multiple/Hispanic were combined into one category.

Measures

Items were selected from the 2009 YRBS, a component of the CDC's program to monitor health risk behaviors among youth. The surveys are administered biennially at national, state, and local schools to representative samples of students in grades 9–12 (CDC, 2004). The survey assesses the prevalence of health-risk behaviors and associated educational outcomes. The initial version of the questionnaire was developed in 1989, and after review and field-testing, was first administered in 1991. To determine reliability and validity of the survey, the 1999 version of the questionnaire was administered on two

Table 1
Demographic characteristics of the sample.

	Percent	*n*
Gender		
Female	48.9	725
Male	51.1	757
Missing		8
Grade		
9	26.1	386
10	25.7	379
11	24.0	354
12	23.9	353
Missing		12
Race/ethnicity		
American Indian/Alaska Native	5.6	81
Asian	1.7	25
Black or African American	4.4	64
Native Hawaiian/other Pacific Islander	.7	11
White	46.5	673
Hispanic/Latino	24.1	349
Multiple – Hispanic	14.4	208
Multiple – non-Hispanic	2.4	35
Missing		46

occasions two weeks apart to 4619 students. Twenty-two percent of items were found to have significantly different prevalence rates on the two administrations; ten of those items have kappa coefficients <61%. These items were then removed or revised for subsequent questionnaires. Validity studies in 2003 examined the extant empirical literature to identify cognitive and situational factors that might affect the validity of self-reports. In addition to possible influence by cognitive and situational factors, items also vary on the degree to which the behavior being assessed can be validated by external methods. Therefore, caution is advised when interpreting the data. States must use 66% of the questions from the standard YRBS questionnaire provided by CDC, have no more than 99 items, and response options must have no more than eight mutually exclusive choices. Optional questions are available from CDC.

For the present study, we used demographic variables, and all items related to depression, suicide, and bullying/electronic bullying (Appendix A). All depression and suicide variables were dichotomous (yes/no) in most analyses, but we retained the original ordinal variables (based on frequency of behaviors) when available for the correlation and mediation analyses.

Procedure

Two-stage cluster sampling was used to obtain representative samples of students in grades 9–12. In the first stage, public schools were selected with the probability of selection proportional to enrollment. In the second stage, classes were randomly selected from those either of a required subject, or from all intact classes during a required period. All students in the selected classes were eligible to participate. Local procedures for parental permission were followed. All surveys were self-administered during one class period. Students who were absent on the day of data collection were given an opportunity to take the survey at a later time. Data were weighted for states that document the sampling strategy and have an overall response rate ≥60%, including Arizona, so that weighted estimates are representative of high school students (Grades 9–12) in the state.

Data analysis

Normalized weights were created and applied prior to analysis (Hahs-Vaughn, 2005; Thomas & Heck, 2001). Following the guidelines provided by Thomas and Heck, we computed ICC statistics for all variables of interest. Because these rates were .000 for all variables, DEFF-adjusted weights were deemed unnecessary (personal correspondence with Ronald Heck, 2011) and therefore were not applied.

Consistent with the first goal of the study, variables were created to classify participants by bullying role: traditional victim, traditional bully, traditional bully/victim, cybervictim, cyberbully, cyberbully/victim, and uninvolved. An additional variable reflected the combination of categories: traditional victim only, cybervictim only, and dual victim, with comparable categories for bully and bully–victim status. Chi-square tests examined whether there were differences in these statuses based on gender, grade level, and race and ethnicity.

To assess the second goal of the study, whether depression acts as a mediator of the relationship between bullying involvement and suicide attempts, we used structural equation modeling in M*plus* (Muthén & Muthén, 2010). A variety of methods are available to test for mediation, but experts recommend bootstrapping, particularly when the variables are not normally distributed (Card, 2011; Preacher & Hayes, 2008), as is the case in this study. Bootstrapping estimates appropriate standard errors for path estimates and provides 95% bias-corrected confidence intervals for the effects in the model (Shrout &

Bolger, 2002). Further, given our moderated mediation research question, we examined our research question in a multiple group SEM by gender. To examine if the mediated pathways differed by gender, we used the Wald test of parameter constraints. A significant Wald test suggests that the groups vary on the pathway of interest, whereas a non-significant test suggests that the two groups have similar fit and therefore the collapsed estimate allows the most parsimonious model to be maintained.

