Sticks and Stones May Break My Bones, but Names Will Make Me Feel Sick: The Psychosocial, Somatic, and Scholastic Consequences of Peer Harassment

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This study examined associations among peer victimization, psychosocial problems, physical symptoms, and school functioning across the 1st year in middle school. An ethnically diverse sample of urban 6th graders (N = 1,526) reported on their perceptions of peer victimization, psychosocial adjustment, and physical symptoms during fall and spring. Objective measures of school functioning (i.e., grade point average and absences) were also collected. In Model 1, peer victimization in the fall was associated with spring psychosocial maladjustment and physical symptoms, which in turn predicted poor spring school functioning. Model 2 suggested that psychosocial difficulties increase the risk of victimization, although physical symptoms did not predict victimization. No sex or ethnic group (African American, Asian, European American, and Latino) differences were found in the model structure or the strength of the path coefficients for either model, suggesting that the process is the same for boys and girls and students from different ethnic groups.

Based on self-reports, up to 75% of secondary-school students report having been the targets of peer harassment (e.g., name calling, hitting and kicking, rumors, and social exclusion) at least occasionally during school (e.g., Hoover, Oliver, & Hazler, 1992; Kaufman et al., 1999). In this study, we tested two models that assessed the temporal association between peer victimization and a number of negative adjustment correlates (psychosocial maladjustment, physical symptoms, and poor school functioning) across the first year of middle school.

Peer Harassment and Psychosocial Adjustment

Much of the research on peer victimization presumes that the experiences of peer intimidation are stressful and result in psychosocial maladjustment (see Card, 2003; Hawker & Boulton, 2000, for meta-analytic reviews). Experiences of peer harassment have been linked with increased depressive symptoms, social anxiety, and suicide risk (Boivin, Hymel, & Bukowski, 1995; Olweus, 1993; Rigby & Slee, 1999;

Slee, 1994) as well as elevated feelings of loneliness at school and decreased self-worth (Boivin et al., 1995; Graham & Juvonen, 1998; Kochenderfer & Ladd, 1996b).

Although researchers of peer harassment typically conceptualize victimization experiences as social stressors that lead to negative outcomes, the temporal sequence of peer harassment and psychosocial adjustment has been tested in only a handful of studies. Vernberg, Abwender, Ewell, and Beery (1992) found that socially anxious youth were not more likely to be victimized than their nonanxious peers, but that peer victimization predicted subsequent feelings of social anxiety in middle school. Other studies suggest that internalizing symptoms and social withdrawal increase the risk for peer harassment (Egan & Perry, 1998; Olweus, 1993).

Peer Harassment and Physical Symptoms

There are fewer investigations examining the association between victimization and physical symptoms than psychosocial adjustment. Consistent with research on stressful life events and daily stress (e.g., Cobb & Steptoe, 1998; Compas, 1987), these studies suggest that peer harassment is related to physical symptoms or complaints (e.g., Kumpulainen et al., 1998; Rigby, 1999, 2000). For example, Williams,

Chambers, Logan, and Robinson (1996) found that British children who reported being harassed by peers "sometimes" or more frequently were 2.4 times more likely than their nonvictimized peers to report headaches or stomachaches to a school nurse. In a sample of eighth- and ninth-grade Australian students, self-reports of peer victimization predicted physical complaints 3 years later, even after controlling for initial levels of physical problems (Rigby, 1999). There have been no studies testing the reverse direction of these associations. Physical symptoms may be perceived as a sign of physical weakness, which has been found to be a risk factor for subsequent victimization (Hodges, Malone, & Perry, 1997).

Peer Harassment and School Adjustment

In addition to being associated with psychosocial maladjustment and physical complaints, peer victimization also predicts school adjustment problems (Boulton & Underwood, 1992; Kochenderfer & Ladd, 1996a, 1996b; Ladd, Kochenderfer, & Coleman, 1997; Whitney & Smith, 1993). However, in many of these empirical studies, school adjustment has been predominantly measured by children's self-reports of school attitudes (e.g., school liking). When more objective measures of school performance have been employed, the direct association between school adjustment and victimization is less robust (Juvonen, Nishina, & Graham, 2000; Kochenderfer & Ladd, 1996a). It may be that peer harassment is indirectly related to school performance via psychological adjustment problems (e.g.,

Juvonen et al., 2000) and physical symptoms. These adjustment problems may in turn interfere with students' ability to focus in class or prompt them to stay away from school (i.e., excused or unexcused absences; National Center for Education Statistics, 2002; Slee, 1994), resulting in missed learning opportunities at school.

This Study

The goal of this study was to test two alternative prospective models depicting the relations among peer harassment, physical and psychosocial problems, and school functioning across the first year in middle school (i.e., sixth grade). Consistent with a Peer Harassment as Stressor Model (see top half of Figure 1), we first tested whether psychosocial adjustment problems and physical symptoms mediate the association between peer victimization and later school functioning. In other words, peer victimization was conceptualized as a stressor that has consequences for physical well-being in addition to psychosocial adjustment, which in turn predict later compromised school functioning.

