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# High school Bullying as a Risk for Later Depression and Suicidality

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# Abstract

This is the first study to examine whether high-school students experiencing frequent bullying behaviors are at risk for *later* depression and suicidality. 236 students who reported frequent bullying behavior without depression or suicidality during a suicide screening were interviewed four years later to reassess depression, suicidal ideation, attempts, substance problems, and functional impairment and were compared to "at-risk" youth identified during the screen, including 96 youth who also experienced bullying behavior. Youth who only reported frequent bullying behaviors (as bullies, victims or both) did not develop later depression or suicidality and continued to have fewer psychiatric problems than students identified as at-risk for suicide. Students who experienced bullying behaviors and depression or suicidality were more impaired four years later than those who had only reported depression or suicidality. Thus, assessment of bullying behaviors in screening protocols is recommended.

# Keywords

bullying; adolescents; suicide; high school

Bullying behavior is prevalent among youth (Wang et al., 2009) and appears to be linked to depression (Craig, 1998; Eisenberg et al., 2003; Fekkes et al., 2004; Herba et al., 2008; Ivarsson et al., 2005; Kaltiala-Heino et al., 1999, 2000; Klomek et al., 2007, 2008; Mills et al., 2004; Roland., 2002; Salmon et al., 1998; Seals & Young., 2003; van der Wal et al., 2003), suicidal ideation (Eisenberg et al., 2003; Ivarsson et al., 2005; Kaltiala-Heino et al., 1999; Kim et al., 2005; Klomek et al., 2007, 2008; Rigby & Slee, 1999; Roland., 2002; van der Wal et al., 2003) and suicide attempts (Cleary, 2000; Eisenberg et al., 2003; Ivarsson et al., 2005; Kaltiala-Heino et al., 1999; Kim et al., 2005; Kaltiala-Heino et al., 1999; Kim et al., 2005; Klomek et al., 2007, 2008; Mills et al., 2005; Kaltiala-Heino et al., 1999; Kim et al., 2005; Klomek et al., 2007, 2008; Mills et al., 2004) based on cross-sectional studies. These associations have been found in elementary school (Arseneault et al., 2006; 2008; Craig, 1998; van der Wal et al., 2003), middle school (Ivarsson et al., 2005; Kim et al., 2005; Ken et al., 2003) and high school students (Kaltiala-Heino et al., 1999; Klomek et al., 2007, 2008; Rigby &, Slee,

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1999). Significant interactions between gender and school bullying in the risk of depression and suicidal ideation have emerged in these cross-sectional studies, but the results are not consistent (Kaltiala-Heino et al., 1999, 2000; Kim et al., 2005; Rigby &, Slee, 1999; Roland, 2002; van der Wal et al., 2003). Our earlier research (Klomek et al., 2007) suggests that there is a different threshold at which bullying is associated with depression and suicidality among girls and boys. Girls who bullied others were at risk for depression, ideation, and attempts even when the bullying was infrequent. Among boys, however, only frequent bullying was associated with depression, ideation, and attempts. Our research suggests a different gender threshold in victimization as well. Among girls, victimization at any frequency increased the risk of depression, ideation, and attempts. Among boys, only frequent victimization increased the risk of depression and ideation, although infrequent victimization was associated with an increased risk of attempts.

These cross-sectional studies, while establishing useful associations, are unable to provide adequate evidence that bullying behaviors constitute anything more than correlates of depression and suicidality. Longitudinal studies are necessary to distinguish mere correlates from *predictive* risk factors of depression and suicidality. There have been few longitudinal studies of bullying behavior and later depression or suicidal ideation and behavior. A study of Norwegian youth (Olweus, 1992) reported that children identified as being seriously bullied at age 11 years suffered from "bouts of depression" as young adults. A follow-up study of young adolescents in Australia (Bond et al., 2001) reported that victimization in year 8 of secondary school (13 years of age) was associated with *newly* incident symptoms of depression the following year. However, a follow-up of Finnish children involved in bullying at the age of 8 or 12 years indicated that when psychiatric symptoms were taken into account, involvement in bullying did not independently increase the likelihood of depressive symptoms at 15 years of age (Kumpulainen & Rasanen, 2000). Similarly, a 2year follow up of peer victimization among students in their first two years of high school in Australia, found that victimization at baseline was not predictive of "psychiatric health" as measured by the General Health Questionnaire (GHQ) after baseline health status was taken into account (Rigby, 1999). While additional longitudinal studies of bullying behavior are available (Bowes et al., 2009; Kumpulainen et al., 1999; Sourander et al., 2000; 2009) only a few have examined the effects of bullying behavior on later suicidality and self harm. Barker et al. (2008) have found that boys and girls who were bully-victims (bullying was assessed at age 14–16, and victimization at ages 13–16) were the highest in self-harm at age 16 compared to bullies and victims. Recently, Kim et al. (2009) examined the independent impact of bullying on suicidal ideation and suicidal/self-injurious behaviors after 10 months among a sample of 1655 7th and 8th grade Korean students. The results indicated that adolescents involved in bullying, especially victim-perpetrators and victims, girls who are perpetrators and boys with later onset bullying behaviors were at increased risk for suicidal/ self-injurious behaviors and ideation, even after controlling for other suicide risk factors, such as anxiety and depression. Contradictory findings have been reported in our examination (Klomek et al., 2008, 2009) of the association of childhood bullying behavior with later depression, suicidal ideation, attempts and completed suicide. Among a large birth cohort of Finnish boys born in 1981, we found that bullying behavior at age 8 was associated with severe depression 10 years later, even when controlling for childhood depression. Bullying behavior at age 8 was not associated with suicidal ideation 10 years later when controlling for childhood depression (Klomek et al., 2008). The association between bullying behavior at age 8 years and later suicide attempts and completed suicides varied by sex. Among boys, frequent bullying and victimization were associated with later suicide attempts and completed suicide but not after controlling for conduct and depression symptoms; frequent victimization among girls was associated with later suicide attempts and completed suicides, even after controlling for conduct and depression symptoms. Currently, we do not know whether bullying behavior in high school is an independent risk factor for

