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Peer Victimization During Middle Childhood as a Lead Indicator of Internalizing Problems and Diagnostic Outcomes in Late Adolescence

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We examined evidence that peer victimization in middle childhood is a lead indicator of internalizing behavior problems and diagnostic outcomes during adolescence. This research was conducted as part of an ongoing multisite longitudinal investigation. The participants were 388 children (198 boys, 190 girls). Peer victimization was assessed with a peer nomination inventory that was administered when the average age of the participants was approximately 8.5 years. Internalizing problems were assessed using a behavior problem checklist completed by mothers in 9 consecutive years, and a structured clinical interview was administered to the participants in the summer following high school graduation (10–11 years after the victimization assessment). Peer victimization in middle childhood was correlated with internalizing problems on a bivariate basis through the late years of adolescence. Multilevel analyses also revealed associations between peer victimization and increases in internalizing problems over time. In addition, peer victimization had a modest link to unipolar depressive disorders in late adolescence. Victimization in the peer group during middle childhood appears to be a marker of long-term risk for internalizing behavior problems and unipolar depression.

Research on psychosocial adjustment of children who experience frequent verbal or physical mistreatment by peers has often focused on maladaptive outcomes that involve internalized distress. Investigators have described moderate links between peer victimization and symptoms of depression (Kumpulainen et al., 1998; Schwartz, Gorman, Nakamoto, & Toblin, 2005; Snyder et al., 2003), anxiety (Craig, 1998; Schwartz, 2000), loneliness and social withdrawal (Boivin, Hymel, & Bukowski, 1995). The initial work in this domain has provided compelling evidence of short-term associations (i.e., over 2- to 3-year periods) between victimization in the peer group and these forms of internalizing problems. Our goal in the present study is to build on the available findings by adopting a more long-term perspective. More specifically, we considered evidence that victimization in school during the middle years of childhood serves as a "lead indicator" of depression,

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anxiety, and related problems in the late adolescent to early adult years.

The concept of a lead indicator was originally derived from economic theory and denotes a construct that is not necessarily casual but can effectively identify trends toward an outcome of interest. In developmental psychopathology research, the term has been applied in reference to aspects of early adjustment that may portend problematic psychosocial outcomes. For example, as part of their classic review of the link between peer rejection and maladjustment, Parker and Asher (1987) suggested that rebuff by peers could emerge as a lead indicator of later pathology by serving as a marker of underlying vulnerabilities. Predictive models that seek to investigate constructs of this nature are critical from a public health perspective. A focus on lead indicators does not reveal etiological mechanisms or directional relations but can facilitate identification of youths who are likely to encounter functioning difficulties in later stages of development.

Indicator variables that allow detection of outcomes over broad spans of development and through periods of significant social reorganizations (e.g., the transition from childhood to adolescence) will have particular utility for prediction. With regard to peer victimization as a potential marker of later vulnerability to internalizing problems, the inferences that we can currently draw are constrained by the limited availability of relevant prospective findings. To date, much of the existing research examining relations between peer victimization and internalizing problems has relied on cross-sectional (for a review, see Hawker & Boulton, 2000) or short-term longitudinal designs (e.g., designs in which samples have been followed for 2 to 3 years: Boivin et al., 1995; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Schwartz et al., 2005). Only a handful of studies have been conducted in which participants have been followed for periods of 6 or more years. Complicating the picture further, many of these projects have focused only on boys.

Olweus's (1993) follow-up investigation with 87 young adult men (age 23) provided some of the earliest available findings regarding peer victimization and the development of internalizing problems. These young adults had emerged as "whipping boys" while they were still students in Swedish secondary schools (i.e., from Grades 6 through 9; as described by Olweus, 1978). Victimization was related to later low self-esteem and depressive tendencies, but the associations were not significant once earlier levels of adjustment were considered.

