ORIGINAL ARTICLE

School Bullying and Youth Violence

Causes or Consequences of Psychopathologic Behavior?

Young Shin Kim, MD, MS, MPH, PhD; Bennett L. Leventhal, MD; Yun-Joo Koh, PhD; Alan Hubbard, PhD; W. Thomas Boyce, MD

Context: The causal relation between school bullying and psychopathologic behavior has been the focus of substantial debate. Previous studies have failed to garner causal evidence in either direction, largely because of methodologic constraints such as cross-sectional study designs, shared method variance, and analytic shortfalls.

Objective: To determine the direction of the causal relation between psychopathologic behavior and school bullying.

Design: Prospective cohort study.

Setting: Two Korean middle schools.

Participants: A total of 1655 seventh- and eighth-grade students were studied between 2000 and 2001.

Main Outcome Measures: School bullying was assessed by peer nomination, and 7 subscales of the Korean Youth Self Report were used to identify symptoms of psychopathologic behaviors. School bullying was categorized into 4 groups: victims, perpetrators, victim-perpetrators, and neither. A T-score on the Korean Youth Self Report greater than 65 was regarded as a clinically significant indicator.

Results: Social problems increased the risk of becoming a victim or a victim-perpetrator (odds ratio [OR], 2.3 and 2.7, respectively), and these associations disappeared when baseline bullying status was adjusted. Ten months later, individuals who were victims at baseline showed increased risk of social problems (OR, 3.9), those who were perpetrators had increased aggression (OR, 1.8), and victim-perpetrators had increased aggression and externalizing problems (OR, 4.9 and 4.6, respectively). Analyses that examined exposure history provided additional evidence for the causal effect of bullying experience on the later development of psychopathologic behaviors because most forms of psychopathologic behavior that led to new-onset bullying at follow-up were also present at follow-up, making it impossible to distinguish the temporal sequence of these variables and their causal relationship. However, most forms of new-onset psychopathologic behaviors at follow-up were associated with antecedent bullying experience.

Conclusions: Our study results support the conclusion that psychopathologic behavior, including social problems, aggression, and externalizing behavioral problems, is a consequence rather than a cause of bullying experiences. This causal relation is supported by the strength and specificity of the association and the temporal antecedence of bullying. Because school bullying is a known correlate of youth violence, such a finding adds greater urgency to the search for programs to prevent or diminish bullying among schoolchildren.

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School bullying is considered to be a common precursor of youth violence and is a marker for more serious violent behaviors, including weapon carrying, frequent fighting, and fighting-related injury, with national prevalences ranging from 9% to 54%.[1-5] Bullying is a constellation of behaviors that can be characterized as (1) aggressive or intended to harm, (2) performed repeatedly and over time, and (3) occurring in interpersonal relationships in which a power imbalance exists.[6] Bullying behavior can be physical (hitting, pushing, and kicking), can be verbal (name calling, provoking, making threats, and spreading rumors), or can include other behaviors, such as making faces or social exclusion.[7]

The association between school bullying and psychopathologic behavior has been extensively debated, yielding 2 causal hypotheses: (1) antecedent psychopathologic behavior is a cause of subsequent bullying, and (2) bullying can lead to future psychopathologic behaviors. The first hypothesis was supported by previous findings that showed that children with internalizing or externalizing problems, when compared with children without these characteristics, had a higher risk of involvement with bullying.[8,9] The second hypothesis was supported by previous reports of deteriorating behavioral, emotional, and psychosocial functioning in children who experienced peer victimization.[10-12] This debate is unresolved because cross-sectional designs have made it impossible to estab-

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lish causality in either direction. The small subset of prospective studies has been hindered by shared method variance, using the same informants to identify both bullying and psychopathologic behavior.[13,14] In such studies, self-reports of bullying are based on individuals' own perceptions of social circumstances, a situation in which the reporters' other psychological characteristics can lead to misinterpretation of otherwise normal social events. Respondent characteristics may also influence the reported psychopathologic behavior, resulting in a confounded relationship between psychopathologic behavior and bullying. Using peer nomination techniques to identify bullying, coupled with self-reports for assessing psychopathologic behavior, can reduce these problems. Few studies have used both a prospective design and different informants to identify bullying and psychopathologic behaviors. Even with a prospective, multi-informant design, however, it is difficult to make causal inferences because of the lack of controlling for important confounders, such as socioeconomic status and family structure. In addition, small sample sizes and the lack of representative community samples have limited the generalizability of prior findings.