later depression or suicidal ideation or behavior. The present study was designed to fill this gap in knowledge. The present study examines the extent to which students who experience frequent bullying behaviors in high school (as bullies, victims or both) without concurrent depression or suicidal problems are at risk for *later* depression and suicidality. This is the only study that has systematically examined the clinical import of bullying behavior among high school students for later depression and suicidal ideation/behavior, by determining whether bullying behavior precedes the onset of depression and suicidality.

## METHODOLOGY

#### Overview

We conducted a longitudinal study of youth who experienced frequent (at least weekly) bullying behavior (as a bully, victim or bully-victim) but who did not exhibit depression or suicidality. These youths were identified from our NIMH-funded two-stage suicide screening program (Gould et al., 2005). In an earlier study we followed an at-risk cohort (N=317) of those youth who at the time of the screen reported recent or past suicidal behavior, prominent current suicidal ideation, moderate-to-severe depression and/or substance abuse impairment (Gould et al., 2009). In the current study these youth will be termed "At-Risk Only" group.

For the purpose of the current project, we were able to identify 96 youth among the at-risk cohort who were also involved in bullying behavior (as bullies, victims or both) at the time of the screen ("At-Risk Bully" group). The current project targeted an additional group of youth who experienced frequent bullying behavior at baseline but who had not exhibited depressive or suicidal problems, or substance problems that would have triggered their identification by the screen ("Bully only" group) (N=236). These youth were interviewed approximately four years after the screen to assess their risk status at follow-up (Figure 1). We first approached the youths' parents by mail, using the address we had on file from our high school study, and asked them to forward our recruitment letter to the youth. If the family had moved we would attempt to track them and the youth by use of address corrections requested from the postal service; free Internet on-line telephone and address directories; "Intelius" Database Search, "Private Eye", and other for-fee services.

The mean length of follow-up was 753.5 days (SD=146.4) for the At risk only group, 736.9 days (SD=146.0) for the At risk bully group and 1406.1 days (SD=243.8) for the Bully only group. There was no significant difference between the 'at risk only' group and the 'at risk bully' group. However, the length of follow-up for the 'bully only' group was significantly longer than that of the other two groups ('at risk only' vs. bully only' t = 27.4 with 284 d.f. p < .001; 'at risk bully' vs. 'bully only' t = 18.9 with 196 d.f. p < .001).

### Participants

Adolescents aged 13 through 18 years, enrolled in 9<sup>th</sup> through 12<sup>th</sup> grade in six high schools in Nassau, Suffolk and Westchester counties in New York State, were the targeted population for the suicide screening project from which the cohorts for the present project were identified. Five schools were public co-ed schools and one was a parochial all-boys school. We assessed 2342 of 3635 students (64.4% participation rate) from the fall of 2002 through the spring of 2004. Reasons for nonparticipation included parent refusals (61.9%), student refusals (14.3%), and absences (23.7%). The ethnic distribution of the participating sample was 80.3% White, 5.1% African American, 7.3% Hispanic, 3.8% Asian, and 3.5% other; 58.1% of the students were male. The inclusion of an all-male parochial school explains the high percentage of boys. The average age of participating students was 14.8

years ( $\pm 1.2$  s.d.). There were no significant differences between participants and non-participants in gender, age, and ethnicity (see Gould et al.2005 for details).