We also tested a prospective model in which psychosocial adjustment difficulties and physical complaints are considered risk factors for subsequent peer harassment. As illustrated in the bottom half of Figure 1, this model assesses whether poor psychosocial adjustment and physical symptoms during fall of sixth grade are associated with subsequent peer victimization, which in turn predict poor school functioning during the spring of sixth grade. Although psychologically
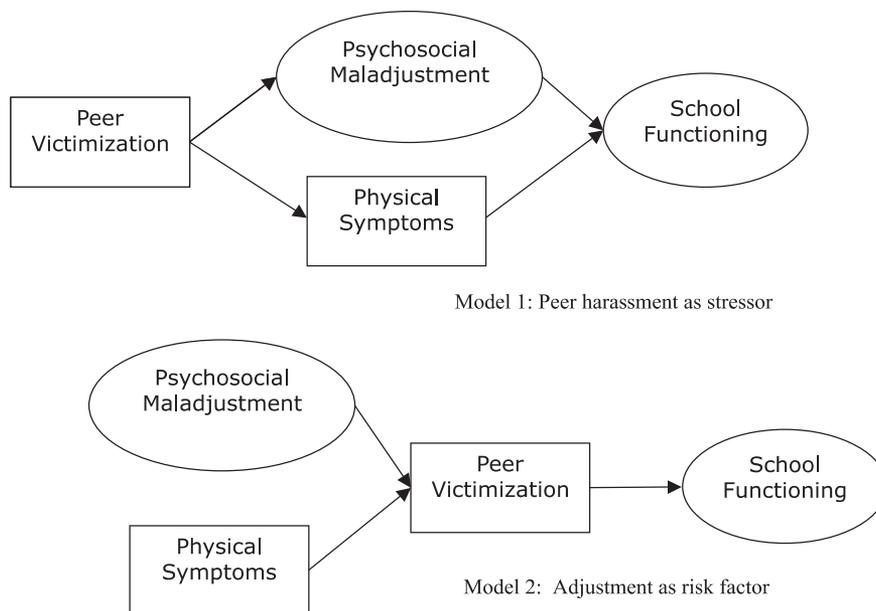

Model 1: Peer harassment as stressor

Model 2: Adjustment as risk factor

Figure 1. Conceptual mediational models depicting Peer Harassment as Stressor Model (Model 1) and Adjustment as Risk Factor Model (Model 2).

vulnerable youth may be easy targets (e.g., Egan & Perry, 1998), it is unknown whether youth who experience frequent physical symptoms are also viewed easy targets or whether victimization then is associated with compromised school functioning. To our knowledge, this is the first attempt to test prospective mediational models that include indexes of both psychosocial adjustment and physical well-being.

In both models, psychosocial maladjustment and school functioning were included as latent variables. Psychosocial maladjustment was indicated by self-reported depressive symptoms, social anxiety, loneliness, and low self-worth. Because school functioning involves more than just academic competence, our latent variable of school functioning was indicated not only by grade point average (GPA), but also by excused absences (e.g., those due to illness) and unexcused absences (tapping partly intentional avoidance) during the spring semester.

Because we had a large, diverse sample (approximately 1,500 middle-school students), we also tested for sex and ethnic group (African American, Asian, European American, and Latino) differences in the structure or pattern of associations among variables in the models. A number of studies have found mean level ethnic group differences for a number of constructs used in this study. For example, some researchers have documented that Hispanic or Latino (non-Cuban) youths reported higher levels of somatic symptoms than do European American youths (e.g., Pina & Silverman, 2004). Similarly, Fuligni (1997) found ethnic differences in academic performance with Latino youth performing more poorly than Asian youth. However, only a few studies on adolescent stress predicting behavioral or mental health outcomes have included tests of ethnic differences in the *associations* among variables (e.g., Deardorff, Gonzales, & Sandler, 2003; Galaif, Sussman, Chou, & Wills, 2003). In these studies, no ethnic group differences in the patterns of relations or processes have been found. Whether there are ethnic differences in these associations has implications for prevention and intervention measures.

Method

Participants

Participants were 1,526 sixth-grade students (45% boys) from a larger longitudinal sample of approximately 2,000 students (selection criteria is described later). The sample was predominantly of ethnic minority, comprised of 45% Latino (primarily Mexican and Central American), 26% African American, 11% Asian, 9% European American, and 8% from mixed ethnic backgrounds attending 11 urban, low-socioeconomic middle schools in the Los Angeles, California, area.

Procedure

In the fall, sixth-grade students were recruited from 99 classrooms distributed across 11 middle schools. To increase the informed consent form return rate, all students who returned their signed parent consent form, with or without parental permission to participate, were entered in a raffle (two prizes per class, approximately $5 each). Across the 11 participating schools, 75% of the 3,511 consent forms distributed to students were returned. Of those students who returned a signed parent consent form, 91% received permission to participate in the study. Only students with signed parent consent and student assent forms participated in the study.

During the middle of the fall and the middle of spring semester of sixth grade, students completed written questionnaires in a classroom setting. Before administering the questionnaire, at each time point students were informed about confidentiality. All instructions and items were read aloud while students privately recorded their own responses. At each data-collection point, students received a small token (e.g., a pen and eraser) and their classroom received $5 per student to be used for general classroom supplies. School record data (i.e., grades and aggregate attendance information) for the spring semester were collected for participating students.

Measures

Descriptions of the measured variables are presented in the following with Time 1 (T1) and Time 2 (T2) alphas, as well as T1 to T2 correlations indicating stability. Tables 1 and 2 present the means, standard deviations, and intercorrelations among the measured variables.

Peer victimization was measured using a modified version of Neary and Joseph's (1994) Peer Victimization Scale, which assesses self-perceptions of being the target of peer aggression. For the purposes of this study, it was important to rely on self-reported peer victimization, inasmuch as subjective perceptions of one's plight are more relevant than peer or teacher perceptions when examining psychological and physical well-being (Juvonen, Nishina, & Graham, 2001; Panak & Garber, 1992). This particular scale is worded in a manner similar to the Self-Perception Profile for Children (Harter, 1987) to limit social desirability bias. Items describe two types of hypothetical children (e.g., "Some kids are *not* called bad names by other kids, *BUT* other kids are *often* called bad names by other kids") and students are asked to decide "which type of kid is most like you." Students then determine whether

Table 1. *Correlation Matrix, Means, and Standard Deviations for Measured Variables Used in Model 1 (Peer Harassment as Stressor)*