The aim of the present study is to examine causal relations between psychopathologic behavior and school bullying using a 10-month prospective cohort design, multiple independent informants, and statistical controls for important confounders and combining (1) an ascertainment of profiles of psychopathologic behavior associated with the risk of future bullying (hypothesis 1: psychopathologic behavior is a cause of bullying), and (2) an assessment of psychopathologic profiles that follow experiences of bullying (hypothesis 2: psychopathologic behavior is a consequence of the bullying experience).

METHODS

STUDY PARTICIPANTS

Two schools were selected in Seoul and Anyang to represent typical Korean public middle school students. All seventh- and eighth-grade students in the schools comprised the study population and completed surveys at both the beginning and end of the study period: October 1 to November 30, 2000, and May 1 to June 30, 2001. This time frame was selected because the Korean academic year starts in March and ends in February; seventh- and eighth-grade cohorts stay in the same school but in different classrooms as they advance. Among 1759 seventh- and eighth-grade students who were eligible for this study, 1719 students (97.7%) participated at the baseline survey and 1666 (96.9%) completed the follow-up survey 10 months later. The 2 schools differed somewhat in size and class composition; the Anyang school had more classes for each grade and larger class sizes than the school in Seoul (13 and 8-10 classes per grade and 41-50 and 34-41 students per class, respectively). Additionally, Anyang had single-sex classrooms, whereas the classrooms in Seoul were coeducational.

The Hallym University Sacred Heart Hospital institutional review board approved the study, allowing the use of passive consent from parents and students. Each student completed an in-classroom survey during school hours under the direction of research assistants. The entire survey took 45 to 60 minutes.

MAIN OUTCOME MEASURES

Bullying was identified using the Korean Peer Nomination Inventory (K-PNI).[5] The K-PNI is composed of 28 items: 11 for identifying victims (for example, persons who are left out during recess or lunch time), 6 for perpetrators (for example, persons who shove and provoke others), and 11 neutral items (for example, persons who are good at sports). Students were asked to name classmates of the same sex who fit the behavioral type described in each item. The nomination of multiple individuals for each item was allowed. Good to excellent reliability and validity of the K-PNI have previously been reported in Korean children.[15] A detailed description of the K-PNI and its psychometric properties are reported elsewhere.[5]

To aggregate K-PNI data on individual students, victim and perpetrator scales of the K-PNI are expressed in a standardized percent nomination (SPN) score. The SPN is calculated by (1) summing frequencies of nominations on all items of a scale, (2) dividing the summed frequencies by the total number of items in a scale, (3) dividing this number by the number of same-sex students in a classroom, and (4) multiplying by 100. An SPN score of 1 denoted an individual who had been nominated in 1% of nomination opportunities on the victim or perpetrator scale. An SPN greater than 1 was used as the cutoff point for categorizing victims and perpetrators because it is operationally conservative, identifies a more homogeneous bullying group, and results in minimal misclassification.

Bullying experiences were categorized into 4 groups. A student with an SPN score greater than 1 on either the perpetrator or the victim scale was classified accordingly. An SPN score greater than 1 on both the victim and perpetrator scales resulted in categorization as a victim-perpetrator. Finally, a student with an SPN score of 1 or less on both scales was classified as neither.

SYMPTOMS OF PSYCHOPATHOLOGIC BEHAVIOR

Psychopathologic behavior was measured using the Korean Youth Self Report (K-YSR).[16] The K-YSR is the self-report form of the Child Behavior Checklist for adolescents between the ages of 11 and 18 years. The Youth Self-Report (YSR) yields age- and sex-based T-scores for empirically derived subscales for the last 6 months.[17] Both the YSR and the K-YSR have adequate psychometric properties.[17] The K-YSR has been normed for sex- and age-specific Korean groups and has been widely used for clinical and research purposes.[16]

Seven subscales of the K-YSR were used to measure youth psychopathologic behavior: (1) somatic complaints (headaches or dizziness), (2) anxious/depressed (feeling depressed, worrying a lot, or being anxious), (3) social problems (acts younger than own age, depends on adults, or socially immature), (4) thought problems (obsession, compulsion, or bizarre thoughts), (5) aggression (argumentative, defiant, fighting, aggressive, or cruel), (6) internalizing (passive, socially withdrawn, or internalized and overcontrolled behaviors), and (7) externalizing problems (aggressive, fighting, conduct problems, or externalized and undercontrolled behaviors). As suggested by Achenbach,[17] a T-score of 65 or greater on a scale constitutes clinically significant symptoms.