An at-risk cohort included those youth who reported recent or past suicidal behavior, prominent current suicidal ideation, moderate to severe depression and/or substance abuse impairment, based on standard risk indicators in suicide screening programs (Shaffer & Craft, 1999). A face-to-face clinical evaluation was conducted with all suicidal youth to validate their responses on the screening surveys. The parents of each at-risk student were contacted by a project clinical social worker to initiate case-management and referral procedures. A total of 317 at-risk students were identified ("At-Risk Only" group) (Gould et al., 2009). Among the at-risk cohort, there were 96 students who reported frequent bullying behavior (as bullies, victims, bully-victims) during the screen ("At-Risk Bully" group). The ethnic distribution of this subgroup was 77.1% White, 4.2% African American, 11.5% Hispanic, 5.2% Asian, and 2.1% other; 45.8% of the bully subsample was male. Their average age was 14.8 years (±1.2 s.d.). There were no significant demographic differences between the bully subsample and the remaining at-risk cohort. Moreover, there were no significant differences between follow-up participants (having a youth interview) and non-participants in terms of gender, ethnicity, and baseline psychiatric measures (Table 1).

Another cohort included 236 students who reported being bullied or bullying others once a week or more, and who were *not* identified as at-risk ("Bully only" group). Approximately 62% (n=146) of this subsample participated in the follow up; another 6.4% refused to participate and 38.8% were lost to follow-up. There were no significant differences between follow-up participants and non-participants in terms of gender, ethnicity, and baseline psychiatric measures (Table 1). Of the Bully only group there were 79 participants who had bullied others but were not victims of bullying, 48 who did not bully others but were victims of bullying.

#### Measures

The same measures were used in screening and follow-up assessments, with the exception of the bullying measure which was used only at baseline. Self-completion screening questionnaires were completed by the students over two class periods, on separate days (described in detail in Gould et al., 2005). The follow-up measures were administered in an interview format via telephone.

**Beck Depression Inventory (BDI-IA)**—The BDI-IA (Beck & Steer, 1993) contains 21 items that assess cognitive, behavioral, affective, and somatic components of depression. The responses for each question range from 0 (the depressive symptom is not present) to 3 (the symptom is severe). The BDI has demonstrated excellent internal consistency (0.8 to 0.9) and good test-retest reliability (0.7) in research in adolescents (Strober et al., 1981; Teri, 1982) and excellent sensitivity (83.3) and specificity (81.3) in identifying major depression in adolescents (Roberts et al., 1991). The BDI has been used in over 200 studies, many of which included adolescents (Strober et al., 1981; Teri, 1982; Roberts et al., 1991).

**Suicidal Ideation Questionnaire (SIQ-JR)**—The 15-item SIQ-JR (Reynolds, 1988) uses a 7-point Likert-type scale, ranging from 0 ("I never had this thought") to 6 ("This thought was in my mind almost every day"), assessing the frequency of specific suicidal thoughts during the past month. It assesses a wide range of thoughts related to death and dying, passive and active suicidal ideation, and suicidal intent. Reliability of the SIQ-JR is high, ranging from .91 to .96 (Keane et al., 1996; Reynolds, 1988; Reynolds & Mazza, 1999) for internal consistency and from .87 to .93 for test-retest reliability (.89 overall; .87 for females and .93 for males). The SIQ-JR has demonstrated criterion validity (King et al.,

1993; Reynolds, 1988, Reynolds & Mazza, 1999) construct validity in community (Keane et al., 1996; Reynolds & Mazza, 1999; Mazza, 2000) and clinical samples (King et al., 1993) and predictive validity (Keane et al., 1996).

**Suicide Attempt History**—Seven questions asking about lifetime and recent suicide attempts were derived from the depression module of the Diagnostic Interview Schedule for Children (DISC-IV) (Shaffer et al., 2000) and an earlier suicide screen (Shaffer et al., 2004). These items have demonstrated good construct validity (Gould et al., 1998; Shaffer et al., 2004). The assessment of an attempt included questions about occurrences, injuries sustained, medical care sought and hospitalization (Meehan et al., 1992).

**Drug Use Screening Inventory (DUSI)**—The DUSI (Tarter & Hegedus, 1991; Tarter et al., 1992) is designed to screen for alcohol or drug use and problems among teenagers, and has demonstrated good reliability, discriminant validity and sensitivity and has published normative cutoff scores (Kirisci et al., 1995; Tarter & Hegedus, 1991; Tarter et al., 1992; Tarter et al., 1994). A total score combines all 15 items from the substance use scale (assessing the degree of involvement and severity of consequences from alcohol and drug use), 3 alcohol or drug items on the school performance adjustment scale, and 1 additional aggression item assessing the clinically predictive problem of breaking things or getting into fights while under the influence of alcohol or drugs (Shaffer et al., 1996).

**Columbia Impairment Scale (CIS)**—The CIS provides a measure of overall severity of functional impairment (Bird et al., 1993). It is a 13-item scale tapping four major areas of functioning: interpersonal relationships, school/work, certain broad areas of psychopathology (general behavior or mood), and use of leisure time. The CIS has demonstrated good internal consistency (0.7 - 0.9), test-retest reliability (0.6 - 0.9) and discriminant validity (Bird et al., 1993). The CIS also shows moderate to high correlations with other specific indications of psychological dysfunction, such as referral for mental health interventions (Bird, 1999). The CIS was administered to both adolescents and their parents at the follow-up.