A missing data analysis was conducted on the variables of interest. All variables except one had less than 1% missing data. For the "suicide attempts" item, 5.2% were missing. Because these rates of were quite low, no imputations were performed for the descriptive chi-square analyses. Two cases were deleted from further analysis because 75% of the data were missing. Full information maximum likelihood (FIML) was invoked in all structural equation models in M*plus* to correct for any remaining missing data (Schlomer, Bauman, & Card, 2010).

Results

Demographic differences

Gender

To examine gender differences in the dichotomous variables, chi-squared analyses were conducted. There was a significant association between gender and depression during the past year (χ^2 (df = 1) = 24.23, p = .0005), with females 1.73 times more likely to indicate they had been depressed than males. Similarly, there was a significant association between gender and considering suicide (χ^2 (df = 1) = 15.85, p = .0005), with females 1.73 times more likely to say they had considered suicide, 1.63 times more likely to report they had a suicide plan (χ^2 (df = 1) = 9.21, p = .002) and 1.47 times more likely to report at least one suicide attempt (χ^2 (df = 1) = 4.40, p = .04). Although no gender difference was detected on being victimized electronically at least weekly, a significant difference was found for cyberbullying (χ^2 (df = 1) = 11.22, p = .001), with males more than three times more likely to cyberbully others. Likewise, for traditional bullying/victimization, no difference was found for victimization, but males were 2.46 times more likely to bully others (χ^2 (df = 1) = 11.77, p = .001). Table 2 shows percentages of depression and suicidal behaviors by gender.

Grade level

There were no significant differences by grade for depression, considering suicide, or making a suicide plan. For attempting suicide, ninth graders were more likely to report at least one attempt than students in other grades (χ^2 (df = 3) = 7.92, p = .05) although Cramer's v = .08 indicated a weak relationship. On electronic victimization, students in 12th grade were most likely to report being victimized (χ^2 (df = 3) = 11.503, p = .009, Cramer's v = .09), and cyberbullying others (χ^2 (df = 3) = 9.13, p = .03, Cramer's v = .08). No grade differences were found for traditional bullying or victimization.

Bullying status

For traditional bullying, males were more likely to be classified as traditional bullies and bully–victims (χ^2 (df = 3) = 10.65, p = .01, Cramer's v = .09) and cyberbully/victims (χ^2 (df = 3) = 1113.92, p = .003, Cramer's v = .10). For the status groups, there was a moderate relationship where males were over-represented in the groups of cyberbully–victims and dual bully–victims (χ^2 (df = 3) = 28.34, p = .001, Cramer's v = .15).

No significant difference was found for traditional bullying status by grade. For cyberbullying status, 12th grade students were more likely to be cyberbully/victims (χ^2 (df = 9) = 21.48, p = .01, Cramer's v = .07) and were more likely to be dual bully–victims than students in other grades (χ^2 (df = 27) = 50.10, p = .004, Cramer's v = .11), also a moderate relationship.

Race/ethnicity

Analyses by race/ethnic category were conducted with the four groups that were large enough for analysis: American Indian, Black/African American, White, Hispanic or Mixed Hispanic (Bi-ethnic with Hispanic as one of the groups). These groups were statistically different on reported depression, (χ^2 (df = 3) = 12.54, p = .006, Cramer's v = .10), with Hispanics being most likely to report depression. No difference was found by race/ethnicity on the suicide variables. There was no difference by race/ethnicity for traditional victimization, while the Hispanic group was least likely to report bullying others (χ^2 (df = 3) = 8.98, p = .003, Cramer's v = .08). No differences were found for electronic bullying or victimization.

Table 2
Percentages of depression and suicidal behaviors in the sample by gender.

Survey item	Male	Female	Total
Depressed in previous year	29	41	35
Considered suicide	13	21	17
Made a suicide plan	9	14	12
Attempted suicide at least once	9	11	10

Correlations

To examine relationships among the independent variables, Pearson correlation coefficients were calculated. Because the sample size was large, all coefficients were statistically significant, but most were small in magnitude. The strongest relationship was between being depressed in the last year and considering suicide ($r = .403$). Among the bullying variables, being victimized by cyberbullying and cyberbullying others ($r = .548$) had the strongest relationship; traditional bullying and victimization were moderately correlated ($r = .348$). The relationships among the suicide variables and the bullying/victimization variables were not particularly strong (r's ranged from .15 to .26).