STATISTICAL ANALYSES

Descriptive statistics and χ^2 tests were used to examine the demographic characteristics of the study population as well as the prevalence of school bullying and forms of psychopathologic behavior. **Figure 1** illustrates 2 causal hypotheses for the relation between bullying and psychopathologic behavior. The

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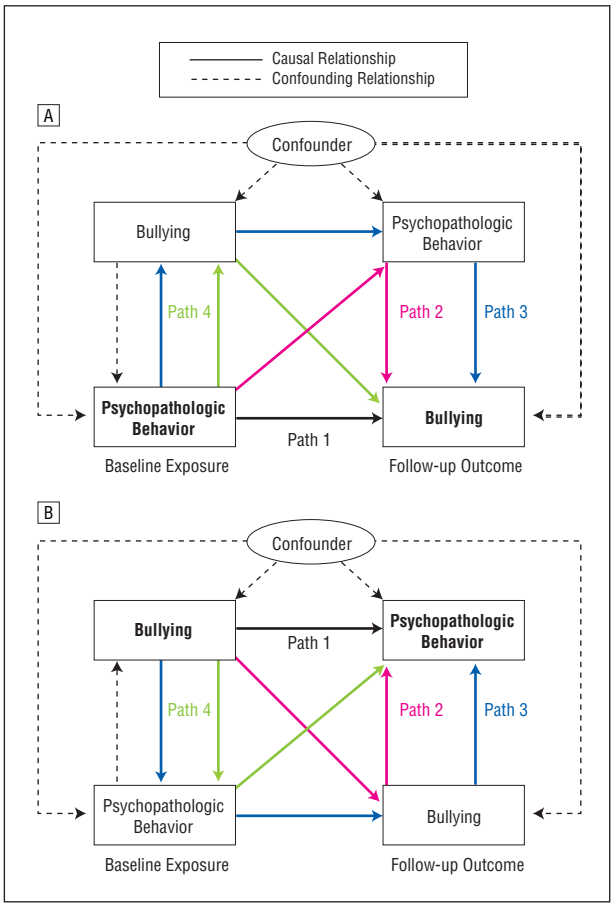

Figure 1. Models for baseline psychopathologic behavior as a cause of bullying and baseline bullying as a cause of later psychopathologic behavior. A, Causal model showing that baseline psychopathologic behavior is a cause of follow-up bullying. Four possible paths are illustrated: psychopathologic behavior at baseline directly causes bullying at follow-up (path 1), psychopathologic behavior at baseline causes psychopathologic behavior at follow-up that leads to bullying at follow-up (path 2), psychopathologic behavior at baseline causes bullying at follow-up by resulting in bullying at baseline and consequent psychopathologic behavior at follow-up (path 3), and psychopathologic behavior at baseline causes bullying at baseline that leads to bullying at follow-up (path 4). The total effect of baseline psychopathologic behavior on bullying at follow-up is the net effect from these 4 paths. Sex, age, family structure, parental educational level, socioeconomic status, and residence could potentially confound this causal relationship between psychopathologic behavior and bullying. B, Causal model showing bullying at baseline as a cause of psychopathologic behavior at follow-up. The same approach, switching the respective roles of bullying and psychopathologic behavior, was applied for this causal model. Bold type indicates baseline exposure or follow-up outcome, respectively.