**Bullying/Bullied Experiences**—Several questions regarding bullying behavior were derived from the World Health Organization study on youth health (Nansel et al., 2001). The subject was introduced as follows: "The next 7 questions are about bullying. We say a student is being bullied when another student, or group of students, says or does nasty and unpleasant things to him or her. It is also bullying when a pupil is teased repeatedly in a way he or she doesn't like. But it is not bullying when two students of about the same strength quarrel or fight." Separate questions assessed the frequencies of bullying and being bullied at school and away from school property. Additional questions asked students to report the frequency with which they were bullied in each of seven ways. The items were coded on a five-point scale from (0) "not at all" to (4) "most days". Frequent bullying and being bullied was defined as once a week or more (Nansel et al., 2001).

#### **Definition of At-Risk Status**

A youth was determined to be "at-risk" (Gould et al., 2005, 2009) from the baseline screen if he/she (1) reported serious suicidal ideation as operationalized by a score greater than or equal to 31 on the SIQ-JR; or an endorsement of any of 6 SIQ-JR "critical items" at the clinically significant levels of "a couple of times a week" or "almost every day" ("I thought about killing myself"; "I thought about how I would kill myself"; "I thought about when I would kill myself"; "I thought about what to write in a suicide note"; "I thought about writing a will"; "I thought about telling people I had a plan to kill myself"); or an endorsement of BDI item statements "I would like to kill myself" or "I would kill myself if

I had a chance"; (2) endorsed a past suicide attempt (regardless of timing, injury or medical attention); (3) exhibited depression as defined by a BDI score greater than or equal to 16; or (4) reported a substance problem, as manifested by an endorsement of 4 out of 8 clinically significant impairment items on the DUSI (Gould et al., 2005). These risk criteria were based on those identified in psychological autopsy studies of youth suicide (Gould et al., 2003).

For adolescents reporting serious suicidal ideation, any past suicide attempt, depression with any level of suicidal ideation, or a request to talk to a clinician, a "Safety Review" interview was conducted by a project child psychiatrist, psychologist or social worker. Members of the project's clinical team interviewed these adolescents to assess imminent suicide risk and the need for further evaluation and possible treatment. If survey responses were substantiated during the interview, a project social worker contacted the parents by telephone to provide a summary of the screening results, verify a student's report of current treatment, and discuss recommendations for further evaluation and treatment with a local mental health provider. Since most youth with depression and substance abuse problems do not engage in suicidal behavior, those who scored above the cutoff on the BDI or DUSI, without reporting current suicidal ideation or history of attempts, were not interviewed by our project's clinical team; however project social workers notified their parents of the survey findings.

The study procedures were approved by the institutional review board of the New York State Psychiatric Institute/Columbia University Department of Psychiatry.

#### **Data Analysis**

As described above, the cohort of youth who reported frequent bullying but did not meet the at-risk criteria is termed "bully only" group. Those who concurrently reported frequent bullying and any at-risk criterion are the "at-risk bully" group. The "at-risk only" group represents those among the at-risk subsample who did not report frequent bullying behavior. Lastly, those termed "no risk-no bully" reported neither frequent bullying nor any at-risk criterion. Our analyses are guided by three specific a priori contrasts: (1) bully only in contrast to the at-risk bully and at-risk only groups at follow-up; (3) within-group longitudinal analyses.

Psychiatric status outcomes are depression (BDI), suicidal ideation (SIQ-JR), suicide attempts, substance use impairment (DUSI), and functional impairment reported by the youth (CIS-Y). With the exception of history of suicide attempts, the outcomes were used as continuous variables.

For the baseline contrasts, all continuous outcomes and the one dichotomous outcome (history of suicide attempts) were examined by use of a series of independent t-tests and chisquare analyses with the continuity correction, respectively. Longitudinal analyses used a series of t-tests for dependent samples for the continuous variables and McNemar chi square test for the dichotomous variable.

The follow-up participants were employed in all analyses (including the baseline comparisons), unless otherwise noted. Analyses were conducted for the total sample and repeated for males and females separately because the group of students who only reported frequent bullying behavior had a higher proportion of boys than either of the other groups (Table 1). There were no significant differences in age or ethnicity between the groups. Outcomes of individuals classified as bully only (but not high risk) were examined by bully status (i.e., based on whether they were a bully, victim, or bully-victim) in a supplementary analysis.