More recently, Isaacs, Hodges, and Salmivalli (2008) followed 177 Finnish adolescents (ages 13–14) into early adulthood (ages 22–23). Peer victimization predicted increases in depression and decreases in self-esteem. Of interest, these links held only for those participants who also reported low levels of support from parents. Isaacs et al.'s important findings highlight the complexity of the pathway from peer victimization to later maladjustment.

Relevant analyses were also conducted as part of the Finnish "from a Boy to a Man" epidemiological study (Klomek et al., 2008; Sourander et al., 2007). A cohort of more than 2,000 Finnish boys was recruited at age 8 and followed into their early adult years (ages 18–23). Bully/victim problems were assessed with self, teacher, and parent reports. Adult outcomes were assessed via a battery of self-report inventories administered as part of military call-up. Peer victimization was predictive of anxiety, depression, and suicidal ideation during the young adult years, but not all associations remained significant once earlier adjustment was taken into account. In addition, the pattern was most pronounced for those victimized youths who were concurrently aggressive (as per Kumpulainen et al., 1998; Schwartz, 2000).

The present study examines peer victimization during middle childhood as a lead indicator of internalizing problems through late adolescence. This developmental period is of high interest because it marks an important shift in the prevalence of depression, anxiety, and related problems. Although the peak onset of most internalizing disorders does not occur until the adult years, adolescence brings a marked increase in the incidence rates of major depression, generalized anxiety disorder, and other pathologies of the emotion systems (Beesdo, Knappe, & Pine, 2009; Rudolph, 2009.). There is also a dearth of available investigations that follow victims of bullying from childhood through late adolescence/ early adulthood.

One of our central objectives was to extend existing long-term research by investigating trajectories of internalizing disorders. In bully/victim studies that have targeted adjustment outcomes over 6 or more years, the most common methodological approach is one that incorporates two waves of data. Typically, there is an initial assessment of functioning during childhood or adolescence with a follow-up at a later point in development (Isaacs et al., 2008; Olweus, 1993). Designs of this nature can illuminate the pattern of interindividual associations and provide a snapshot of relations between children's propensity to be mistreated by peers and individual differences in distress. However, as Wohlwill (1973) noted, analysis of intraindividual change is central to an understanding of development. This distinction between inter- and intraindividual differences essentially reflects relative rank (i.e., whether a child experiences a high level of internalizing problems compared to his or her peers) versus the change experienced by children over time (i.e., whether a child's absolute level of internalizing increases or decreases across development). The latter issue requires that outcomes be assessed

over multiple waves so that within-child slopes can be calculated (Singer & Willet, 2003).

A focus on within-child change would also be consistent with recent trends in research on peer victimization (Barker et al., 2008; Boivin, Peticlerc, Feng, Barker, & Delgadillo, 2010; Rudolph, Troop-Gordon, Hessel, & Schmidt, 2011). Increasingly, investigators have emphasized multiwave designs that support analysis of adjustment trajectories. Although these approaches have most often been applied in designs that target relatively constrained periods of 3 years or less, this empirical direction supports a potentially informative analytic shift. The literature on peer victimization has begun to examine multiple forms of developmental process.

A related methodological issue is that the extant research has been characterized by a nearly exclusive reliance on analogue assessments of symptoms or internalizing tendencies. Generally, anxiety, depression, and associated difficulties are assessed via self-report questionnaires or behavior problem checklists. The resulting indices are assumed to have a continuous distribution with most children having at least some level of symptoms. An alternative model, which often underlies intervention efforts, would view depression and anxiety primarily as extreme outcomes. From this framework, assessments would be optimized to capture traits, signs, and symptoms that are indicative of clinically significant levels of internalized distress. In the current study, we complemented our focus on trajectories of internalizing behavior problems by considering diagnostic outcomes determined by trained clinical evaluators.