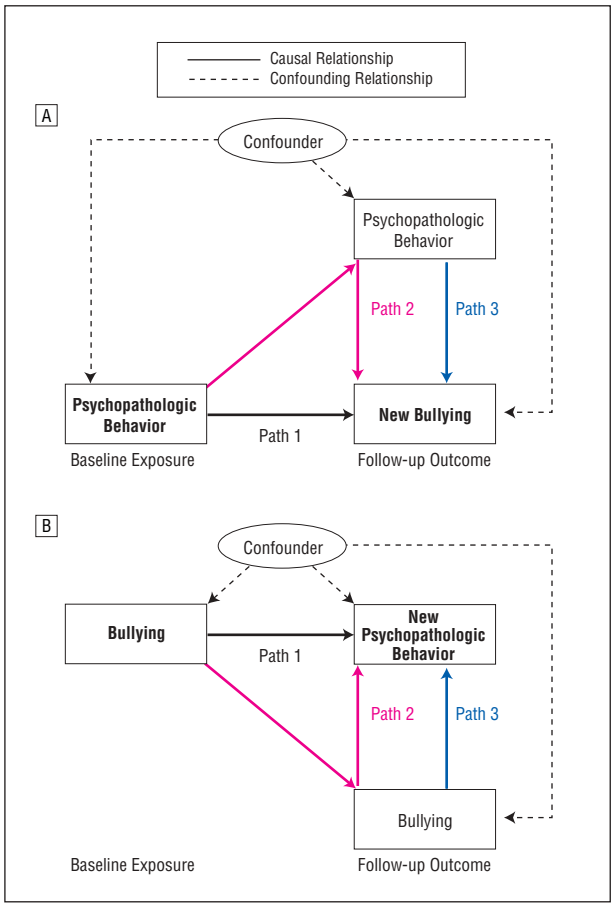

Figure 2. New onset of outcome by exposure history. A, Causal relationship between the history of psychopathologic behavior and new bullying onset at follow-up among those who were not bullied at baseline, thereby eliminating effects of baseline psychopathologic behavior through baseline bullying. Three possible paths were illustrated in this causal diagram: psychopathologic behavior at baseline directly causes new onset of bullying at follow-up (path 1), psychopathologic behavior at baseline causes psychopathologic behavior at follow-up that leads to the new onset of bullying at follow-up (path 2), and psychopathologic behavior at follow-up causes new onset of bullying at follow-up (path 3). Sex, age, family structure, parental educational level, socioeconomic status, and residence could potentially confound this causal relationship between psychopathologic behavior and bullying. B, Causal relationship between the history of bullying and new psychopathologic behavior onset at follow-up among those who did not have these behaviors at baseline. The same approach, switching the respective roles of bullying and psychopathologic behavior, was applied for this causal model. Bold type indicates baseline exposure or follow-up outcome, respectively.

first hypothesis is that psychopathologic behavior causes future bullying (Figure 1A). The total effect of the baseline psychopathologic behavior on bullying at follow-up is the net effect from this relation. Suggested confounders included sex, age, family structure, parental educational levels, socioeconomic status, and residence. The second hypothesis is that experiencing bullying causes future psychopathologic behaviors (Figure 1B).

The variables included in each model correspond to the particular hypotheses presented in Figure 1. To examine the total effect of baseline psychopathologic behavior on future bullying (sum of paths 1-4 in Figure 1A), the 7 subscales of the K-YSR at baseline were treated as independent variables and bullying status at follow-up as the outcome, using multivariate logistic regression and adjusting for confounders. In the first analysis, baseline school bullying was treated as a mediator (solid line); thus, it was not adjusted in the model. In the second analysis, baseline school bullying was treated as a confounder (dotted line) and was adjusted in the model.

In addition, we used logistic regression models to estimate the association of the history of psychopathologic behavior with new bullying onset at follow-up among those who were not bullied at baseline, thereby eliminating effects of baseline psychopathologic behavior through baseline bullying (**Figure 2**A). With the absence of psychopathologic behavior for the 10-month study period as a reference level, independent variables were categorized into 3 groups: (1) presence of psychopathologic behavior at baseline only (path 1), (2) persistent psychopathologic behavior for 10 months (path 2), and (3) presence of psychopathologic behavior at follow-up only (path 3).

These 2 sets of analyses were repeated, switching the respective roles of bullying and psychopathologic behavior. This

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Table 1. Association Between Psychopathologic Behavior and Bullying

Psychopathologic Behavior	Victim		Perpetrator		Victim-Perpetrator	
	OR 1 (95% CI)*	OR 2 (95% CI)†	OR 1 (95% CI)	OR 2 (95% CI)	OR 1 (95% CI)	OR 2 (95% CI)
Psychopathologic Behavior as a Cause of Bullying‡						
Social problems	2.35§ (1.01-5.45)	1.59 (0.59-4.26)	1.54 (0.67-3.55)	1.63 (0.67-4.00)	2.73§ (1.04-7.19)	2.28 (0.76-6.83)
Psychopathologic Behavior as a Consequence of Experiencing Bullying‖						
Social problems	3.87¶ (2.41-6.24)	3.77¶ (2.33-6.09)	0.51 (0.23-1.15)	0.52 (0.23-1.16)	1.92 (0.94-3.91)	1.88 (0.92-3.86)
Aggression	1.23 (0.60-2.51)	1.10 (0.53-2.30)	1.81§ (1.004-3.26)	1.70 (0.93-3.09)	4.85¶ (2.53-9.33)	4.94¶ (2.56-9.51)
Externalizing problems	1.34 (0.69-2.60)	1.35 (0.69-2.63)	1.72 (0.97-3.06)	1.75 (0.98-3.10)	4.82¶ (2.58-9.00)	4.60¶ (2.44-8.67)