# RESULTS

#### **Psychiatric Problems at Baseline**

The students who reported only frequent bullying behaviors (as bullies, victims or both) ("bully only" group) at baseline had significantly fewer psychiatric problems than the two at-risk groups (i.e. "At risk only" group- students identified as at risk for suicide and "At-risk bully" group- those who were both at risk and involved in bullying behavior) (Table 2), which is to be expected given the criteria for at-risk status. Specifically, the "bully only" group was significantly less likely than the "at-risk bully" group to report depressive symptoms, suicide ideation, suicide attempts, substance problems, and functional impairment, which was not a criterion for at-risk status (depression: t=18.86 p<.001; suicide ideation: t=11.47 p<.001; suicide attempts:  $\chi^2$ =47.41 p<.001; substance problems: t=6.30 p<.001; functional impairment: t=10.86 p<.001). Similar results emerged for the comparison between the "bully only" and "at-risk only" groups (depression: t=17.85 p<.001; suicidal ideation: t=10.34 p<.001; suicide attempts:  $\chi^2$ =49.59 p<.001; substance problems: t=5.10 p<.001; functional impairment t=7.19 p<.001). Boys and girls showed the same pattern of results (Table 3).

A comparison of those who only reported frequent bullying behavior ("bully only" group) with the remaining "not at risk" group ( i.e., those students who reported neither frequent bullying nor any at-risk criterion) indicated that the bully group had significantly higher means than the "no risk-no bully" group on depression (t=5.59 p<.001), suicidal ideation (t=4.04 p<.001), substance problems (t=3.48 p<.01), and functional impairment (t=10.64, p<.001). These analyses employed the total baseline bully only (n=236) and no risk-no bully groups (n=1,789). The results were similar for boys and girls.

Overall, the students who were involved in bullying behaviors (as bullies, victims or both) in conjunction with other risks at baseline ("At-risk bully") were significantly more depressed (t=-2.87 p<.01); had more substance problems (t=-2.10 p<.05); and were more functionally impaired (t=-4.01 p<.001) than at-risk students who did not report bullying behaviors. The "at-risk bully" group did not have higher rates of serious suicide ideation or past attempts than the "at-risk only" group, but their mean on the SIQ, while not exceeding a clinical threshold, was significantly higher (t=-2.081 p<.05). A similar pattern of results emerged for girls only (depression: t=-2.56 p<.05; substance problems: t=1.71 NS; functional impairment: t=-3.17 p<.01), but not for boys only, for whom none of the differences were significant, with the exception of the functional impairment scores (t=2.447 p<.05) (Table 3).

### **Psychiatric Problems at Follow Up**

Few of the bullying/bullied students made suicide attempts during the 4-year follow-up (2 out of 138 total bully/bullied males, and none out of the 62 total bully/bullied females). The youth who only reported frequent bullying behaviors at baseline ("bully only" group) continued to have significantly fewer psychiatric problems than the two at-risk groups, with the exception of substance problems for which there were no significant differences between the groups (Table 2).

A comparison of the two at-risk groups ("At-risk bully" Vs. "At-risk only") indicated that the students who were involved in bullying behaviors (as bullies, victims or both) in conjunction with other risks in high school were significantly more likely to be functionally impaired four years later (t=2.35 p<.05), but no other significant differences emerged between the overall groups (Table 2). No significant differences emerged for boys and girls (Table 3).

Overall, each group exhibited fewer psychiatric problems at follow-up than at baseline (Table 3). The students who reported only bullying behaviors in high school were significantly less depressed (t=2.15 p<.05), expressed a lower level of suicidal ideation (t=3.86 p<.001), and were less likely to be functionally impaired (t=10.05 p<.001) at follow-up, but they scored significantly *higher* on the substance problems scale four years later (t=5.23 p<.001), albeit not above the clinical threshold. The two at-risk groups scored significantly lower on all outcome measures, including the substance problems scale. The pattern was essentially the same for males and females (Table 3).

### Specific Types of Bullying Behavior

Among the youth who only reported frequent bullying behaviors at baseline, *victims* were significantly less likely to have substance problems than youth who *bullied others* (t=2.24 p<.05) or were *bully-victims* (t=4.52 p<.001) (Table 4). In contrast, the students who were only victims had significantly higher mean depression (t=3.24 p<.01) and suicide ideation scores (t=2.04 p<.05) than those who bullied others. Similarly, those who were both bully-victims had higher depression scores than those who only bullied others (t=2.29 p<.05).

At follow-up, the students who were only victims continued to have significantly higher mean suicide ideation scores than those who only bullied others (t=2.75 p<.05). The students who had been bully-victims in high school had higher mean suicide ideation (t=2.51 p<.05) and functional impairment (t=2.24 p<.05) scores at follow-up than the bullies.

Overall problems decreased over time (Table 4), with the exception of substance problems that increased over time for victims (t=3.76 p<.001) and bullies (t=3.70 p<.001), although not above the clinical threshold. The small number of youth who were both victims and bullies precluded detecting significant differences for that group.

### DISCUSSION

Involvement in bullying behavior (as either a bully, a victim or both) in the absence of other risks in high school did not predict later depression, suicidal ideation or suicide attempts; however, it did portend an increased use of substances. Four years after the initial assessment, when all the students were no longer in high school, internalizing problems were still significantly less frequent among those who had only reported frequent bullying behaviors in high school compared to students identified as at-risk for suicidal behavior (based on suicidal ideation, suicidal behavior, depression or substance abuse); yet, levels of substance problems were comparable to those for youths identified as "at-risk" in high school. This appeared to be so regardless of whether the high school student had been the victim of bullying, the bully or both, and whether male or female. Overall, victims of bullying behavior were more depressed and suicidal than bullies, and those who were both victims and bullies continued to exhibit the most problems at follow-up.