Mediation analyses

Our theoretical framework suggested that depression could be a mediator in the relation between bullying and victimization and suicide attempts. Thus, we examined whether depression mediated the association between traditional and cyber forms of bullying and victimization and suicidal behavior in a SEM. Importantly, traditional and cyber forms of bullying and victimization were entered simultaneously into the path model to examine their unique associations with depression and suicide attempts. Further, given the gender differences documented in the descriptive analyses, we compared the indirect paths by gender using the Wald test because the bootstrapping method does not provide a chi-square statistic that would allow for a more formal multiple-group test of gender moderation. The final path model is shown in Fig. 1. Findings by form of victimization and bullying are discussed separately below; in addition, depression significantly predicted suicide attempts for females ($\beta = .53$, $p < .001$) and males ($\beta = .47$, $p < .001$). Wald's test of significance suggested that this association was equal across gender (χ^2 (d$f = 1$) $= .50$, $p = .48$).

Traditional victimization

This was a significant predictor of depression for both females and males (Females: $\beta = .13$, $p < .01$; Males: $\beta = .20$, $p < .001$). Wald's test confirmed that this association could be constrained across gender (χ^2 (d$f = 1$) $= .73$, $p = .39$). Of note, even after accounting for depression, there was still a small direct significant association between traditional victimization and suicide attempts for females ($\beta = .10$, $p < .05$), but not for males ($\beta = .06$, $p > .05$). However, the Wald's test suggested that these parameters were not significantly different from one another (χ^2 (d$f = 1$) $= .55$, $p = .46$). Finally, the indirect effect was significant for females (a$\beta = .11$, 95% C.I. $= .04$–$.21$) and males (a$\beta = .13$, 95% C.I. $= .06$–$.21$), with the proportion of variance (as calculated by the formula aβ/c) in suicide attempts mediated by depression equal to 42.32% for females and 60.28% for males. Of note, the indirect path did not differ by gender: χ^2 (d$f = 1$) $= .11$, $p = .74$.

Traditional bullying

This was a significant predictor of depression for females ($\beta = .11$, $p < .05$), but not for males ($\beta = .01$, $p = .95$; Wald's statistic: χ^2 (d$f = 1$) $= 4.40$, $p < .05$). Further, the direct association between traditional bullying, and suicide attempt was not significant for females or males after accounting for depression. Finally, the indirect effect was significant for females (a$\beta = .10$, 95% C.I. $= .02$–$.20$), but not for males (a$\beta = .00$, 95% C.I. $= -.05$–$.06$). Further, Wald's statistic confirmed that the indirect effect

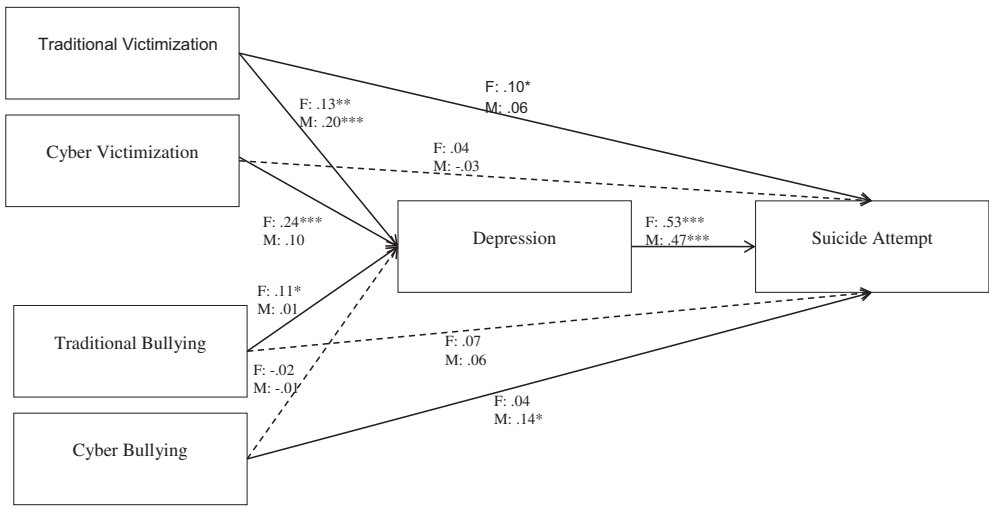

Fig. 1. Final path estimates for males and females. Note. Standardized coefficients are shown. F = females, M = males. Covariation among the predictors was modeled but is not shown here for brevity. Dashed lines represent non-significant pathways and solid lines represent significant pathways. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

was significantly different across gender (χ^2 (d$f = 1$) = 4.44, $p < .05$). The proportion of variance in suicide attempts mediated by depression was equal to 21.63% for females.

