ARTICLE

Bullying Victimization Uniquely Contributes to Adjustment Problems in Young Children: A Nationally Representative Cohort Study

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ABSTRACT

OBJECTIVE. It has been shown that bullying victimization is associated with behavior and school adjustment problems, but it remains unclear whether the experience of bullying uniquely contributes to those problems after taking into account preexisting adjustment problems.

METHODS. We examined bullying in the Environmental Risk Study, a nationally representative 1994–1995 birth cohort of 2232 children. We identified children who experienced bullying between the ages of 5 and 7 years either as pure victims or bully/victims. We collected reports from mothers and teachers about children's behavior problems and school adjustment when they were 5 years old and again when they were age 7.

RESULTS. Compared with control children, pure victims showed more internalizing problems and unhappiness at school when they were 5 and 7 years. Girls who were pure victims also showed more externalizing problems than controls. Compared with controls and pure victims, bully/victims showed more internalizing problems, more externalizing problems, and fewer prosocial behaviors when they were 5 and 7 years. They also were less happy at school compared with control children at 7 years of age. Pure victims and bully/victims showed more behavior and school adjustment problems at 7 years of age, even after controlling for preexisting adjustment problems at 5 years of age.

CONCLUSIONS. Being the victim of a bully during the first years of schooling contributes to maladjustment in young children. Prevention and intervention programs aimed at reducing mental health problems during childhood should target bullying as an important risk factor.

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Abbreviation
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THE PAST 2 decades have witnessed growing concerns from parents, school staff, and community mental health services about young children being involved in bullying.[1,2] These concerns are partly fed by media reports about children who were severely injured or who committed suicide after being victimized by bullies. Although such extreme consequences are rare, recent research has shown that children who are bullied manifest adjustment problems, including internalizing disorders,[3] externalizing disorders,[4,5] social difficulties,[6–8] physical health problems,[9,10] and suicide ideation.[11] If bullying contributes to adjustment problems in childhood, then it should be a prime target for research and intervention, because it is such a widespread phenomenon among children; recent surveys in the United States, the United Kingdom, and several other European countries have indicated that rates of involvement in bullying vary across countries and can affect up to half of the youth.[12–14] Therefore, interventions to reduce bullying victimization could help prevent adjustment problems in young children.

Questions remain as to whether bullying victimization actually causes adjustment problems in children. Indeed, being the victim of a bully may not be a random process, as some children may evoke, or may reinforce aggressive encounters because of the way they behave. Studies have shown that children manifesting symptoms of depression,[15] emotional problems,[16] low self-regard, and poor social skills[17] have an increased risk of becoming victims of bullying. Thus, adjustment problems in young victims of bullies could be the continuation of problems that existed before bullying victimization. To ascertain whether bullying uniquely contributes to mental health problems, we need to take into account preexisting maladjustment problems.

Previous studies have not yet been able to equivocally determine whether involvement in bullying leads to maladjustment in children. Most research on bullying has relied on concurrent assessments of bullying and children's maladjustment, thus preventing inferences about the direction of the observed association. A few studies have collected information on bullying at >1 assessment point, but they did not collect information about initial adjustment problems, they examined small groups of children, or they did not consider heterogeneity within children who are victims of bullying.[15,18–22] Victims of bullying can be classified into subgroups according to whether or not they bully others as well: pure victims are children who are solely victims of bullies, and bully/victims are children who are both victims of bullies and bullies themselves. Bully/victims form a contingent of children who are distinct from those who are solely victims, and they are the most problematic of all groups of children involved in bullying, showing pervasive and extreme behavioral problems.[5,6,13,14,23,24] To determine the extent to which being the victim of bullying in childhood uniquely contributes to adjustment problems among pure victims and bully/victims, the present study uses a longitudinal design with measures of children's maladjustment before their involvement in bullying at the beginning of formal schooling.