Our findings are consistent with the only other follow-up study of high school students - a 2year follow up of peer victimization among Australian youth - which found that victimization at baseline was not predictive of later "psychiatric health" after baseline health status was taken into account (Rigby, 1999). Moreover, bullying behaviors among younger children have been reported to predict depression, but not necessarily suicidal ideation and behavior. Among a large birth cohort of Finnish boys, bullying behavior at age 8 was associated with severe depression, but not with suicidal ideation, 10 years later, when controlling for childhood depression (Klomek et al., 2008). Additionally, it was bullies and victims with psychiatric symptoms at age 8 rather than all bullies or victims per se that were at elevated risk of later psychiatric disorders (Sourander et al., 2007). In another study from the same birth cohort Sourander et al. (2009) have reported that frequent victimization among girls but not among boys predicted psychiatric hospital treatment and use of psychopharmacologic medication when controlled with the effect of baseline psychopathology.

Our findings are inconsistent with the 10-month follow-up of Korean middle-school students (Kim et al., 2009), which found bullying behaviors to be an independent risk of suicidal behavior and ideation. The discrepancies may stem from differences in study methods, including length of follow-up, age of participants, and differences in bullying identification methods (peer nomination versus self-reports).

While the students who reported only bullying behaviors did not recount other problems at levels meeting the "at-risk" threshold, they were significantly more depressed, suicidal and impaired than other "not at risk" students who did not report bullying behaviors while in high school. Thus, they were not as healthy as students who had not reported bullying behaviors.

Students who experienced bullying behaviors in conjunction with problems warranting their meeting the suicidal-risk threshold in high school were more depressed, had more substance problems, and were more functionally impaired than those at-risk youth not experiencing bullying behaviors. Four years later, the at-risk youth who had experienced bullying behaviors continued to be more functionally impaired. Similarly, Sourander and colleagues (2007) found that bullies and victims at age 8 who had concurrent psychiatric symptoms had worse long-term outcomes than children who had high levels of psychiatric symptoms but did not bully or were not victimized.

In our earlier study (Gould et al., 2005) we included bullying behavior in our screening assessment, but available prospective research was not sufficient to guide any clinical recommendations for students reporting this behavior in the absence of other known risk indicators on the suicide screen. To our knowledge, this is the first study to examine the clinical import of bullying behavior in the absence of other psychopathology among high school students for later depression and suicidal ideation/behavior.

The longitudinal design is a major strength of the study, providing a more valid examination of the independent sequelae of bullying behavior than cross-sectional data can provide. However, the study has several limitations. First, since students who were not at risk and not engaged in bullying behavior were not followed, we are unable to determine whether the significant differences between them and those who only reported bullying behaviors in high school continued four years later. However, the remaining contrasts between those who only reported bullying behaviors and the two at-risk groups yielded clinical meaningful differences. Second, the length of follow-up for the 'bully only' group was significantly longer than that of the other two groups. The follow-up of the bully only group was funded by a different grant (approximately 2 years later) than the follow-up protocol of the at risk groups. The growing interest in the impact of bullying prompted the later grant that focused on the sequelae of bullying in the absence of concurrent suicidality, depression, or substance problems. The longer length of follow-up of the bully only group is unlikely to jeopardize our findings or conclusions because this group had even more opportunity to manifest the outcomes of interest, but did not. Third, while we included questions about specific types of victimization (e.g. cyberbullying), we were unable to examine their impact separately due to small sample sizes. Fourth, we do not know about stability of bullying in this sample given that bullying status is only assessed at one point. The at-risk and non-at-risk bullying groups could have differed in stability, history, onset of bullying, or type or quality of bullying behaviors, and that these factors could have been related to outcomes. Fifth, we employed suburban schools with predominantly white populations of limited socioeconomic diversity

because the sampling frame was dictated by design considerations of our earlier study (Gould et al., 2005). As such, the results cannot be generalized to urban, more ethnically or socioeconomically diverse settings. Previous studies reporting on ethnicity and socioeconomic status as factors in bullying behavior have shown inconsistent results (Nansel et al., 2001; Olweus, 1999; Seals & Young, 2003; Veenstra et al., 2005; Wolke et al., 2001). Sixth, only sixty-two percent of eligible subjects participated in the study, but we found no demographic or baseline clinical differences between participants and non-participants. Lastly, information about bullying behavior is based only on self reports. Future studies may want to include peer nomination or parent/teacher reports.