	1	2	3	4	5	6	7	8	9
1. Peer victimization Time 1		.270*	.212*	.316*	−.309*	.228*	−.165*	.025	.069
2. Depression Time 2	.290*		.415*	.589*	−.672*	.403*	−.127*	.012	.029
3. Social anxiety Time 2	.239*	.433*		.489*	−.336*	.290*	−.007	.043	−.011
4. Loneliness Time 2	.343*	.502*	.426*		−.480*	.299*	−.068	.019	−.018
5. Self-worth Time 2	−.318*	−.645*	−.317*	−.419*		−.307*	.210*	.028	−.109
6. Physical symptoms Time 2	.271*	.523*	.291*	.310*	−.361*		−.165*	.120*	.093
7. GPA end of spring semester	−.200*	−.163*	−.070	−.093	.214*	−.175*		−.212*	−.280*
8. Excused absences end of spring semester	−.010	.054	−.081	−.084	−.026	.123*	−.210*		.146*
9. Unexcused absences end of spring semester	.016	.048	−.034	−.010	−.135*	.021	−.359*	.147*	
Initial sample mean	2.02	.25	2.19	1.68	3.22	1.71	2.66	2.42	1.23
Initial sample SD	.77	.30	.80	.58	.72	.55	.90	2.87	1.91
Validation sample mean	2.06	.25	2.15	1.69	3.23	1.71	2.64	2.72	1.32
Validation sample SD	.78	.32	.80	.63	.71	.53	.93	3.08	2.23

Note: Values below the diagonal are for the initial sample (*N* = 725), and values above the diagonal are for the cross-validation sample (*N* = 791).
*p < .001.

Table 2. *Correlation Matrix, Means, and Standard Deviations for Measured Variables Used in Model 2 (Adjustment as Risk Factor)*

	1	2	3	4	5	6	7	8	9
1. Depression Time 1		.481*	.512*	−.616*	.343*	.306*	−.128*	−.021	.045
2. Social anxiety Time 1	.508*		.475*	−.474*	.280*	.364*	−.027	−.012	.015
3. Loneliness Time 1	.569*	.523*		−.464*	.212*	.369*	−.099	.034	.033
4. Self-worth Time 1	−.628*	−.495*	−.476*		−.325*	−.372*	.151*	−.012	−.070
5. Physical symptoms Time 1	.431*	.329*	.364*	−.375*		.192*	−.149*	.045	.103
6. Peer victimization Time 2	.349*	.280*	.379*	−.303*	.283*		−.149*	.004	.052
7. GPA end of spring semester	−.119*	−.051	−.122*	.147*	−.196*	−.211*		−.212*	−.280*
8. Excused absences end of spring semester	.015	−.013	−.023	−.030	.075	−.009	−.210*		.146*
9. Unexcused absences end of spring semester	.004	−.072	−.005	−.010	.041	.076	−.359*	.147*	
Initial sample mean	.29	2.25	1.79	3.22	1.74	2.02	2.66	2.42	1.23
Initial sample SD	.31	.83	.62	.71	.52	.77	.90	2.87	1.91
Validation sample mean	.28	2.19	1.78	3.20	1.73	1.92	2.64	2.72	1.32
Validation sample SD	.32	.81	.64	.70	.55	.75	.93	3.08	2.23

Note: Values below the diagonal are for the initial sample (*N* = 725), and values above the diagonal are for the cross-validation sample (*N* = 791).
*p < .001.

it is "sort of true for me" or "really true for me." The measure includes two general victimization items, one verbal victimization item, and one physical victimization item. Two additional items were included to assess a broader range of peer-directed aggression: one that taps being the target of rumors and another that assesses for property damage or theft. A mean of the six items (scores range from 1 to 4) was calculated such that higher scores indicate stronger feelings of being victimized by peers (T1 α = .81, T2 α = .82; T1–T2 stability = .54, *p* < .001).

Physical symptoms were assessed by 12 items (modified from Resnick et al., 1997; Udry & Bearman, 1998) describing a variety of physical symptoms. Students are presented with a list of symptoms (e.g., "headaches," "upset stomach/nausea," "sore throat/coughs") and asked to rate how often they experienced each symptom in the past 2 weeks (rather than in the past 12 months). The rating scale ranges from 1 (*not at all*) to 4 (*almost every day*). A mean of the 12 items was com-

puted, with higher scores reflecting more physical symptoms (T1 α = .82, T2 α = .83; T1–T2 stability = .58, *p* < .001).

Psychosocial Maladjustment

To broadly assess psychosocial maladjustment, a latent variable indicated by measures of depressive symptoms, social anxiety, loneliness, and self-worth was used. The average intercorrelation among these four measures was high in both fall (average *r* = .52) and spring (average *r* = .48).

Depressive symptoms were measured using the 10-item short form of the Children's Depression Inventory (Kovacs, 1992). Students are presented with three sentences that describe "how kids might feel" and asked to indicate which sentence best describes how they have been feeling in the past 2 weeks. Scores range from 0 to 2; for example, 0 (*I do most things okay*), 1 (*I do many things wrong*), and 2 (*I do everything wrong*). The mean

of the 10 items was computed, with higher scores indicating a greater prevalence of depressive symptoms (T1 α = .80, T2 α = .82, T1–T2 stability = .60, $p < .001$).

Social anxiety was assessed using 9 of 12 items from the fear of negative evaluation and social avoidance and distress–general subscales of the Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998). Three items from the fear of negative evaluation subscale that could be construed as peer harassment were removed to avoid construct overlap. Items are rated on a 5-point scale ranging from 1 (*never true*) to 5 (*always true*). Examples are "I worry about what others think of me" and "I'm quiet when I'm with a group of people" for fear of negative evaluation and social avoidance and distress–general, respectively. A mean of the nine items was calculated such that higher scores reflect higher levels of self-reported social anxiety (T1 α = .82, T2 α = .84; T1–T2 stability = .52, $p < .001$).