Abbreviations: CI, confidence interval; OR, odds ratio.
*The OR 1 was adjusted for sex, grade, family structure, parental educational level, residence, and socioeconomic status.
†The OR 2 was adjusted for sex, grade, family structure, parental educational level, residence, socioeconomic status, and baseline bullying in a model for psychopathologic behavior as a cause of bullying and baseline psychopathologic behavior in a model of psychopathologic behavior as a consequence of experiencing bullying.
‡Logistic regression models included baseline psychopathologic behavior as an exposure and follow-up bullying as an outcome.
§$P<.05$.
‖Logistic regression models included baseline bullying as an exposure and follow-up psychopathologic behavior as an outcome.
¶$P<.001$.

was done by estimating the effect of bullying on the follow-up psychopathologic behavior of all students (Figure 1B) and among only those students without the particular psychopathologic behavior at baseline (Figure 2B).

For all multivariate models, multiplicative interaction terms between baseline psychopathologic behavior and sex in the first hypothesis and baseline bullying and sex in the second hypothesis were entered into the model; only interaction terms that were statistically significant were kept in the final models.

To explore whether missing data could have confounded the relationships between bullying and psychopathologic behavior, analyses were undertaken to examine whether bullying or psychopathologic behavior was any more or less present among students with missing data; no significant association was identified. Thus, there is no evidence that missing data would have biased the results.

Only positive findings are illustrated in the Tables. Tables of complete results, including both positive and negative findings, are posted on the Yale Child Study Center Web site (http://www.med.yale.edu/chldstdy).

RESULTS

STUDY POPULATION

One third of the students attended the middle school in Seoul. Sex and grade were evenly distributed. Most students came from intact families (87.4%) and were of middle socioeconomic status (94.1%). Fifty-three percent of fathers and 35% of mothers were college graduates. Detailed information on the study participants is reported elsewhere.[18]

Forty-percent of students were involved in bullying at baseline: victims, 14%; perpetrators, 17%; and victim-perpetrators, 9%. Prevalence of bullying at follow-up was 35%: victims, 11%; perpetrators, 17%; and victim-perpetrators, 7%. The SPN victim and perpetrator scores and their ranges were compared as follows: neither, victims, perpetrators, and victim-perpetrators. Median SPN victim scores were 0.00, 2.58, 0.21, and 2.88, respectively, at baseline and 0.00, 2.73, 0.20, and 2.48, respectively, at follow-up. Median SPN perpetrator scores were 0.00, 0.00, 2.50, and 4.55, respectively, at baseline and 0.00, 0.00, 2.27, and 3.33, respectively, at follow-up. These scores suggested that victims and victim-perpetrators were victimized to the same magnitude, whereas victim-perpetrators bullied other students more severely than did perpetrators.

The frequencies of psychopathologic behavior according to bullying status show that at baseline, victim-perpetrators experienced significantly more somatic symptoms than the other groups (10.3% vs 4.8%-6.5%), and all students involved in bullying experienced significantly more aggression than the students who were not involved in bullying (1.8%-2.1% vs 0.5%). At the follow-up, significantly more social problems were present in victims and victim-perpetrators (21.1% and 15.5% vs 4.8%-6.4%), aggression in perpetrators (13.8% vs 3.6%-5.5%), and externalizing problems in perpetrators and victim-perpetrators (13.6% and 11.3% vs 4.4%-5.5%) compared with students who were not involved in bullying. A table with detailed information on psychopathologic behaviors is posted on the Yale Child Study Center Web site.

TESTING 2 CAUSAL HYPOTHESES

Total Effects of Baseline Exposure on Outcomes at Follow-up

Hypothesis 1: Psychopathologic Behavior as a Cause of Bullying. Having social problems at baseline significantly increased the likelihood of becoming a victim (odds ratio [OR], 2.3) or victim-perpetrator (OR, 2.7) at follow-up. These associations disappeared when baseline bullying status was adjusted in the analyses, and psychopathologic behavior at baseline did not increase the risk of future bullying (**Table 1**).