In summary, bullying behavior in the absence of depression or suicidality does not warrant inclusion as a stand-alone risk indicator on a suicide screen. However, experiencing bullying behaviors in conjunction with depression or suicidality in high school is indicative of more serious concurrent problems and portends a worse outcome four years later than exhibiting depression or suicidality only. Thus, a clinical recommendation emerging from this study is to include an assessment of bullying behaviors in all suicide screening protocols.

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**Figure 1.** Description of Sample, showing Rates of Participation in Follow-up

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		Bully	Only		At-Ris	k Bully		At-Ris	k Only
	Total	Participants	Non- participants	Total	Participants	Non- participants	Total	Participants	Non- participants
	N=236	N=146	06=N	96=N	N=54	N=42	N=221	N=142	N=79
Age mean,sd	14.8, 1.1	14.8, 1.1	14.9, 1.0	14.8, 1.2	14.9, 1.2	14.7, 1.1	15.0, 1.2	15.1, 1.2	14.8, 1.1
Sex %									
Male	83.9	80.8	88.9	45.8	37.9	57.1	39.8	35.2	48.1
Female	16.1	19.2	11.1	54.2	63.0	42.9	60.2	64.8	51.9
Ethnicity %									
White	80.5	84.9	73.3	77.1	85.2	66.7	78.7	78.2	7.9.T
African Am.	3.0	2.7	3.3	4.2	3.7	4.8	5.0	3.5	7.6
Hispanic	11.4	8.2	16.7	11.5	7.4	16.7	9.0	11.3	5.1
Asian	3.4	2.7	4.4	5.2	1.9	9.5	3.2	3.5	2.5
Other	1.7	1.4	2.2	2.1	1.9	2.4	4.1	3.5	5.1
Psychiatric status									
Dichotomous measures %									
Attempts	0	0	0	32.3	33.3	31.0	27.6	30.3	22.8
Continuous measures mean,sd									
Depression	6.2, 4.0	6.2, 4.0	6.3, 4.0	21.8, 7.6	21.9, 7.6	21.8, 7.8	19.1, 7.2	18.5, 7.2	20.1, 7.2
Suicide ideation	5.5, 6.1	5.7, 6.3	5.3, 5.7	26.3, 19.8	26.4, 19.3	26.2, 20.8	21.2, 18.1	20.6, 16.1	22.3, 21.2
Substance problem	1.2, 2.0	1.1, 1.9	1.4, 2.2	3.7, 4.6	4.0, 4.8	3.2, 4.4	2.6, 3.4	2.7, 3.5	2.2, 3.3
Functional impairment	8.7, 6.2	8.6, 6.0	9.0, 6.6	19.8, 8.1	20.2, 8.3	19.2, 8.0	14.9, 8.5	14.8, 8.2	15.1, 9.1
No significant differences between	narticinante	and non-nartici	nante						

# Table 2

Psychiatric Problems at Baseline and Follow-up by At-Risk and Bully Status for Participants in Follow-up

		Bul	ly Onl	y		At-R	isk Bull	y		At-Ris	sk Onl	y
		Z	=146			2	V=54			z	=142	
	Bas	eline	Fol	dn-woll	Base	eline	Fol	dn-wol	Base	line	Fol	dn-wol
Dichotomous measure $%$												
Attempts	0	p(		$0^c$	33	.3	Э.	7***	30		4	2***
Continuous measures mean, SD												
Depression	6.2	$4.0^{a}$	5.4	$4.4b^{*}$	21.9	7.6	11.3	8.4***	18.5	7.2	9.7	6.8***
Suicide ideation	5.7	6.3 <i>a</i>	3.8	$4.1^{b^{***}}$	26.4	19.3	10.7	12.3 <sup>***</sup>	20.6	16.1	8.5	8.1 <sup>***</sup>
Substance problem	1.1	$1.9^{a}$	2.2	2.4***	4.0	4.8	2.0	2.7**	2.7	3.5	1.8	2.6 <sup>**</sup>
Functional impairment	8.6	6.0 <i>a</i>	3.0	$3.7b^{***}$	20.2	8.3	8.8	7.6 <sup>d***</sup>	14.8	8.2	6.3	6.3***
<sup>d</sup> Baseline contrasts between the Bt	ully On	ly grouj	p and e	ach of the o	other tw	o group	s for all	the measur	es are si	gnifical	nt at p-	<.001
bFollow-up contrast between Bully	y Only	group a	nd eacl	n of the oth	er two g	roups is	signific	cant at p<.0	01			
$^{c}$ Follow-up contrast between Bully	y Only	and At-]	Risk O	nly groups	is signif	icant at	p<.05					
dFollow-up contrast between At-R	iisk Bul	lly and /	At-Risk	t Only grou	ıps is sig	gnifican	t at p<.0	5				
*/**/*** Within-group contrast bet	ween b	aseline	and fol	low-up me	asures i	s signifi	cant at r	o<:05: p<:0	1: p<.00	Irespec	ctivelv	

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# Table 3

Psychiatric Problems at Baseline and Follow-up by At-Risk and Bully Status and Sex for Participants in Follow-up