The goals of the present study are threefold. First, we asked whether groups of children who were victimized by bullies between the age of 5 and 7 years showed behavioral and school maladjustment at the point of outcome for this study, 7 years of age. This was undertaken by using measures of internalizing problems, externalizing problems, prosocial behavior, happiness at school, and academic performance, which were assessed when children were 7 years of age. Answers to this question would provide additional evidence, from a large representative sample of young children, that pure victims and bully/victims manifest psychosocial difficulties. Second, we asked whether children who were victimized by bullies between the ages of 5 and 7 years had already shown behavioral and school maladjustment at school entry. Measures of internalizing problems, externalizing problems, prosocial behavior, and happiness at school were also assessed when the children began school, at 5 years of age. Knowing the characteristics of children who later become pure victims of bullies or bully/victims can help guide prevention strategies. Third, we asked whether being victimized by bullies uniquely contributed to victims' and bully/victims' behavioral and school adjustment problems, taking into account preexisting adjustment problems. If being victimized by bullies leads to or exacerbates adjustment problems in young children, after taking into account the confounding effect of previous difficulties, our study would support intervention programs that aim to control bullying behavior and limit the damage caused by bullying.

METHODS

Participants

Participants are members of the Environmental Risk (E-Risk) Longitudinal Twin Study, which investigates how genetic and environmental factors shape children's development. The sampling frame from which the E-Risk families were drawn was 2 consecutive birth cohorts (1994 and 1995) in a birth register of twins born in England and Wales.[25] Of the 15 906 twin pairs born in these 2 years, 71% joined the register. Bias from nonjoining was corrected, as described below.

The E-Risk Study probability sample was drawn using a high-risk stratification strategy. High-risk families were those in which the mother had her first birth when she was ≤20 years of age. We used this sampling (1) to replace high-risk families who were selectively lost to the register via nonresponse, and (2) to ensure sufficient base rates of children at risk for problem behavior. Age at

first childbearing was used as the risk-stratification variable, because it was present for virtually all of the families in the register, it is relatively free of measurement error, and early childbearing is a known risk factor for children's problem behaviors.[26,27] The high-risk sampling strategy resulted in a final sample in which one third of study mothers constitute a 160% oversample of mothers who were at high risk based on their young age at first birth (13–20 years), whereas the other two thirds of study mothers accurately represent all mothers in the general population (aged 13–48 years) in England and Wales in 1994–1995 (estimates derived from the General Household Survey).[28] The study sought a sample size of 1100 families to allow for attrition in future years of the longitudinal study while retaining statistical power. An initial list of families who had same-gender twins was drawn from the register to target for home visits, with a 10% oversample to allow for nonparticipation. Of the families from the initial list who were eligible for inclusion, 1116 (93%) participated in home-visit assessments when the twins were 5 years old, forming the base sample for the study. Written informed consent was obtained from mothers and, with parent's permission, questionnaires were posted to the children's teachers, who completed and returned questionnaires for 94% of cohort children. All of the research workers visiting the families had university degrees in psychology, anthropology, or nursing. Each research worker completed a formal 15-day training program. The E-Risk Study received ethical approval from the Maudsley Hospital Ethics Committee.

A follow-up home visit was conducted when the children were 7 years old. Follow-up data were collected for 98% of the 1116 E-Risk families. At this follow-up, teacher questionnaires were obtained for 91% of the 2232 E-Risk twins (93% of those taking part in the follow-up).