Hypothesis 2: Psychopathologic Behavior as a Consequence of Bullying. Profiles of the associations with psychopathologic behavior varied among the different bullying groups. Being a victim at baseline led to increased risks for social problems (OR, 3.9), being a perpetrator increased the risk for aggression (OR, 1.8), and being a

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Table 2. Association Between New-Onset Bullying at Follow-up and Psychopathologic Behavior History During 10 Months*

New-Onset Outcomes	Social Problems			Thought Problems			Aggression			Externalizing Problems		
	Baseline Only	Follow-up Only	Persistent	Baseline Only	Follow-up Only	Persistent	Baseline Only	Follow-up Only	Persistent	Baseline Only	Follow-up Only	Persistent
Victim	0.90 (0.09-8.68)	2.38 (8.59-6.58)	NA	NA	2.68† (1.21-5.95)	NA	NA	0.56 (0.07-4.28)	NA	NA	0.52 (0.07-3.95)	NA
Perpetrator	3.13† (1.13-8.69)	1.41 (0.57-3.50)	NA	2.82 (0.54-14.67)	1.12 (0.51-2.48)	9.55† (1.17-77.79)	NA	3.30‡ (1.56-6.99)	NA		11.90‡§ (2.26-62.55)	
Victim-perpetrator	NA	2.27 (0.49-10.57)	NA	NA	1.92 (0.53-6.97)	NA	9.47 (0.54-166.7)	2.15 (0.46-9.93)	NA	29.21† (1.62-525.3)	5.24‡ (1.57-17.46)	NA

Abbreviations: CI, confidence interval; NA, not applicable (cell size too small to compute OR); OR, odds ratio.

*The reference group had an absence of psychopathologic behavior for the 10-month study period. The ORs were adjusted for sex, grade, family structure, parental educational level, residence, and socioeconomic status. Data are presented as OR (95% CI).

†$P<.05$.

‡$P<.01$.

§Significant interaction was observed between follow-up–only exposure and female.

victim-perpetrator increased risks for aggression (OR, 4.9) and externalizing problems (OR, 4.6) at follow-up. When baseline psychopathologic behavior was adjusted in the analyses, the profiles of associations did not change except for a loss of precision, leading the risk of follow-up aggression among perpetrators to include the null value (Table 1).

Effects of Exposure History on the New Onset of Outcomes at Follow-up

Hypothesis 1: Psychopathologic Behavior as a Cause of Bullying. Among psychopathologic behaviors that were present only at baseline (path 1), social problems increased the risk of becoming a new perpetrator (OR, 3.1), and externalizing problems increased the risk of becoming a new victim-perpetrator (OR, 29.2), compared with students who did not have these problems during the 10-month period. On the other hand, thought problems (OR, 2.7), aggression (OR, 3.3), and externalizing behaviors (OR, 5.2) present only at follow-up (path 3) increased the risk of becoming a new victim, perpetrator, or victim-perpetrator. Persistent thought problems (path 2) increased the risk of becoming a perpetrator 9.6-fold. There was a significant interaction between sex and baseline externalizing problems in the risk of becoming a new perpetrator. Only female students with externalizing problems at follow-up were at significantly greater risk for becoming a new perpetrator at follow-up (OR, 11.9) (**Table 2**).

Hypothesis 2: Psychopathologic Behavior as a Consequence of Bullying. Compared with students who were not involved with bullying during the 10 months, being a victim only at the baseline (path 1) increased the risk of developing new social (OR, 2.7) and externalizing (OR, 2.8) problems. Being a victim only at follow-up (path 3) increased the risk of developing new thought problems (OR, 2.5). Finally, being a persistent victim (path 2) increased the risk of developing new somatic symptoms (OR, 2.7) and social problems (OR, 8.7).

Being a perpetrator, either at follow-up only (path 3) or persistently (path 2), increased the risk for new-onset aggression, with ORs of 3.1 and 3.5, respectively. Additionally, a significant interaction was found between sex and perpetrator in the risk of developing new externalizing problems. Only female students who were perpetrators at follow-up had increased risks for new externalizing problems (OR, 12.3).

Being a victim-perpetrator at follow-up only (path 3) increased the risk for new-onset externalizing problems (OR, 5.2). Also, being a persistent victim-perpetrator (path 2) increased the risk for onset of new social (OR, 5.6) and externalizing (OR, 5.9) problems (**Table 3**).

COMMENT

This study yielded 3 principal findings concerning the relations between bullying and psychopathologic behavior.