As an exploratory goal, we also examined the role of gender. The existing findings do not provide consistent evidence that gender moderates associations between peer victimization and psychosocial functioning. Moreover, studies that have followed youths for 6 or more years have sometimes excluded girls (Olweus, 1992; Sourander et al., 2007). Nonetheless, by the middle years of adolescence, gender differences in the prevalence of internalizing disorders begin to emerge (Nolen-Hoeksema & Girgus, 1994). Marking the start of a trend that is maintained throughout much of the lifespan, girls begin to experience major depression, dysthymia, generalized anxiety disorder, and other classes of internalizing disorders at a much higher rate than boys (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998; Sterba, Prinstein, & Cox, 2007). Some theoretical perspectives also suggest that these well-documented patterns may partially reflect the greater susceptibility of girls to stress associated with interpersonal difficulties (Crick & Zahn-Waxler, 2003; Leadbeater, Blatt, & Quinlan, 1995; Nolen-Hokesema & Girgus, 1994).

To summarize, the objective of the present report is to examine evidence that victimization in the peer group during middle childhood is a lead indicator of risk for internalizing problems through the late adolescent years. Our overall goal was to enhance efforts to detect children who are likely to experience later internalizing disorders. To this end, we sought to build on existing research by considering adjustment trajectories and incorporating a focus on diagnostic outcomes. We also conducted supplemental analyses examining the moderating role of gender.

METHOD

Overview

We conducted our analyses using data collected as part of the Child Development Project (CDP; see Schwartz, Gorman, Dodge, Pettit, & Bates, 2008), a multisite prospective study that served as the basis for past reports on the predictors and outcomes associated with peer victimization (Schwartz, Dodge, Pettit, & Bates, 1997; Schwartz, Dodge, Pettit, Bates, & The Conduct Disorders Prevention Research Group, 2000; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1998, 1999). The CDP is an ongoing study that began in 1987 and has included annual assessments through childhood and adolescence.

Participant Recruitment and Retention

Two separate cohorts, recruited in consecutive years, are participating in the CDP. We recruited both cohorts from the same school districts, and they did not differ markedly in composition. There were no differences across cohorts in the concurrent correlates, predictors, or outcomes associated with peer group victimization (Schwartz et al., 1997).

We recruited the initial sample just prior to kindergarten enrollment in three geographic regions (Bloomington, IN; Knoxville, TN; Nashville, TN). Research staff approached parents and invited them to participate in a longitudinal study of child development. About 75% of the parents consented. A total of 585 children (304 boys, 281 girls) participated in the study, 308 in Cohort 1 (C1) and 277 in Cohort 2 (C2). By the time they reached middle childhood, the original participants had been dispersed into a number of different elementary schools over a wide geographic area. Resource limitations precluded data collection in all of these schools, but we obtained peer nomination data for a representative subsample (388 children; 198 boys, 190 girls) of the initial participants. This subsample has been the subject of a number of previous reports based on the CDP (Schwartz et al., 1997; Schwartz et al., 2000; Schwartz, Gorman, Dodge, et al., 2008;

Schwartz et al., 1998, 1999), and our past analyses have demonstrated similar patterns of attributes to the full sample.

Peer victimization was assessed with a peer nomination inventory that was administered in the 5th year of the project. At this point in the data collection, C1 was in the fourth grade (average of approximately 9 years) and C2 (average age of 8 years) was in the third grade. Internalizing behavior problems were assessed in 9 consecutive years for each cohort (3rd grade through 11th grade for C1, 4th grade through 12th grade for C2), and the structured clinical interview was administered in the summer following high school graduation (11 years from the peer nomination assessment for C1, and 10 years from the peer nomination assessment for C2). The sample size with peer victimization and maternal reports of internalizing behavior problem data was as follows: 329 at third/fourth grade, 276 at fourth/fifth grade, 315 at fifth/sixth grade, 315 at sixth/seventh grade, 317 at seventh/eighth grade, 300 at eighth/ninth grade, 284 at ninth/tenth grade, 296 at tenth/eleventh grade, and 300 at eleventh/twelfth grade. In addition, 286 of the participants completed the structured clinical interview.