	Bull	ly Only	M At-Ris	ales sk Bully	At-Ris	sk Only	Bull	/ Only	Fer At-Ri	nales sk Bully	At-Ris	k Only
	Z	=118	Ż	=20	Ż	=50	Ż	=28	Z	=34	Ż	<u>-</u> 92
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Dichotomous measure %												
Attempts	$0^{a}$	$0_{c}$	25.0	10.0	28.0	4.0***	$q^0$	0	38.2	0	31.5	4.3***
Continuous measures mean, sd												
Depression	$5.5, 3.6^{a}$	5.0, 4.0d	19.1, 7.3	8.2, 3.8*	15.9, 7.2	8.0, 5.8***	9.3, 4.3 <i>a</i>	$7.0, 5.7e^{*}$	23.5, 7.3	$13.1, 9.8^{***}$	19.9, 6.9	$10.6, 7.2^{***}$
Suicide ideation	$4.9, 6.0^{a}$	$3.3, 3.4^{d**}$	25.1, 21.8	$11.00, 14.9^{*}$	21.3, 18.9	6.6, 5.7 <sup>***</sup>	9.0, 6.3 <i>a</i>	$5.5, 6.1^{e^*}$	27.3, 17.8	$10.6, 10.6^{***}$	20.2, 14.6	$9.6, 9.0^{***}$
Substance Problem	$1.0, 1.8^{d}$	2.2, 2.2 <sup>***</sup>	4.6, 5.0	$2.0, 2.6^{***}$	3.1, 4.4	$1.9, 2.7^{*}$	1.5, 2.1	2.3, 3.3	3.7, 4.7	$2.1, 2.9^{*}$	2.6, 2.8	$1.7, 2.5^{**}$
Functional impairment	8.1, 6.1 <sup>a</sup>	$2.7, 3.5d^{***}$	19.9, 8.2	$7.1, 4.9^{***}$	14.1, 8.7	5.2, 4.5***	$10.7, 5.4^{b}$	$4.2, 4.3^{c^{***}}$	20.3, 8.4	9.9, 8.7 <sup>***</sup>	15.1, 8.0	6.9, 7.1 <sup>***</sup>
<sup>a</sup> Baseline contrast between the	Bully Only g	roup and each o	of the other tw	o groups is sign	ificant at p<.'	001						
bBaseline contrast between the	Bully Only g	rroup and each o	of the other tw	o groups is sign	ifīcant at p<.	01						
$^{c}$ Follow-up contrast between th	e Bully Only	group and the A	At-Risk Bully	group is signifi	cant at p<.01							
$d_{ m Follow-up}$ contrast between th	e Bully Only	group and each	t of the other t	wo groups is si	gnificant at p	<.001						
$e^{Follow-up}$ contrast between B	ally Only gro	up and each of t	the other two	groups is signif	icant at p<.05							

\*/\*\*/\*\* Within-group contrast between baseline and follow-up measures is significant at p<.05; p<.001; p<.001respectively

# Table 4

Psychiatric Problems at Baseline and Follow-up by Specific Bully Behaviors for Participants in Follow-up

	Bull	ied (Victi	ms) O	nly	Bully	y (Perpet	rators	) Only	Bull	y-Victir	su	
	<b>N=</b> 4	æ			N=7	6			N=1	6		
	Base	eline	Follo	dn-m	Base	line	Follo	dn-m	Base	line	Follc	dn-w
Dichotomous measures %												
Attempts		0		0		0		0		0		0
Continuous measures mean,SD												
Depression	7.5	$4.0^{b}$	6.1	$4.1^*$	5.1	$4.0^{b,d}$	4.6	4.1	7.4	2.9d	6.7	5.8
Suicide ideation	6.8	<i>p</i> 6.9	4.6	$4.0^{b*}$	4.5	5.7a	2.8	$3.2^{b,d^{**}}$	7.4	6.1	5.4	$6.4^d$
Substance problem	0.5	$1.1^{a,c}$	1.9	2.4***	1.2	2.1 <i>a</i>	2.3	$2.2^{***}$	2.2	$2.1^{c}$	3.1	3.2
Functional impairment	9.6	7.0	3.4	3.3***	7.8	5.6	2.4	$3.4^{d^{***}}$	9.3	4.4	4.6	$5.3d^{*}$
<sup>a</sup> Contrast between the Bullied and	l Bully	groups is	signifi	icant at p<	.05							
bContrast between the Bullied and	l Bully	groups is	signifi	icant at p<	:01							
$^{c}$ Contrast between the Bullied and	l Victir	n-Perpetra	ttor gro	oups is sig	nifican	tt at p<.00	11					
dContrast between the Bully and V	/ictim-	Perpetrato	or grou	tps is signi	ficant	at p<.05						
*/**/*** Within-group contrast be	tween l	baseline a	follo	ow-up me	asures	is signific	cant at	p<.05; p<.0	1; p<.C	01respe	ectively	~