Cyber victimization

This was a significant predictor of depression for females ($\beta = .24$, $p < .001$), but not for males ($\beta = .10$, $p = .10$; Wald's statistic: χ^2 (d$f = 1$) = 6.76, $p < .01$). Further, the direct association between cyber victimization and suicide attempt was not significant for females or males after accounting for depression. Finally, the indirect effect was significant only for females (a$\beta = .23$, 95% C.I. = .13–.33), but not males (a$\beta = .07$, 95% C.I. = .00–.17). A Wald's test confirmed that these indirect effects were significantly different across gender (Wald's statistic: χ^2 (d$f = 1$) = 6.64, $p < .01$). The proportion of variance in suicide attempts mediated by depression was equal to 74.43% for females.

Cyberbullying

This was not a significant predictor of depression for either females or males (Wald's statistic: χ^2 (d$f = 1$) = .50, $p = .48$). After accounting for depression, there was a direct significant association between cyberbullying and suicide attempts, but only for males ($\beta = .14$, $p < .05$); however, a Wald's test suggested that males and females did not differ on this association (χ^2 (d$f = 1$) = 1.18, $p = .28$) The indirect effects were not significant for either females (a$\beta = -.18$, 95% C.I. = −.13–.11) or males (aβ = .00, 95% C.I. = −.09–.08); further, a Wald's test confirmed that these parameters did not differ by gender (χ^2 (d$f = 1$) = .07, $p = .80$).

Summary

To summarize, depression significantly mediated the relation between traditional bullying and suicide attempts for both females and males, with depression accounting for 42–60% of variance in suicide attempts, respectively. Further, depression significantly mediated the relation between traditional bullying and cyber victimization and suicide attempts for females only, with depression accounting for 21.63% of the variance in suicide attempts for traditional bullying and 74.43% for cyber victimization. Finally, depression did not mediate the association between cyberbullying and suicide attempts for males or females.

Discussion

This study is the first to examine the mediating role of depression in the relation between bullying and cyberbullying experiences and suicidal behaviors. Furthermore, we were able to quantify the magnitude of the mediation effect. This illuminates the process by which different experiences with bullying and cyberbullying are associated with suicide attempts. Different patterns by gender are notable: depression mediated the relation between traditional victimization and suicidal behavior for males and females, but this held for cyber victimization and traditional bullying only for females, with the largest proportion of variance in suicide attempts accounted for by depression found with cyber victimization for females. Findings suggest that some gender-specific strategies for prevention and intervention may be helpful. Further, this study extended the findings of Hinduja and Patchin (2010) to the high school population and provided information about the relations among the variables, including the presence of mediation and absence of moderation effects of depression. Most of our findings were consistent with the extant literature, but several findings were unique and somewhat anomalous.

Consistent with Hinduja and Patchin (2010), we found high school students' experiences with traditional bullying and cyberbullying were associated with suicidal behaviors. Their findings revealed that traditional bullying and victimization were stronger predictors of suicidal thoughts, plans, and attempts than cyberbullying and victimization. In contrast, we found that cyberbullying perpetration (not victimization) was a direct predictor of suicide attempts among males only. We speculate that for cyberbully perpetrators, a statement that was intended as a joke or that was misinterpreted might result in a situation which quickly escalates and involves multiple parties, leaving the cyberbully feeling guilty for initiating such an unintended spiral. Even if some harm might have been intended, the degree of harm incurred might not have been anticipated by the perpetrator (Baldasare, Bauman, Goldman, & Robie, 2012), and feelings of guilt may develop. Future research should replicate these findings, perhaps utilizing a mixed-methods approach in order to gain a deeper, more nuanced understanding of this anomaly, to include the voices of adolescents (Varjas, Talley, Meyers, Parris, & Cutts, 2010).