Approximately 24% of the original subsample were from minority racial or ethnic backgrounds (almost all African American), and 26% of the children came from families classified in the two lowest socioeconomic status groups (based on criteria from Hollingshead, 1979). These children attended schools in a range of urban, suburban, and semirural contexts.

Assessment of Peer Relationships

The peer nomination inventory was group administered to all consenting children in each participant's classroom. Children were given a roster sheet and asked to identify up to three peers who fit a series of descriptors. The interview included three items that assessed peer victimization (i.e., "kids who get picked on," "kids who get teased," "kids who get hit or pushed"; $\alpha = .82$). We calculated the total number of nominations received across these items standardized within class (as per Coie, Dodge, & Coppotelli, 1982).

Current trends emphasize the assessment of both relational and overt subtypes of peer victimization (Crick & Grotpeter, 1995), whereas the items in the CDP either tap overt victimization or are not specific to either subtype. Nonetheless, in a recent paper (Schwartz, Gorman, Dodge, et al., 2008), we used the CDP data to replicate findings from an independent 2-year longitudinal study that was conducted with separate items for relational and overt victimization (i.e., Los Angeles Social Development Project; Schwartz & Gorman, 2003; Schwartz, Gorman, Duong, & Nakamoto, 2008; Schwartz et al., 2005). Analyses conducted with the CDP scale produced findings that were nearly identical to the results obtained with the combined relational and overt items in the independent project, albeit for a 2-year period during middle childhood.

Assessment of Internalizing Behavior Problems

Mothers' ratings. The participants' mothers completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). This widely used and well validated device required the mothers to indicate whether a series of behavior problem descriptors fit their child using a 3-point scale from 0 (*not true*) to 2 (*very often true*). We generated a sum from the 31 items on the Internalizing Behavior scale. Cronbach's alpha exceeded .80 in every year of the study.

Self-report. Participants completed the Youth Self-Report (YSR; Achenbach & Rescorla, 2001) for 3 consecutive years, beginning with the 6th year after the peer nomination assessment (Grades 10, 11, and 12 for C1; Grades 9, 10, and 11 for C2). The YSR internalizing scale features 31 self-report items that correspond closely to items on the CBCL. Items are also rated on a 3-point scale from 0 (*not true*) to 2 (*very often true*). We generated the sum of the internalizing items for each year. Cronbach's alpha exceeded .80 in all waves.

The YSR was developed for use with adolescent samples, and there are no norms for earlier stages of development. As a result, we were not able to include self-report data in our analysis of trajectories. Despite these limitations, we opted to report bivariate effects based on the assumption that adolescents have unique insight into their own internal states.

Assessment of Diagnostic Outcomes

The Computerized Diagnostic Interview Schedule (C-DIS-IV; Robins et al., 2000) was administered to the participants when they reached the age of 18 (10 years after the peer nomination assessment for C1, 11 years after the peer nomination assessment for C2). The C-DIS-IV is a structured interview designed to diagnose major psychiatric disorders, as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; American Psychiatric Association, 2000). A number of studies have examined the psychometric properties of the C-DIS-IV with the findings indicative of acceptable convergent validity (e.g., Fantoni-Salvador & Rogers, 1997) and good to excellent reliability (e.g., Hasin, Hatzenbuehler, Keyes, & Ogburn, 2006).

The C-DIS-IV was administered by trained interviewers who were supervised by a doctoral-level clinical psychologist. The psychologist had previously received

intensive training in administration of the C-DIS-IV. Interviewers recorded responses in a computer program designed to handle complicated skip patterns that were invoked depending on participants' responses to each question. Follow-up questions about specific aspects of a disorder were skipped if the participant did not meet the diagnostic criteria for having the disorder. The interviews were conducted in person for most participants (typically during a home visit) or via phone for participants who had moved out of the area.