Measures

Bullying Victimization

During interviews with mothers when children were 7 years of age, we asked questions about children's adverse experiences between ages 5 and 7 years. Mothers were asked whether either twin had been bullied by another child, responding "never" (0), "yes" (1), or "frequent " (2). A total of 17.3% of children had been bullied by the age of 7 years (N = 409), 4.2% frequently (N = 116). Examples of bullying victimization in the E-Risk sample included instances in which the mother reported that her child was being excluded from groups and games or cases in which a child was called names, because they/she/he did not have a father. Other cases involved children being smacked across the face everyday for a month, children being stabbed with a pencil, and children being beaten up. Mothers were also asked if the children suffered physical harm and psychological distress as a consequence of bullying. The bullying experiences reported by the mothers were not trivial: 41% of the bullied children suffered physical harm (eg, bruise, cut, and burn) and 66% suffered psychological harm (eg, bad dreams, tummy ache, and school avoidance). The test-retest reliability of bullying victimization was .87 using a sample of 30 parents who were interviewed twice, between 3 and 6 weeks apart.

Bullying Perpetration

As part of the age-7 assessment of children's disruptive behavior, we asked mothers and teachers whether children had been bullying others. Mothers reported that a total of 12.1% of children were bullies (N = 302), 1.4% frequently (N = 41). Teachers reported that 14.1% of children were bullies (N = 313), 0.9% frequently (N = 24). A child was considered to be a bully if it was reported by either source. A total of 519 children (21.6%) bullied others according to mothers and/or teachers.

Groups of Children Victimized by Bullies

We combined groups of children who have been victimized by bullies and children who have been bullying others to generate 2 distinct groups of victimized children. Pure victims (total: 14.4%; boys: 16.9%; girls: 12.2%) are children who have been victimized by bullies but who have not bullied others. Bully/victims (total: 6.2%; boys: 7.2%; girls: 5.3%) are children who have been victimized by bullies and have bullied others as well. Pure bullies were excluded from these analyses. Children not involved in bullying as either victims or bullies (total: 79.4%; boys: 76.0%; girls: 82.5%) were the comparison group.

Behavioral Adjustment

Internalizing and externalizing behaviors were assessed using the Child Behavior Checklist[29] for mothers and the Teacher's Report Form[30] for teachers. Mothers were given the instrument as a face-to-face interview, and teachers responded by mail. Both informants rated each item as being "not true" (0), "somewhat or sometimes true" (1), or "very true or often true" (2). The reporting period was 6 months before the interview. The internalizing problems total scale is the sum of items in the withdrawn, somatic complaints, and anxious/depressed scales including items such as "cries a lot," "feels too guilty," and "worries." Mothers' scores at 5 years of age ranged from 0 to 44 (mean ± SD: 8.35 ± 6.68), and teachers' scores ranged from 0 to 50 (mean ± SD: 5.85 ± 5.76). The internal consistency reliability of the mother and the teacher reports were .84 and .85, respectively. Mothers' scores at 7 years of age ranged from 0 to 43 (mean ± SD: 7.32 ± 6.21), and teachers' scores ranged from 0 to 46 (mean ± SD: 5.79 ± 6.01). The internal consistency reliability of the mother and the teacher

reports were .86 and .87, respectively. Children's externalizing problems total scale is the sum of items from the delinquency and aggression scales (minus the item that assessed bullying). Mothers' scores at 5 years of age ranged from 0 to 53 (mean ± SD: 11.69 ± 8.38), and teachers' scores ranged from 0 to 57 (mean ± SD: 4.85 ± 7.43). The internal consistency reliability of the mother and the teacher reports were .88 and .93, respectively. Mothers' scores at 7 years of age ranged from 0 to 51 (mean ± SD: 10.11 ± 7.85), and teachers' scores ranged from 0 to 53 (mean ± SD: 4.47 ± 9.10). The internal consistency reliability of the mother and the teacher reports were .88 and .94 respectively. Prosocial behavior was measured with 10 items from the Revised Rutter Scale for School-Age Children,[31,32] including items such as "tries to be fair in games" and "considerate of other people's feelings." Mothers' and teachers' scores at 5 years of age ranged from 0 to 20 (mean ± SD: 16.31 ± 3.28 and mean ± SD: 11.74 ± 4.86, respectively). The internal consistency reliability of the mother and the teacher reports were .76 and .92, respectively. Mothers' and teachers' scores at 7 years of age ranged from 0 to 20 (mean ± SD: 16.40 ± 3.32 and mean ± SD: 12.71 ± 4.80, respectively). The internal consistency reliability of the mother and the teacher reports were .80 and .93, respectively. For all measures of behavior adjustment, combined mother and teacher scales were used by summing ratings of the 2 informants.