PSYCHOPATHOLOGIC BEHAVIOR AS A CONSEQUENCE OF EXPERIENCING BULLYING

Evaluating causality in a methodologically sound study, we examined 2 competing hypotheses (ie, psychopathologic behavior causes vs is the result of bullying) in a 10-month prospective study. Results supported the finding that psychopathologic behavior is a consequence rather than a cause of bullying. This causal relationship is supported by the strength of the association, the clear temporal antecedence, and the specificity of the association between bullying and psychopathologic behavior.

In addition to an overall adverse effect of bullying exposure, analyses that examined exposure history further supported the conclusion that psychopathologic behavior results from, rather than predisposes individuals to, bullying experiences. Tables 2 and 3 indicate that most forms of psychopathologic behavior that lead to new bullying at follow-up were also present at follow-up (Figure 2A, path 3), making it impossible to distinguish the temporal sequence of the 2 variables and determine their causal relationship. On the other hand, most forms of new-onset psychopathologic behavior at follow-up were

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Table 3. Association Between New-Onset Psychopathologic Behavior at Follow-up and Bullying History During 10 Months*

	Victims			Perpetrators			Victim-Perpetrators		
New-Onset Outcomes	Baseline Only	Follow-up Only	Persistent	Baseline Only	Follow-up Only	Persistent	Baseline Only	Follow-up Only	Persistent
Somatic symptoms	1.13 (0.42-3.02)	0.97 (0.28-3.34)	2.67† (1.18-6.01)	0.62 (0.21-1.81)	1.83 (0.80-4.18)	1.92 (0.87-4.26)	0.69 (0.08-5.76)	1.93 (0.40-9.32)	0.76 (0.10-6.03)
Social problems	2.71‡ (1.28-5.77)	2.36 (0.87-6.41)	8.73§ (4.55-16.73)	0.33 (0.08-1.42)	1.33 (0.54-3.30)	0.48 (0.11-2.06)	2.47 (0.52-11.68)	2.27 (0.50-10.40)	5.62‡ (1.86-16.98)
Thought problems	1.27 (0.58-2.80)	2.49† (1.13-5.49)	1.10 (0.45-2.71)	1.52 (0.75-3.08)	1.13 (0.51-2.50)	1.11 (0.45-2.71)	0.67 (0.09-5.29)	2.09 (0.57-7.62)	NA
Aggression	2.31 (0.96-5.56)	0.52 (0.07-3.96)	0.71 (0.16-3.10)	1.38 (0.55-3.42)	3.08‡ (1.46-6.46)	3.48‡ (1.55-7.82)	2.61 (0.55-12.37)	2.53 (0.54-11.76)	3.70 (0.98-14.03)
Externalizing problems	2.80† (1.25-6.27)	0.50 (0.07-3.77)	0.91 (0.26-3.11)		12.30‡‖ (2.30-65.84)		2.05 (0.43-9.74)	5.23‡ (1.59-17.25)	5.89‡ (1.92-18.12)

Abbreviations: CI, confidence interval; NA, not applicable (cell size too small to compute OR); OR, odds ratio.

*The reference group had an absence of bullying for the 10-month study period. The ORs were adjusted for sex, grade, family structure, parental educational level, residence, and socioeconomic status. Data are presented as OR (95% CI).

†$P<.05$.

‡$P<.01$.

§$P<.001$.

‖Significant interaction was observed between follow-up–only exposure and female.

associated with an antecedent bullying experience, either at baseline (path 1) or persistently throughout 10 months (path 2). These findings provided further evidence that the bullying experience caused the onset of new symptoms of later psychopathologic behaviors.

Having social problems may be both a cause and a consequence of victimization, but there are stronger indications that it is a consequence. Adolescents with social problems are more likely to be victimized, and in turn, being isolated from their peers, victimized adolescents are deprived of opportunities for age-appropriate social interaction, leading to the further worsening of social problems.

Our lack of finding a relation between bullying and anxious/depression is inconsistent with previous reports of positive associations.[13,19,20] Our contrary finding can be interpreted in several ways. First, the apparent lack of an association could be the result of differences in measurement of emotional difficulties by different instruments. The K-YSR's anxious/depressed subscale does not measure depression as a diagnostic entity per se but rather measures a mixture of emotional symptoms of anxiety and depression. Second, the differences in the bullying classification in this study may have contributed to our different findings. Differences in bullying classification in this study included (1) 3 types of bullying (victim, perpetrator, and victim-perpetrator) rather than the 2 types (victim and perpetrator) that have been used in most previous studies, and (2) we used an SPN cutoff score of 1 rather than median scores, 1% SD, or upper quartile. Thus, victims in this study were different from those in previous studies in that they were only victimized and did not engage in perpetrating behaviors. The difference in the cutoff point may have caused us to include a wider range of victimization severity. The same may be true for perpetrators. Third, the finding may be uniquely attributable to the Korean population. A final explanation is that previous findings that reported an association between depression and bullying may have been biased because of the cross-sectional nature of those studies, shared method variance, or other analytic shortfalls. These must be explored further in future studies with other study populations.