For females, cyber victimization was strongly related to depression, which in turn was associated with suicide attempts. Females are more prone to internalizing negative experiences, and males to externalizing (Rosenfeld, 2000). Females also scored higher on measures of the imaginary audience that is considered an expression of adolescent egocentrism (Greene, Robin, Hale, & Walters, 1996; Schonert-Reichl, 1994). Because many cyberbullying actions are attempts to publicly humiliate the target or damage her friendships and social status, the self-focus of the imaginary audience may magnify the belief that the entire social world in which the target interacts is aware of her humiliation, contributing to the development of depression.

We showed that depression mediated the relationship between being victimized by traditional bullying and suicide attempts, but only for females. Mediation describes the mechanism by which traditional bullying affects suicidal behavior, which is via depression. This finding supports and explains findings from other research which suggests that bullying behaviors in conjunction with depression or suicidality in high school portend a worse outcome than either depression or suicidality alone (Klomek, Sourander, & Gould, 2011). Our finding underscores the importance of detection of depression

among students involved in bullying as either perpetrator or victim. Likewise, students who are depressed should be queried about their involvement in bullying. If depression is treated, suicidal behavior may be prevented.

Our results also highlight the importance of the high school transition years. Our finding that incoming students (9th grade) were more likely than any other grade to report at least one suicide attempt in the past year highlights the stress some students experience as they transition from middle to high school. Suicide prevention efforts should address the incoming ninth grade students, and as early as possible in the freshman year, when the stress of the transition/assimilation process may be the greatest. Additionally, findings suggest there are unique stresses experienced by some outgoing twelfth grade students. Although the rate was low, we found that 12th grade students were more likely than any other grade to be involved in cyberbullying. This suggests that researchers, educators, counselors, and parents need to be aware that senior transition year is an additional stress period for some students. We speculate that this might be a transition phenomenon: As students approach leaving school and anticipate the transition to college or the job market, it may be that they begin to use cyber communication strategies more frequently as they anticipate the reduction of face-to-face interactions.

The strong correlation between being victimized by cyberbullying and cyberbullying others indicates that the dynamics of cyberbullying may be different from traditional bullying. Cyberbullying may be more of a reciprocal behavior and less about power differential. We speculate that this apparent reciprocal nature of cyberbullying, particularly among males, may be further evidence that some high school students view bullying as entertainment, "particularly when there was nothing much to do" (Guerra, Williams, & Sadek, 2011, p. 303) and "senioritis" sets in. In order to better understand the true nature of these behaviors, future research studies should include cyberbullying experiences among high school students. Likewise, cyberbullying prevention and intervention programs should not be limited to middle school students, but should be extended to include high school students.

Because our sample was high school students, we expected less bullying than in middle school, and indeed our rates were quite low. Those rates might also be the result of difficulty interpreting the terms "bullying" and "harassment." These terms may not resonate with older students. Baldasare et al. (2012) found that college students who were asked to describe their experiences affirmed that they had been harassed or victimized digitally, but they did not voluntarily use these terms to describe their experiences. In addition, single items were used to measure the constructs in this study. Prevalence might have been higher if behaviors had been listed without labeling them. While students might admit to engaging in certain behaviors online, they might not consider these behaviors to be bullying (Mishna, Cook, Gadalla, Daciuk, & Solomon, 2010).

Our study indicated that, generally, males were more engaged in bullying behaviors, either by traditional or electronic means, than were females. Males were more likely to be characterized as traditional bullies and also more likely to be dual bully–victims (both traditional and cyber). As dual bully–victims have been found to be the most at-risk group for depression, suicide ideation and attempts (Klomek et al., 2007; McKenna, Hawk, Mullen, & Hertz, 2011), it would behoove schools to consider the increased vulnerability of this group. Students who engage in these behaviors may have pre- or co-existing psychological vulnerabilities. Instead of treating these behaviors as discipline issues, it might be helpful to consider them in the context of broader mental health barriers to learning.