School Adjustment

The items in the teacher questionnaire were supplemented with additional questions about the child's happiness at school (eg, "How happy is he/she?"). Teachers rated children's happiness in relation to their peers using a 7-point scale, ranging from "much less" (1) to "much more compared with other children in the classroom" (7). The sample mean scores at ages 5 and 7 years were 4.58 (SD: 1.04) and 4.66 (SD: 1.07), respectively. Questions about children's academic performance were also included in the teacher questionnaire when children were 7 years of age. Teachers were asked whether children's current mathematical and English performances were: (1) far below average, (2) somewhat below average, (3) average, (4) somewhat above average, or (5) far above average, compared with pupils of the same age. Scores were averaged across topics to give a global scale of school performance. The sample mean score on academic performance was 3.02 (SD: 0.93). Also at 7 years of age, children's reading abilities were individually tested using the Test of Word Reading Efficiency.[33] The Test of Word Reading Efficiency provides a quick assessment of sight word efficiency. The test measures the number of printed words the child can read aloud from a list in 45 seconds and provides an index of the size of children's reading vocabulary. Children's scores were converted to age-based standard scores (with a score of 100 = median). The children in this study had an average reading score of 105.90 (SD: 12.96).

Statistical Analyses

To provide unbiased statistical estimates that can be generalized to the population of British families with children born in the 1990s, all of the data reported in this article were corrected with weighting to represent the proportion of young mothers in that population. The sample weight was based on the inverse of the selection probability with an additional adjustment to make the weighted proportion of young mothers exactly equivalent to the overall proportion in the population (28%).[34]

We evaluated group differences at ages 5 and 7 years with a series of planned comparisons using sets of contrast codes[35] with children not involved in bullying as the comparison group. Statistical analyses of data were complicated by the fact that our twin study contained 2 children from each family, leading to nonindependent observations. As such, we analyzed data using standard regression techniques, but with tests based on the sandwich or Huber/White variance estimator,[36–38] a method available in STATA 8.2 (Stata Corp, College Station, TX).[39] This technique adjusts estimated SEs to account for the dependence in the data. Boys were significantly overrepresented in groups of victims ($\chi^2 = 6.18$; *degrees of freedom* = 1; $P < .01$) and perpetrators ($\chi^2 = 18.29$; *degrees of freedom* = 1; $P < .001$) of bullying. Therefore, group differences were examined controlling for the potential confounding effect of gender. Additional comparisons between bully/victims and pure victims were conducted using the lincom posthoc comparison procedure available in STATA 8.2.[39] This procedure evaluates the effect of the linear combination resulting in the differences between the estimates for bully/victims and the estimates for pure victims. We also calculated the effect sizes of the obtained group differences from the following formula: $d = mean(victimized) - mean(not\ victimized)/sample\ SD$. Operationally defined, d at 0.2 is a small effect size, d at 0.5 is a medium effect size, and d at 0.8 is a large effect size.[40]

We used regression analyses predicting age-7 behavior and school adjustment to assess the unique contribution of the experience of bullying for children's maladjustment. At the first step, we entered groups of children victimized by bullies between ages 5 and 7 years. At the second step, we entered the age-5 measure of behavior or school adjustment. If groups of children victimized by bullies were significantly more likely to have age-7 adjustment problems in the first step but not in the second step, this would indicate that the initial association was largely because of the presence of previous adjustment problems. The analyses were conducted separately for internalizing problems, externalizing problems, prosocial behavior, and happiness at school.