Loneliness at school was assessed using Asher and Wheeler's (1985) Loneliness Scale. This 16-item scale taps loneliness specifically at school (e.g., "I have nobody to talk to in class"). Slight modifications were made to the scale to make it more age-appropriate. For example, "I don't have anyone to play with" was changed to "I don't have anyone to hang out with." For each item, students indicate how true the statement is for him or her, ranging from 1 (*That's not true at all for me*) to 5 (*That's always true about me*). A mean score was calculated, with higher scores indicating more loneliness at school (T1 α = .85, T2 α = .88; T1–T2 stability = .62, $p < .001$).

Self-worth was assessed using the six-item global self-worth subscale from Harter's (1987) Self-Perception Profile for Children. Students are presented with two types of individuals (e.g., "Some kids are often *unhappy* with themselves, *BUT* other kids are pretty *pleased* with themselves"). After students have decided which type of person best describes them, they are instructed to decide how true each item is for them, with scores ranging from 1 (*sort of true for me*) to 4 (*really true for me*). A mean of the six items was computed, with higher scores indicating higher levels of self-worth (T1 α = .79, T2 α = .80; T1–T2 stability = .54, $p < .001$).

School Functioning

To capture general school functioning at the end of spring semester, a latent variable indicated by spring GPA and excused and unexcused absences was used.

GPA reflects students' GPA across all of their classes during the spring semester. Grades for individual classes were scored on a 5-point scale ranging from 0 (*F*) to 4 (*A*), with higher scores reflecting better academic performance.

Excused absences during the spring semester were also collected. This score reflects the total number of school days a student had missed during the semester for which the student had provided some form of valid excuse for the absence. School-related absences (e.g., field trips) were not included in this measure.

Unexcused absences reflects the total number of school days a student missed during the spring semester for which he or she did not provide a valid excuse (e.g., the student failed to provide a parent note, truancy; and so on). Here, we collapsed across a number of absence codes provided by the school ("uncleared," "absent without a note," and "truant"), which in part accounted for the possibility that different schools favored using different codes for unexcused absences. The excused and unexcused absences were not strongly correlated ($r = .15$, $p < .001$).

Data Analytic Procedure

Structural equation modeling using AMOS 4.0 was used to test the fit of the proposed models. Structural equation modeling provides an advantage over more restricted statistical procedures because it allows for a complex model fit to be evaluated as a whole (Hoyle, 1995). For both hypothesized models, we assessed mediation (see Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) by using longitudinal data to test the models. By relying on different time points for the predictor, mediator, and outcome variables, we used a more stringent test of mediation than simply using concurrently collected data. Therefore, we included the predictor from the fall assessment and the mediator from the spring assessment, and the outcome always reflected the end of spring semester school functioning. Two latent variables were included in the model: (a) psychosocial maladjustment, indicated by depressive symptoms, social anxiety, loneliness, and self-worth; and (b) school functioning, indicated by spring semester GPA, number of semester excused absences, and number of semester unexcused absences. To have a properly identified model, one indicator of each construct needs to be fixed (i.e., value set to 1). In this case, the depressive symptoms measure was fixed for psychosocial maladjustment and GPA was fixed for school functioning.

Three different fit indexes were used: (a) chi-square fit index, (b) comparative fit index (CFI), and (c) root mean square error of approximation (RMSEA). The chi-square test assesses the model's "badness of fit," or the degree to which the proposed model deviates from the data. Here, nonsignificant p values are preferred. However, one of the major limitations of using chi-square to evaluate model fit is that it is sensitive to sample size: Larger samples increase the likelihood of obtaining significant p values (Bentler, 1990). The CFI (Bentler, 1990) ranges from 0 to 1 and assesses improvement in model fit of the tested model compared to an uncorrelated model. Values of .95 and above are

considered good fits (Hu & Bentler, 1999). Finally, the RMSEA is a fit index that takes into consideration the complexity of the model. Browne and Cudeck (1993) suggested that indexes of .08 and lower represent reasonable fit.

Because we had a sufficiently large sample size, we were able to randomly split the original sample into two subsamples (using the SPSS random selection option of approximately 50% of the sample) and use the second subsample as a cross-validation sample. A cross-validation sample addresses the problem that can arise in structural equation modeling of making data-driven post hoc modifications to the model. Consequently, the first subsample was used to test our hypothesized model and allow for conceptually reasonable modifications suggested by the data. The cross-validation sample was then used to test the modified model to determine whether it could be replicated. Failure to replicate would suggest that the modifications were probably due to idiosyncrasies in the data. Tables 1 and 2 (for Models 1 and 2, respectively) present the correlation matrix, means, and standard deviations of the measured variables for both the primary and cross-validation samples that were used in the analyses.

Of the original sample of approximately 2,000 participants, 381 participants were missing data on at least one of the fall or spring measured variables and thus were not included in the analyses. Many of the students eliminated (23%) were missing school record data (grades and absences), which were not missing at random. Moreover, students who were absent during data collection had missing data for all measured variables from that time point. Given that data were not missing at random, data imputation procedures were not appropriate when testing the models (Byrne, 2001).[1]

Students who were absent 20 or more total school days (i.e., at least 1 month of school) during either fall or spring semester of sixth grade were also eliminated from subsequent analyses. We presumed that these students represented a separate population of students who would not be able to provide reliable perceptions of victimization or loneliness at school. This specification eliminated 96 students (less than 5% of the total

sample).[2] With these constraints, the 1,526 students described in the Participants section remained in the analyses described in the following.

Results

This section is divided into three parts: (a) descriptive data on mean level sex and ethnic group differences, (b) description of Model 1 testing peer harassment as a stressor, and (c) description of Model 2 testing adjustment as a risk factor for peer harassment and subsequent poor school functioning. For both models, fit indexes with modifications are presented for the primary and cross-validation samples. Results from a multigroup analyses run with the primary sample to test for sex differences are also presented. Finally, to have a sufficient sample size to include all four ethnic groups, multigroup analyses (African American, Asian, European American, and Latino) testing for ethnic differences were run with the entire sample for both models.