Implications for prevention and intervention

As a part of prevention and intervention efforts, many schools have "zero tolerance" policies for bullying and cyberbullying, even though zero tolerance has not been shown to improve school climate or school safety (American Psychological Association Zero Tolerance Task Force, 2008). Both our findings and those of Hinduja and Patchin (2010) indicate that bullies themselves may be at increased risk of suicidal ideation and/or attempts. Administrators and policymakers, therefore, may want to reconsider policies that place these students beyond the community of care of their educational setting. Instead, school administrators may wish to heed the growing call for a "restorative justice" and other non-punitive, problem-solving approaches for resolving bullying incidents (Bauman, 2011; Morrison, 2002, 2006; Suicide Prevention Resource Center [SPRC], 2011). It is not helpful to remove students who engage in bullying behaviors from the context in which the problem occurred, thus depriving them of the opportunity to learn new, more positive behaviors. Similarly, removing students from school, particularly if their support group is school-based, might contribute to their sense of isolation and deepen depression.

Our findings have implications for future prevention and intervention efforts and research. First, our finding that students who perpetrate bullying, whether traditional, cyber or both, are at risk for suicidal ideation and/or attempts, highlights the importance of programs addressing the needs and behaviors of *both* the bullies *and* the victims (Kaltiala-Heino et al., 1999). Second, while there is little research on how suicide prevention and bullying prevention programs might be used together (SPRC, 2011), we concur with others (Hinduja & Patchin, 2010; Klomek et al., 2011) who suggest that a suicide prevention and intervention component is essential within any comprehensive bullying program "to dissuade this form of harm and to remind youth that help is available" (Hinduja & Patchin, 2010, p. 217). Finally, the anomalies and unanswered questions in our findings support the need for future mixed-methods studies to enhance understanding of the complex dynamics of bullying and cyberbullying, particularly from the perspective of youth themselves (Guerra et al., 2011; Rivers & Noret, 2010).

Limitations

Our analyses were based on cross-sectional data gathered at one point in time rather than at multiple time-points. Therefore, we cannot conclude any causal relationship between bullying, cyberbullying, depression, and suicide. Future studies should utilize longitudinal data collection methods to establish casual connections. In addition, responses were self-

report, which may have caused some bias. Future studies might utilize additional forms of data collection obtained from peers, parents, and teachers (Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2008). Finally, although the use of single items to represent the construct under investigation is not best practice, it is widely used; such items were used in the most-frequently cited article on bullying (Nansel et al., 2001).

Conclusion

The findings presented here support the importance of greater detection of depression among students who are involved in bullying either as the perpetrator or the victim. Additionally, both bullies and victims – in some cases bullies more than victims – are at risk for depression and suicidal behaviors. Our findings point to the need for bullying prevention and intervention programs to include a suicide prevention and intervention component and to be extended to include high school students.

Appendix A

Items from Arizona Risk Behavior Survey (2009)

The next 5 questions ask about bullying. Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way.

24 During the past 12 months, how frequently have you been harassed or bullied **on school property**?
- A. Never
- B. Once or twice
- C. Monthly
- D. Weekly
- E. Daily

25 During the past 12 months, how frequently have you harassed or bullied someone else **on school property**?
- A. Never
- B. Once or twice
- C. Monthly
- D. Weekly
- E. Daily

26 During the past 12 months, how frequently have you been electronically bullied, such as through e-mail, chat rooms, instant messaging, web sites, or text messaging?
- A. Never
- B. Once or twice
- C. Monthly
- D. Weekly
- E. Daily

27 During the past 12 months, how frequently have you electronically bullied someone else, such as through e-mail, chat rooms, instant messaging, web sites, or text messaging?
- A. Never
- B. Once or twice
- C. Monthly
- D. Weekly
- E. Daily

The next 6 questions ask about sad feelings and attempted suicide. Sometimes people feel so depressed about the future that they may consider attempting suicide, that is, taking some action to end their own life.

29 During the past 12 months, did you ever feel so sad or hopeless almost every day for **two weeks or more in a row** that you stopped doing some usual activities?
- A. Yes
- B. No

30 During the past 12 months, did you ever **seriously** consider attempting suicide?
- A. Yes
- B. No

31 During the past 12 months, did you make a plan about how you would attempt suicide?
- A. Yes
- B. No

32 During the past 12 months, how many times did you actually attempt suicide?
A. 0 times
B. 1 time
C. 2 or 3 times
D. 4 or 5 times
E. 6 or more times

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