Results

Did Pure Victims and Bully/Victims Have Behavior and School Adjustment Problems at 7 Years of Age?

Children who were pure victims of bullying between the ages of 5 and 7 years had significantly more internalizing problems at age-7 outcome compared with control children not involved in bullying. They showed less prosocial behaviors, and, according to their teachers, they were less happy at school (Table 1). Girls who were pure victims had significantly more externalizing problems compared with controls, but boys did not. Pure victims were not different from controls with regard to academic performance or reading scores. Effect sizes ranged from 0.30 to 0.45.

Children who were bully/victims had significantly more internalizing problems than control children and pure victims at 7 years old, they had more externalizing problems, and they showed fewer prosocial behaviors. Bully/victims were significantly less happy at school compared with control children and pure victims, and they had significantly lower academic performance and lower scores on reading tests. Effect sizes ranged from 0.30 to 2.13.

Did Pure Victims and Bully/Victims Have Preexisting Behavior and School Adjustment Problems at 5 Years of Age?

Children who became pure victims of bullying between the ages of 5 and 7 years had significantly more preexisting internalizing problems compared with controls (Table 2), and they were less happy during their first year at school according to their teachers. Girls who became pure victims had significantly more externalizing problems compared with controls, but boys did not. Pure victims were not different from controls with regard to prosocial behaviors at 5 years old. Effect sizes ranged from 0.26 to 0.28.

Children who became bully/victims had significantly more internalizing problems (Table 2), more externalizing problems, and they showed fewer prosocial behaviors compared with both controls and pure victims. They were significantly less happy in their first year at school compared with controls but not compared with pure victims. Effect sizes ranged from 0.30 to 1.35.

Did Bullying Victimization Contribute to Age-7 Behavior and School Adjustment Problems Beyond Initial Age-5 Maladjustment?

Being victimized by bullies significantly contributed to increased behavior and school adjustment problems at 7 years of age, over and above age-5 measures of maladjustment (Table 3). Both pure victims and bully/victims had significantly more internalizing problems, more externalizing problems, fewer prosocial behaviors, and were less happy at school than controls at 7 years of age, even after taking into account their baseline behavior at 5 years of age.

Discussion

Research indicates that victimization is associated with mental health problems in adulthood.[41,42] Adult psychopathology has its roots in children's poor mental health,[43] and, therefore, it is important to verify whether victimization in early childhood is also associated with children's adjustment problems. The present longitudinal study sheds light on this issue by examining bullying victimization among young children. Two groups of children who have been victimized by bullies between ages 5 and 7 years showed different patterns of adjustment problems depending on whether they also bully others or not. Pure victims, children who were solely victimized by others, showed elevated internalizing problems, and they were unhappy at school. Girls who

TABLE 1 At Study Outcome After 2 Years in School: Standardized Mean Scores on Behavior and School Adjustment at Age 7 Years According to Groups of Children Victimized by Bullies Between Ages 5 and 7 Years

Variable	Control Group: Not Involved in Bullying	Groups of Children Victimized by Bullies									
	(N = 1387 [79.4%])	Pure Victims (N = 272 [14.4%])				Bully/Victims (N = 137 [6.2%])					
			vs Controls				vs Controls			vs Pure Victims	
	Mean (SD)	Mean (SD)	B	P	d[a]	Mean (SD)	B	P	d	B	P	d
Behavior adjustment											
Internalizing	−0.16 (0.87)	0.27 (1.01)	.44	.001	0.45	0.79 (1.36)	.95	.001	0.99	.52	.001	0.54
Externalizing											
Boys	−0.22 (0.69)	−0.08 (0.84)	.13	NS	0.15	1.82 (1.43)	2.04	.001	2.13	1.90	.001	1.99
Girls	−0.42 (0.56)	−0.20 (0.60)	.23	.001	0.35	0.54 (0.80)	.96	.001	1.54	.74	.001	1.19
Prosocial	0.19 (0.95)	−0.10 (0.96)	−.24	.001	0.30	−0.60 (1.02)	−.74	.001	0.81	−.50	.001	0.51
School adjustment											
Happiness at school	0.13 (0.97)	−0.21 (0.89)	−.33	.001	0.35	−0.50 (0.97)	−.62	.001	0.65	−.29	.01	0.30
Academic performance	0.10 (0.95)	−0.08 (1.02)	−.16	NS	0.18	−0.43 (1.08)	−.51	.001	0.54	−.35	.01	0.36
Reading tests	0.07 (0.97)	0.01 (1.02)	−.05	NS	0.06	−0.38 (0.97)	−.44	.001	0.46	−.40	.001	0.40