Sex and Ethnic Group Differences

We tested for mean level sex and ethnic differences for each of the self-reported measured variables at each of the time points (fall and spring of sixth grade) and the school functioning indexes (spring semester of sixth grade) using a Bonferroni correction to adjust for the number of analyses conducted. Independent t tests revealed sex differences on only three variables. Girls reported significantly higher levels of social anxiety ($M = 2.28$, $SD = 0.84$) than did boys ($M = 2.21$, $SD = 0.79$; $t = –4.12$, $p < .001$) in fall of sixth grade. Girls also received higher spring semester GPAs ($M = 2.81$, $SD = 0.85$) than did boys ($M = 2.44$, $SD = 0.95$; $t = –7.92$, $p < .001$). Additionally, boys reported significantly higher levels of peer victimization ($M = 2.05$, $SD = 0.78$) than did girls ($M = 1.91$, $SD = 0.74$; $t = 3.60$, $p < .001$) during the spring semester of sixth grade.

One-way analyses of variance were run to test for ethnic group differences among African American, Latino, Asian, and European American students on each of the measured variables. Biracial and multiethnic students ($n = 124$) were excluded from the ethnic group analyses (but were retained in all other analyses) because of the diversity of ethnic group combinations that were reported by these students. An additional 14 students were not included in this set of analyses because

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[1]We tested for differences between students who had complete data at both times points and students who were missing at least one measured variable using independent t tests. When a Bonferroni correction was made for the number of tests conducted, there were significant differences for perceptions of victimization, loneliness, and self-worth measured in the fall semester. For spring semester variables, there were only significant differences between the two groups for unexcused absences and GPA. The direction of the effect was consistent across all variables. Students who were retained in the sample had worse adjustment on these measures than students who had some missing data. Hence, attrition due to incomplete data did not exclude the more extreme cases.

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[2]We tested for differences between students removed from analyses because of excessive absences and students retained in the sample. After adjusting for number of tests run, there was only one significant difference (among all fall and spring semester measured variables). Students with more than 20 absences in spring semester had significantly lower GPAs ($M = 1.58$, $SD = 1.01$) than students with fewer absences ($M = 2.65$, $SD = .92$; $t = 5.64$, $p < .001$).

they did not report their ethnicity. As illustrated in Table 3, for both fall and spring analyses, few clear patterns of ethnic differences across the measured variables emerged. In general, European American students reported the lowest levels of peer victimization and African American students reported the lowest social anxiety levels. Asian students consistently received higher GPAs and had better attendance rates than the other students. No ethnic group differences were obtained for depression and self-worth at either time point.

It is important to note these mean level sex and ethnic group differences do not indicate whether there are sex or ethnic group differences in the factor structure (i.e., how the measured variables indicated the latent variables) or strength of the path coefficients (e.g., the degree to which the victimization predicted physical symptoms), which were our main questions of interest. Differences in model fit according to sex or ethnic group would suggest that the *process* works differently for boys and girls or for students from different ethnic groups. The results from these research questions are presented in the following.

Model 1: Peer Harassment as Stressor

A longitudinal model was tested in which fall semester perceptions of victimization predict spring reports of psychosocial problems and physical symptoms, which in turn predicts school functioning at the end of the spring semester. The predictor, mediators, and outcome can be viewed as representing distinct time points because the spring self-report measures were collected only partway through the spring semester, whereas the objective measures of school functioning reflected performance during the entire spring semester. We did not control for T1 of the intervening variables because we were interested in the persistence of the relations over time rather than predicting change. After conducting preliminary analyses with the primary sample, correlated errors were added between psychosocial problems and physical symptoms and between social anxiety and loneliness. It is not surprising that psychosocial problems and physical symptoms would be related, given that youth who report internalizing problems also report somatic complaints (e.g., Achenbach, 1991). Similarly, social anxiety and loneliness may be related given the social nature of the variables. The final model with two correlated errors yielded a good fit with both the primary ($n = 725$ after removing seven multivariate outliers) and cross-validation ($n = 791$ after removing three multivariate outliers) samples: CFI = .935 (.952 for the cross validation sample); RMSEA = .074 (.064); $\chi^2(23) = 114.12$, $p < .05$ (96.28, $p < .05$).

As illustrated in Figure 2, perceived peer victimization at the beginning of sixth grade significantly predicted higher levels of psychosocial problems (βs = .38, .36 for cross-validation sample) and physical symptoms (βs = .27, .23), ps < .001, in spring of sixth grade. Psychosocial problems in the spring was associated with spring semester school functioning ($\beta = -.19$, $p < .01$; $-.12$, $p < .05$). Similarly, spring physical symptoms predicted spring semester school functioning (βs = $-.10$, $p < .10$; $-.20$, $p < .01$). A test of indirect effects was significant for both samples (ps < .01), indicating that self-perceived victimization at the beginning of sixth grade *indirectly* affected students' school functioning at the end of the spring semester of sixth grade.