We administered the full C-DIS-IV, so that a complete spectrum of diagnoses was available for consideration. Of note for the current investigation, the C-DIS-IV allows for diagnostic decisions regarding a number of different classes of pathology related to internalized distress. For our analyses, we generated dichotomous unipolar depression and anxiety scores. A participant received a positive score for unipolar depression if they met criteria for major depression and/or dysthymia. Likewise, participants received a positive score for anxiety if they met criteria for generalized anxiety disorder, specific phobia, social phobia, obsessive compulsive disorder, panic disorder, or posttraumatic stress disorder. Overall, 14.69% of the participants were positive for depression (10.00% of boys, 19.18% of girls) and 12.24% of the participants were positive for anxiety (6.43% of boys, 17.81% of girls). Comorbidity was high, with 9.8% of the participants meeting criteria for both disorders.

Past investigators have reported mixed findings regarding overlap between assessments obtained from structured clinical interviews and behavior problem checklists (Achenbach, Howell, & McConaughy, 1998; Costello, Edelbrock, & Costello, 1985). Generally, associations between behavior problem scores (obtained via adult informants or self-reports) and diagnostic outcomes from structured interviews with children or adolescents are low to moderate. Accordingly, it was our expectation that scores from the CBCL/YSR and the C-DIS-IV would provide somewhat different perspectives on adjustment.

RESULTS

Overview

Our primary empirical goal focused on examining peer victimization as a lead indicator of internalizing problems. To address this research objective, we began by considering bivariate correlations between peer group victimization in middle childhood and internalizing behavior problem scores across years of the project. We then conducted a series of multilevel models (Singer, 2002) that examined associations between peer victimization in middle childhood and changes in internalizing

from middle childhood to late adolescence. These models included peer victimization and gender as between-subjects factors and predicted the linear within-subject slope of internalizing problems (as assessed via mothers' ratings on the CBCL). We included the main effects of gender, time, and peer victimization as well as interactions between these predictors.

We also expected that peer victimization would be predictive of diagnostic outcomes, as assessed with the C-DIS-IV. To consider this hypothesis, we conducted a series of logistic regressions. In these models, each of the diagnostic outcomes at age 18 (i.e., anxiety disorders or unipolar depressive disorders) was predicted from gender and Grade 3/4 peer victimization.

Univariate and Bivariate Analyses

Before moving to our inferential analyses, we examined distributions and bivariate relations. Table 1 presents univariate statistics for all continuous variables. We also generated a series of t tests to examine attrition effects in the mother-rated and self-report internalizing scores at each wave. Differences between attrited and retained participants did not approach statistical significance in any year of the project.

Table 2 summarizes bivariate correlations between peer victimization and the internalizing scores. As depicted, Grade 3/4 peer victimization was correlated with mother rated internalizing disorders in several years of the project. It is noteworthy that the results based on the self-report scores derived from the YSR

TABLE 1
Descriptive Statistics for All Variables

Variable	Full Sample M (SD)	Gender M (SD)	
		Boys	Girls
Grade 3/4 Peer Victimization	−0.01 (.98)	0.07 (1.01)	−0.09 (0.94)
CBCL Scores			
Grade 3/4 Internalizing	6.61 (5.88)	6.12 (5.63)	7.17 (6.15)
Grade 4/5 Internalizing	6.65 (6.57)	6.09 (6.63)	7.25 (6.48)
Grade 5/6 Internalizing	6.48 (5.98)	6.80 (6.61)	6.18 (5.28)
Grade 6/7 Internalizing	7.01 (6.60)	6.41 (6.60)	7.59 (6.57)
Grade 7/8 Internalizing	7.32 (6.47)	7.03 (6.54)	7.61 (6.39)
Grade 8/9 Internalizing	7.00 (6.57)	6.63 (6.53)	7.34 (6.60)
Grade 9/10 Internalizing	5.78 (5.94)	5.43 (6.18)	6.09 (5.72)
Grade 10/11 Internalizing	6.46 (6.33)	5.37 (5.57)	7.51 (6.83)*
Grade 11/12 Internalizing	5.94 (5.62)	5.36 (5.23)	6.51 (5.94)
YSR Scores			
Grade 9/10 Internalizing	5.95 (5.11)	4.59 (4.17)	7.23 (5.56)**
Grade 10/11 Internalizing	5.71 (4.76)	4.77 (4.30)	6.63 (5.01)**
Grade 11/12 Internalizing	5.29 (4.89)	4.38 (4.58)	6.17 (5.02)**