All analyses controlled for the potential confounding effect of gender. Except for externalizing behavior, a gender-bullying group interaction term did not yield significant improvement in the fit of models. Results are thus presented for the whole sample collapsed across gender for analyses. B indicates regression coefficients; NS, not significant.

[a] Differences between groups can be interpreted in terms of SD units (d), where d at 0.2 is considered a small effect size, d at 0.5 is a medium effect size and d at 0.8 is a large effect size.[40]

TABLE 2 **At School Entry: Standardized Mean Scores on Children's Behavior and School Adjustment at Age 5 Years According to Groups of Children Victimized by Bullies Between Ages 5 and 7 Years**

Variable	Control Group: Not Involved in Bullying (N = 1387 [79.4%])	Groups of Children Victimized by Bullies										
		Pure Victims (N = 272 [14.4%])				Bully/Victims (N = 137 [6.2%])						
			vs Controls				vs Controls			vs Pure Victims		
	Mean (SD)	Mean (SD)	B	P	d[a]	Mean (SD)	B	P	d	B	P	d
Behavior adjustment												
Internalizing	−0.08 (0.94)	0.18 (1.00)	.27	.001	0.26	0.53 (1.16)	.61	.001	0.62	.35	.01	0.35
Externalizing												
Boys	−0.08 (0.86)	−0.03 (0.92)	.05	NS	0.05	1.25 (1.35)	1.32	.001	1.35	1.27	.001	1.30
Girls	−0.33 (0.72)	−0.13 (0.82)	.20	.05	0.26	0.23 (0.87)	.56	.001	1.74	.36	.05	0.47
Prosocial	0.01 (1.00)	0.02 (0.94)	.06	NS	0.01	−0.28 (1.00)	−.26	.01	0.30	−.31	.01	0.31
School adjustment												
Happiness at school	0.11 (1.00)	−0.17 (0.88)	−.28	.001	0.28	−0.37 (0.92)	−.47	.001	0.49	−.20	NS	0.20

All analyses controlled for the potential confounding effect of gender. Except for externalizing behavior, a gender-bullying group interaction term did not yield significant improvement in the fit of models. Results are thus presented for the whole sample collapsed across gender for analyses. B indicates regression coefficients; NS, not significant.

[a] Differences between groups can be interpreted in terms of SD units (d), where d at 0.2 is considered a small effect size, d at 0.5 is a medium effect size and d at 0.8 is a large effect size.[40]

TABLE 3 **Groups of Children Victimized by Bullies Between Ages 5 and 7 Years: Associations Between Bullying Victimization and Behavior and School Adjustment Problems at Age 7 Years, Controlling for Preexisting Age-5 Adjustment Problems**