Table 3. *Means and Standard Deviations of Measured Variables by Ethnic Group*

	African American		Latino		Asian		European American	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Fall semester								
Peer victimization	2.12	.78$_{bc}$	2.11	.79$_c$	1.95	.71$_{ab}$	1.79	.70$_a$
Depression	.27	.33$_a$	.31	.32$_a$	.30	.30$_a$	.25	.33$_a$
Social anxiety	2.12	.85$_a$	2.27	.82$_b$	2.32	.83$_b$	2.07	.74$_a$
Loneliness	1.74	.63$_{ab}$	1.84	.64$_b$	1.86	.65$_b$	1.65	.62$_a$
Self-worth	3.24	.71$_a$	3.15	.72$_a$	3.23	.68$_a$	3.33	.71$_a$
Physical symptoms	1.82	.98$_b$	1.73	.53$_a$	1.65	.50$_a$	1.63	.51$_a$
Spring semester								
Peer victimization	2.03	.78$_b$	2.01	.77$_b$	1.84	.68$_a$	1.78	.74$_a$
Depression	.23	.32$_a$	.27	.30$_a$	.22	.26$_a$	.22	.33$_a$
Social anxiety	2.00	.83$_a$	2.19	.80$_b$	2.34	.77$_b$	2.14	.78$_{ab}$
Loneliness	1.63	.59$_a$	1.72	.60$_a$	1.78	.58$_a$	1.57	.66$_a$
Self-worth	3.27	.74$_a$	3.18	.72$_a$	3.27	.60$_a$	3.41	.68$_a$
Physical symptoms	1.73	.55$_a$	1.71	.53$_a$	1.61	.48$_a$	1.65	.52$_a$
GPA	2.32	.88$_a$	2.61	.89$_b$	3.23	.79$_d$	2.97	.82$_c$
Excused absences	2.94	3.12$_b$	2.53	2.93$_b$	1.17	2.12$_a$	3.19	3.28$_b$
Unexcused absences	2.26	2.51$_c$	1.09	2.02$_b$	.51	1.02$_a$	.88	1.67$_{ab}$

Note: $N = 443$ African American, 824 Latino, 196 Asian, and 162 European American for fall semester; $N = 347$ African American, 726 Latino, 169 Asian, and 137 European American for spring semester. Row means with different subscripts are significantly different at $p < .05$ using Tukey's test.
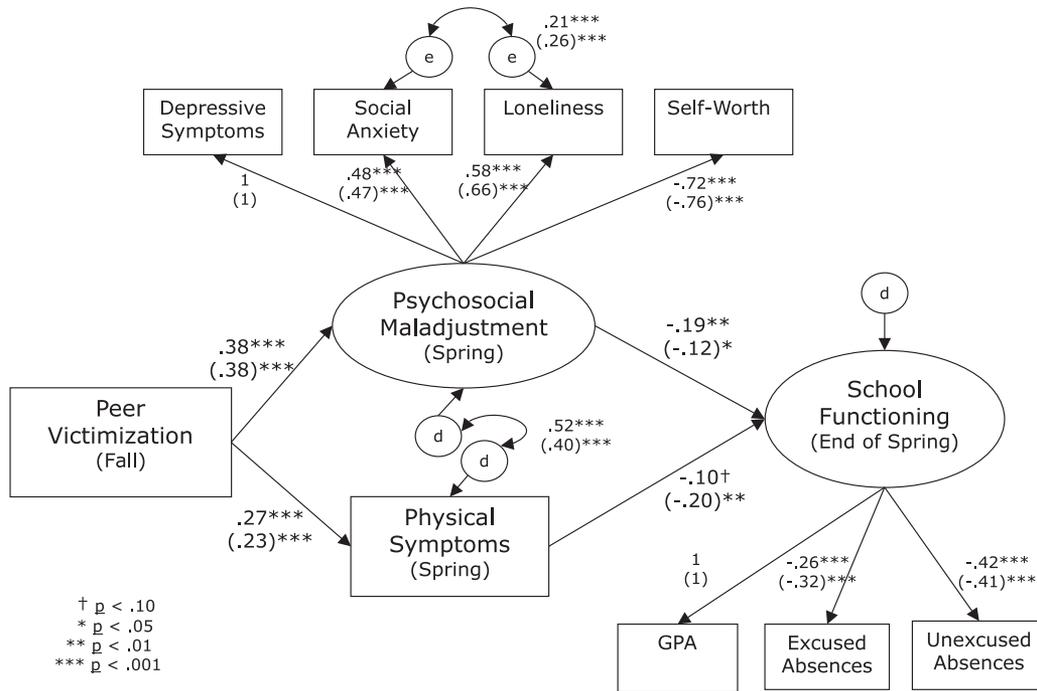
Figure 2. Model 1 with standardized factor loadings, path coefficients, and two correlated errors. Estimates for the primary sample (*n* = 725) are presented first, and estimates for the cross-validation sample (*n* = 791) are presented in parentheses. Error terms for measured variables (represented by *e*) when correlated with one another and error terms for latent variables (represented by *d*) are also depicted.

Multigroup analyses were run to test for sex and ethnic group differences. To test for sex differences, using data from the primary sample, all free parameters were constrained to be equal for boys and girls. This model was then compared to the model presented previously in which the parameters were not constrained. A nested chi-square difference test indicated that the model in which boys and girls were constrained to be equal did not yield a significantly worse model fit compared to the unconstrained model: χ^2 diff(34) = 37.03, *p* > .05. This suggests that there were no differences between boys and girls in the factor structure of the latent variables or the strength of the paths in the mediational model.

Given that there were a number of mean-level ethnic group differences in the measured variables, a similar multigroup analysis was run to test for ethnic group differences in the model. To have an adequate sample size for Asian and European American students, the primary and cross-validation samples were collapsed. As noted previously, biracial and multiethnic students were eliminated from this particular analysis. No ethnic group differences were found in the mediational or structural model: χ^2 diff(102) = 111.02, *p* > .05.

Model 2: Adjustment as Risk Factor

Model 2 tested whether fall psychosocial adjustment problems and physical symptoms predict school

functioning at the end of the spring semester indirectly through spring peer harassment. We retained correlations between psychological adjustment and physical symptoms to have the most comparable model to Model 1 presented previously. This model, using both the initial and cross-validation samples, yielded a somewhat better fit than Model 1: CFI = .969 (.962 for the cross-validation sample), RMSEA = .05 (.052), χ^2(25) = 71.15, *p* < .05 (78.30, *p* < .05). However, there is no test to statistically evaluate the difference in model fit between two nonnested models. As illustrated in Figure 3, psychosocial adjustment problems in the fall of sixth grade predicted higher levels of peer harassment in the spring (βs = .41, .49 for the cross-validation sample; *p*s < .001). In turn, spring levels of peer harassment predicted poorer school functioning at the end of the spring semester (βs = −.23, −.18; *p*s < .001). The indirect path between psychosocial maladjustment and school functioning was significant for both the primary and cross-validation samples (*p* < .01). However, physical symptoms in the fall of sixth grade did not predict increased spring peer harassment (βs = .07, −.01; *ns*), nor did fall physical symptoms indirectly lead to poorer school functioning at the end of the spring semester (*p* > .05).