VICTIM-PERPETRATORS AS THE MOST VULNERABLE GROUP

Victim-perpetrators stand out as the group with the greatest risk of developing multiple psychopathologic behaviors. Previous studies[18,21] have consistently reported stronger associations in multiple areas of poor psychosocial function in victim-perpetrators than in other school bullying groups. These findings suggest that victim-perpetrators may be a distinct group of the most troubled among all students involved with bullying. It is difficult to explain the present findings by the severity of the bullying behaviors in the victim-perpetrators, since the profiles of the psychopathologic behavior that resulted from experiencing bullying differ in the 3 bullying groups. Rather, these finding support the uniqueness of the victim-perpetrator group compared with other aggressive or victimized children in many ways.[22]

INCREASED RISK AMONG GIRLS OF ADVERSE OUTCOMES IN THE RELATION BETWEEN EXTERNALIZING PROBLEMS AND BEING PERPETRATORS

Female students who became perpetrators at follow-up were at greater risk for developing new-onset externalizing problems, and female students who developed externalizing problems at follow-up were at greater risk for becoming new-onset perpetrators when compared with male students. Sex has been a well-established independent risk factor for both bullying and externalizing problems. Usually, being female places an individual at lower risk of involvement with externalizing problems and perpetration. However, in the present study, findings suggest that those rare girls who become perpetrators are more likely to engage in externalizing behavior than are boys who are perpetrators. This interaction between sex and

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involvement as a perpetrator and in externalizing problems bears further investigation.

This study demonstrates that bullying is a strong risk factor for the later development of psychopathologic behaviors. This observation is possible owing to our prospective design, multiple informants, analytic approaches controlling for important confounders, and large number of study participants with minimal loss to follow-up. Limitations include measures of symptoms of psychopathologic behavior based on only self-report rather than clinical examination. Additionally, although the study participants were from 2 middle schools in the Korean community, this was not an epidemiologic sample, possibly limiting the generalizability of the study findings. In addition, the follow-up period was only 10 months. These drawbacks limited the opportunity to observe the trajectories of psychopathologic behavior and bullying as well as their relationship to one another. Finally, there is a potential bias from unmeasured confounders such as pubertal stage, parental rearing practices, family stress, and genetics, which are ubiquitous problems for most observational studies.[23] Despite its limitations, this study shows that experiencing bullying in adolescents is a serious public health problem, not only because of the inherent problems of bullying itself but also because bullying seems to be clearly related to the development of later psychopathologic behaviors.

Once again, conventional wisdom appears to be vulnerable to systematic observation and data. Our results suggest that the seemingly "normal" behavior known as bullying, although demonstrably and arguably common, is anything but normal. Bullying not only is an antecedent of youth violence but also has serious consequences of its own, with far too many involved among our nation's youth. Not only are students exposed to unnecessary violence, but they are also placed at undue risk for developing psychopathologic behaviors as a result of the exposure. With a prevalence of 9% to 54%, bullying is internationally endemic and, based on the findings of this study, a public health problem worthy of our most intensive efforts at prevention and intervention.

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Author Affiliations: Child Study Center, Yale University School of Medicine, New Haven, Conn (Dr Kim); Department of Psychiatry, Hallym University, Anyang, South Korea (Dr Kim); Center for Child Mental Health and Developmental Neuroscience Institute for Juvenile Research and College of Medicine, the University of Illinois at Chicago (Dr Leventhal); the Korea Institute for Children's Social Development, Seoul, South Korea (Dr Koh); and School of Public Health (Drs Hubbard and Boyce) and Harold E. Jones Child Study Center, Institute of Human Development (Dr Boyce), University of California, Berkeley. Dr Boyce is now with the Department of Pediatrics, University of British Columbia, Vancouver.
Correspondence: Young Shin Kim, MD, MS, MPH, PhD, Child Study Center, Yale University School of Medicine, 230 S Frontage Rd, New Haven, CT 06520-7900 (young-shin.kim@yale.edu).
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