Age-7 Measures of Adjustment Problems	Control for Gender		Control for Gender and Age-5 Measures of Adjustment Problems	
	B (95% Confidence Interval)	P	B (95% Confidence Interval)	P
Internalizing behavior				
Pure victims	.44 (.30 to .57)	.001	.33 (.19 to .46)	.001
Bully/victims	.95 (.70 to 1.21)	.001	.69 (.49 to .90)	.001
Age-5 internalizing behavior			.43 (.38 to .48)	.001
Externalizing behavior				
Pure victims	.17 (.06 to .28)	.001	.11 (.02 to .19)	.01
Bully/victims	1.55 (1.31 to 1.80)	.001	1.06 (.88 to 1.25)	.001
Age-5 externalizing behavior			.50 (.45 to .55)	.001
Prosocial behavior				
Pure victims	−.24 (−.38 to −.09)	.001	−.22 (−.36 to −.09)	.001
Bully/victims	−.74 (−.93 to −.55)	.001	−.62 (−.81 to −.44)	.001
Age-5 prosocial behavior			.33 (.27 to .38)	.001
Happiness at school				
Pure victims	−.33 (−.47 to −.19)	.001	−.27 (−.41 to −.13)	.001
Bully/victims	−.62 (−.81 to −.43)	.001	−.55 (−.73 to −.36)	.001
Age-5 happiness at school			.19 (.13 to .24)	.001

B indicates regression coefficients.

were pure victims showed elevated externalizing problems. Bully/victims, a small group of children who were victimized by others and who bullied others, showed elevated internalizing problems, elevated externalizing problems, fewer prosocial behaviors, academic difficulties, and elevated scores on a scale assessing unhappiness at school. Bully/victims had higher levels of adjustment problems compared not only with children not involved in bullying but also compared with pure victims. Consistent with previous research,[5,6,13,14,23,24] our findings indicate that pure victims and bully/victims have distinct patterns of maladjustment. However, our study is the first to show that differences between bully/victims and pure victims were already in place at school entry. Moreover, despite preexisting behavioral and school difficulties, being victimized by bullies during their first 2 years at school uniquely contributed to an increase in adjustment problems among both pure victims and bully/victims.

Differences Between Groups of Victims of Bullying

Pure victims and bully/victims differed in several ways with regard to their behavior and school adjustment problems. First, behavioral problems of boys who were pure victims were limited to internalizing problems, whereas boys who were bully/victims showed a pattern of comorbid problems that included internalizing and externalizing problems. This difference is specific to boys, because girls who were pure victims showed comorbid internalizing and externalizing behavior prob-

lems, like the bully/victims. Second, pure victims did not show fewer prosocial behaviors at age 5, whereas bully/victims did. Contrary to bully/victims, pure victims had better interpersonal skills to establish social relationships at school entry. However, after being victimized by bullies, pure victims were not using these skills as much anymore. Third, bully/victims had higher levels of behavioral problems than pure victims. All of the group differences indicated that bully/victims had significantly higher levels of behavioral and school adjustment problems than pure victims. Fourth, at 7 years old, bully/victims had more academic difficulties compared with pure victims. These academic difficulties, in combination with being unhappy at school and not being prosocial with others, might have implications regarding bully/victims' risk of dropping out of formal education and engaging in illegal activities.

Among victims of bullying, bully/victims had the most pervasive and severe adjustment problems. Bully/victims have an increased risk for developing mental health problems as teenagers and adults, and, in part, this is because they were victimized by other children in childhood. This group, in particular, could benefit from early identification and intervention. Pure victims of bullying warrant close monitoring as they grow older. They show increased internalizing problems, a developmental risk for adolescent and adult depression, and they showed a decrease of their interpersonal skills. Although prosocial behaviors are not a marker of childhood psychopathology, they are known as a protective factor against juvenile delinquency.[44] Therefore, a lack of prosocial behavior may indicate an increased risk for later delinquent offending. This risk is especially high for girls who are pure victims, because they also had elevated externalizing problems.