As with Model 1, multisample analyses were run to test for sex and ethnic differences. Like the first model, nested chi-square analyses indicated no significant sex differences: χ^2 diff(29) = 40.57, *p* > .05. Similarly, no
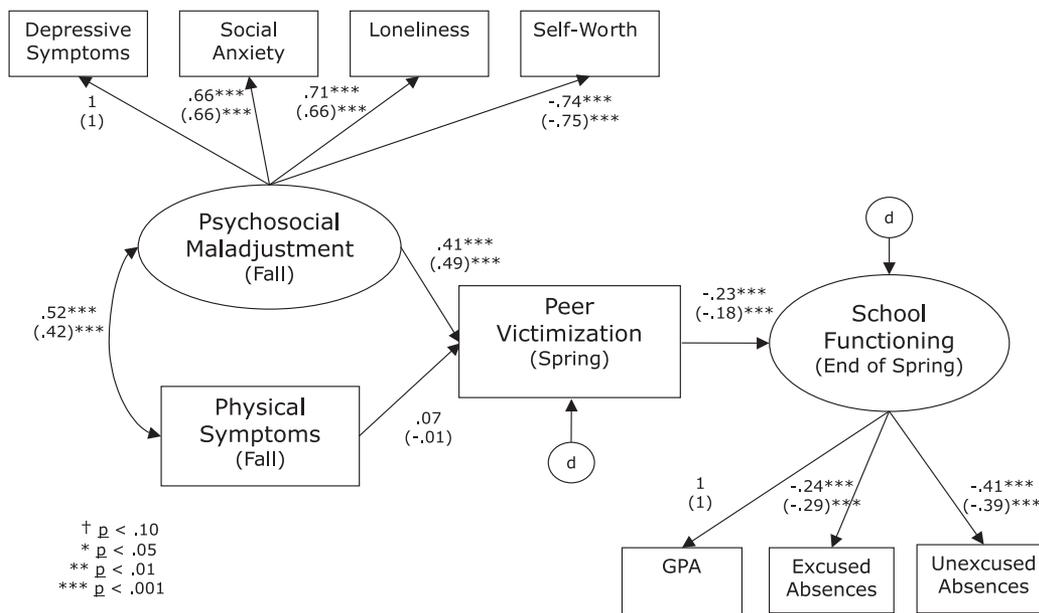
Figure 3. Model 2 with standardized factor loadings and path coefficients. Estimates for the primary sample ($n = 725$) are presented first, and estimates for the cross-validation sample ($n = 791$) are presented in parentheses. Error terms for latent variables (represented by d) are also depicted.

ethnic group differences were found among African American, Asian, European American, or Latino students: χ^2 diff(102) = 102.49, $p > .05$.

Discussion

This study supports the previously limited evidence for peer victimization both predicting and being predicted by previous psychosocial problems. In addition, the findings indicate that being the target of peer aggression and experiencing its psychosocial correlates can serve as direct and indirect stressors affecting school functioning over time.

Temporal Sequence of Victimization and Psychosocial Adjustment

Model 1 indicates that, similar to previous studies, psychosocial problems mediate the association between perceived peer harassment and school functioning. When students feel they are frequent targets of peer aggression, they feel more depressed, anxious, and lonely than students who do not view themselves as frequent targets. Students who report they get picked on also feel worse about themselves in general. Collectively, these internalizing symptoms and feelings of loneliness are likely to lead to students' disengagement from school. Avoidance of unpleasant social situations, which is frequently associated with symptoms of social anxiety and anhedonia

(American Psychiatric Association, 1994), as well as decreased energy, which is often associated with depression (American Psychiatric Association, 1994), may then lead to lower academic achievement and both excused and unexcused absences from school.

Model 2, in turn, suggests that psychosocial adjustment problems predict subsequent peer harassment, which in turn predicts later school functioning. This model also yielded a good fit, although physical symptoms do not predict school problems. The findings regarding the relation between victimization and psychosocial adjustment difficulties suggest that the association may be reciprocal. This conclusion is consistent with laboratory studies on peer interactions. For example, in a study of boys' contrived play groups, Schwartz, Dodge, and Coie (1993) found that, although socially submissive behaviors elevated the risk of peer victimization, victimization in turn increased socially submissive and withdrawn behaviors. It may be that students who exhibit the behavioral signs of internalizing problems are seen as "easy targets" who are unlikely to retaliate (Olweus, 1993). A reciprocal association between peer harassment and psychosocial adjustment (as suggested by Models 1 and 2) is also consistent with some researchers' notion of a transactional model of depression (e.g., Hammen, 1991, with adults; Rudolph et al., 2000, with a small sample of clinic-referred youth). This model proposes that, in some cases, depressed individuals may elicit stressful interpersonal experiences.

Temporal Sequence of Victimization and Physical Symptoms

Whereas the path between psychosocial adjustment problems during fall and physical symptoms during spring was statistically significant, the reverse was not true. In other words, experiencing peer harassment may make youth feel sick, but feeling sick did not increase the risk of being harassed. The mediational role of physical symptoms is a new contribution to the understanding of the negative proximal and distal consequences of peer harassment. Regarding physical symptoms, it may be that students who experience peer harassment are at risk for becoming physically ill. Eisenberger, Lieberman, and Williams (2003) found that, in adults, experiencing social rejection activates the same areas of the brain that register physical pain. Other research has found that stressful events—especially those that occur chronically—increase stress hormones (e.g., cortisol), which in turn suppress immune system functioning (see Kemeny, 2003; McEwen, 2000, for summaries). Thus, students who are targets of peer harassment may be more likely to get colds or other illnesses that prevent them from going to school.