Similarities Between Groups of Victims of Bullying

Pure victims and bully/victims were also similar in several ways with regard to their behavior and school adjustment problems. First, pure victims and bully/victims manifested symptoms of internalizing problems and had difficulties adjusting to school in their first years of formal education. This finding adds to a large body of evidence[3] indicating that victims of bullying experience negative affect. Our study shows that for both pure victims and bully/victims, their experience with bullying uniquely contributed to their emotional state. In addition, although pure victims and bully/victims may show signs of unhappiness at school for different reasons, both groups' successful development in the education system may be jeopardized because of bullying. Second, girls who were pure victims and bully/victims had externalizing problems. This finding and others[4] suggest that being bullied is not only associated with negative emotions but also with violence and harmful behavior toward others. Third, pure victims and bully/victims already showed behavioral and school adjustment problems before they experienced bullying between ages 5 and 7 years. This finding raises the possibility that some behaviors may evoke or reinforce aggressive encounters and possibly place some children in the position of being easy targets for bullies. Fourth, pure victims and bully/victims showed exacerbated behavioral and school adjustment problems at 7 years of age, even after control for preexisting problems. Our findings suggest that bullying uniquely contributes to symptoms of maladjustment among young children and that bullying has harmful consequences for the victims, whether or not they also bully others.

Limitations

Our study has some methological limitations. First, our measure of bullying victimization was mother-reported only and not supplemented by other sources of information. Thus, there is a possibility that we have underreported victimization, because some mothers may be unaware of the social experiences of their child. However, age trends indicate that young children tend to tell adults when they experience bullying.[45] Additional evidence against the underreporting of victimization in our sample are the prevalence rates of involvement in bullying in the E-Risk Study that closely match average rates across nationally representative samples of singletons from 25 countries.[14]

Second, our findings on bullying victimization may be specific to twins and can not be generalized to singletons for 3 reasons. First, there is a possibility that identical twins are more likely to be bullied because they are an unusual pair of physically similar individuals. However, monozygotic twins in the E-Risk sample were no more likely to be bullied than dizygotic twins: 15% monozygotic vs 14% dizygotic twins were pure victims, whereas 6% monozygotic vs 7% dizygotic twins were bully/victims. Second, the unique bond between twins may be a protective factor against becoming the target of bullies. Indeed, research indicates that bullies could be less inclined to pick on children who have a circle of friends or siblings.[46] The similarity between our prevalence rates with twins and studies of singletons argues against this assumption. Third, twins may have higher rates of behavioral problems compared with singletons. However, research in twin-singleton comparisons does not support this assumption.[47–53]

Third, although our results indicate a detrimental effect of bullying on behavior in young children, these results need to be replicated in other children of this age group and at later periods in their lives. The present findings span a 2-year period at the beginning of the school years and raise the possibility of detrimental or resilient profiles over a longer period of time. More studies are needed to delineate causal associations as the children grow older. We are reassessing the E-Risk chil-

dren's bullying experiences as they grow to age 10 and 12, which will allow us to examine causal associations in early adolescence. Our results indicate that bullying victimization in the early school years is an influential experience for a child's behavioral development and mental health problems.

We have demonstrated that, irrespective of children's early behavioral and school difficulties, being the victim of bullying during the very first years of schooling has a detrimental effect on children's adjustment; pure victims and bully/victims manifested a range of behavioral problems and school difficulties after experiencing bullying. We have shown that it is not children's previous maladjustment that can be blamed for all of the adjustment problems of children victimized by bullies but that the bullying itself is a significant contributor to behavior and school adjustment problems. Bullying could be regarded as a stressful life event that might influence children's normal development. This highlights the importance of enquiring about bullying in all young children during medical checkups and at school to prevent mental health problems. Health and education professionals would benefit from enhanced training on the assessment and intervention for victims of bullying. Actions should be taken by parents, school staff, and medical staff when children inform them about their experiences with bullying. Intervention programs aimed at controlling bullying in schools or in the community need to offer support and social training for the victims and to target bully/victims for intensive multicomponent interventions. Earlier identification of bully/victims may be particularly important for children's mental health-preventive input, because they show the most maladaptive patterns of behavior at the beginning of schooling.

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