Another explanation is that physical symptoms may be a more "socially acceptable" alternative for students to express themselves than some of the symptoms associated with psychological adjustment difficulties. That is, among young adolescents, it may be more acceptable to say that one is feeling sick rather than to admit that one is feeling nervous or sad. Although not directed at the *cause* of the symptoms, this positive social attention may help to ameliorate some of the negative consequences of a peer-harassment experience and may subsequently reinforce the expression of physical symptoms. Additionally, physical symptoms may elicit more positive social attention (e.g., sympathy or help) from adults and peers.

Experiencing physical symptoms may also provide a negative reinforcement cycle for students who are frequent targets of peer harassment if they miss class to go to the nurse's office or miss school because they are feeling sick. Both situations allow the student to avoid the negative stimuli (i.e., unpleasant social experiences) and could potentially become a maladaptive coping strategy. Although a similar negative reinforcement cycle could develop with the presentation of internalizing symptoms, school staff and parents are more likely to allow students to miss classes or school if they are feeling physically ill.

Although peer victimization predicted physical symptoms, high levels of physical symptoms did not predict subsequent harassment by peers. It may be that the display of physical illness, as opposed to physical weakness, limits the likelihood of becoming the target of peer aggression. That is, it may not be socially acceptable to be mean to youth who are feeling sick and,

consequently, others may more readily assist those who are feeling ill.

Sex and Ethnic Group Similarities

Given that there were only three statistically significant mean-level sex differences out of the 15 measured variables, it is not surprising that there were no sex differences in the factor structure or path coefficients for Model 1 or Model 2. The lack of sex differences in the strength of the paths in the model suggests that the same points of intervention could be used for both boys and girls. Likewise, the same points of intervention could be targeted for students from different ethnic groups. Consistent with previous research suggesting ethnic group differences in adjustment and academic performance (e.g., Fuligni, 1997; Pina & Silverman, 2004), there were mean level differences on almost all of the measured variables. However, in both models, there were no ethnic differences in the factor structure or path coefficients. That is, the indirect effect of perceived peer harassment on school functioning through psychosocial problems and physical symptoms is similar for African American, Latino, European American, and Asian students. Similarly, for Model 2, psychosocial adjustment problems predicted peer victimization equally for students from different ethnic backgrounds. These findings are not entirely surprising, given that peer harassment has been found to have similar psychological and behavioral correlates across a number of different cultures. Cross-culturally, being the target of peer aggression is associated with similar antecedents and consequences (e.g., Boivin et al., 1995; Boulton & Underwood, 1992; Matsui, Kakuyama, Tsuzuki, & Onglatco, 1996; Olweus, 1978; Perry, Kusel, & Perry, 1988; Rigby & Slee, 1991; Schwartz, Chang, & Farver, 2001).

Future Directions

In this study, we collected information about self-reported physical symptoms. Although these self-reports were related to victimization and school functioning, it is unclear whether negative peer experiences would be associated with more problems on objective measures of physical health. Obtaining objective physiological measures would provide additional support for the negative consequences of experiencing peer harassment. Such findings might also be more convincing to school personnel of the need to monitor and improve the social climate of their schools. Additionally, conceptual and statistical evidence suggests physical symptoms and psychosocial maladjustment are separate constructs (e.g., they do not perform in the same manner in both models). However, although the variables were associated in both models, the degree to which this correlation is due to shared method variance versus overlap between the constructs is an area of further research.

Another area for further exploration involves the nature of the attendance information. Because we obtained only aggregate attendance information, we were unable to determine whether the absences were staggered or clustered. Clustered absences might be more indicative of prolonged illness or family vacations, whereas staggered absences may be more indicative of frequent minor illness (e.g., colds) or parent-approved school avoidance.

Finally, although there were no sex or ethnic group differences in the models tested in this study, there may be other important subgroups of students to consider in future research. For example, aggressive-victims (i.e., those students who are both aggressive toward peers and the targets of peer aggression) may be one such subgroup. For these students, different pathways may exist that ultimately predict poor school performance. It is also possible that differential adjustment outcomes may be found for students who are primarily victims of certain types of harassment. Although we did not test for this in this study because the measure of peer victimization used was designed to tap feelings of victimization at a more global level, other research suggests that students (both boys and girls) are equally distressed regardless of the type of victimization they experience (Nishina & Juvonen, in press). Additionally, when students' peer victimization is measured via peer reports, the correlations between types of victimization tend to be very high (i.e., rs > .75), suggesting that, at least in elementary and middle school, victimization is a unidimensional construct (Paul & Cillessen, 2003).

Implications

The findings from this study suggest that peer victimization experiences at school have implications for academic performance. The collective findings from Models 1 and 2 offer likely points of intervention. For example, Model 1 suggests that schools could strive to limit the amount of victimization that occurs on campus. Alternatively, interventions focusing on limiting the impact of victimization on adjustment, such as teaching adaptive coping strategies, may also help to improve school functioning. Both Models 1 and 2 also suggest that intervening with students' psychological well-being may both improve school functioning as well as limit the students' risk of becoming the target of peer aggression.

Collectively, the findings from this study also suggest that victims may not always come to the attention of school personnel via school counselors or mental health professionals. School nurses and school-based health centers may encounter students who frequently have physical complaints that are related to peer victimization experiences. Thus, these professionals should assess for social problems as a possible antecedent of frequent nurse visits or physical complaints. Collaboration among school professionals (i.e., teachers, nurses, psychologists, and counselors) may be warranted to prevent school avoidance from being reinforced.

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