Note: Gender comparisons were conducted with a series of paired t tests. CBCL = Child Behavior Checklist; YSR = Youth Self-Report.
*$p < .01$. **$p < .005$.

TABLE 2
Summary of Bivariate Correlations

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. 3/4 Victim	.11*	0.10	0.06	.18**	.16**	.24**	.23**	.20**	.20**	.13*	0.08	0.08	.13*	0.01
CBCL Internalizing Scores														
2. 3/4	—	.68**	.65**	.62**	.65**	.48**	.45**	.46**	.42**	.24**	.21**	.20**	0.07	0.00
3. 4/5	—	—	.65**	.71**	.69**	.49**	.40**	.46**	.34**	.24**	.22**	.13**	0.08	0.02
4. 5/6	—	—	—	.64**	.67**	.58**	.49**	.50**	.42**	.25**	.17**	.19**	0.04	0.02
5. 6/7	—	—	—	—	.66**	.56**	.49**	.56**	.47**	.26**	.23**	.22**	0.11	0.10
6. 7/8	—	—	—	—	—	.69**	.59**	.62**	.52**	.39**	.30**	.26**	0.05	.15*
7. 8/9	—	—	—	—	—	—	.71**	.60**	.57**	.33**	.35**	.26**	0.10	0.08
8. 9/10	—	—	—	—	—	—	—	.56**	.54**	.37**	.38**	.23**	.15*	0.12
9. 10/11	—	—	—	—	—	—	—	—	.66**	.40**	.37**	.29**	.14*	0.12
10. 11/12	—	—	—	—	—	—	—	—	—	.33**	.37**	.29**	.28**	.23**
YSR Internalizing Scores														
11. 9/10	—	—	—	—	—	—	—	—	—	—	.72**	.62**	.25**	.25**
12. 10/11	—	—	—	—	—	—	—	—	—	—	—	.65**	.30**	.19**
13. 11/12	—	—	—	—	—	—	—	—	—	—	—	—	.32**	.33**
C-DIS-IV Diagnoses at Age 18														
14. Unipolar Depression	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15. Anxiety	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note: CBCL = Child Behavior Checklist; YSR = Youth Self-Report; C-DIS-IV = Computerized Diagnostic Interview Schedule.
*$p < .05$. **$p < .005$.

were generally less consistent than the corresponding findings for the CBCL data.

For purposes of these analyses, the diagnostic outcomes assessed with the C-DIS-IV at age 18 were operationalized as dichotomous variables (0 = *does not meet criteria for disorder*, 1 = *meets criteria for disorder*). We did not find a strong pattern of associations between these scores and the internalizing behavior problems scores, although there were some effects that were of moderate magnitude. Overall, the results seem to support our view of each index as capturing a partially distinct aspect of child dysfunction.

To determine whether the pattern of bivariate correlations differs as a function of gender, we specified a series of regression models. Internalizing problems at each wave were predicted from the main effect of Grade 3/4 peer victimization, the main effect of gender, and the two-way Victimization × Gender interaction. These models did not yield any significant interactions.

Associations Between Peer Victimization, Gender and the Slope of Mothers' Reports of Internalizing Problems

Following the univariate and bivariate analyses, we specified multilevel models to examine relations between peer victimization and the slope of mother-rated internalizing problems. Guided by Singer and Willett (2003), we implemented our analyses using PROC MIXED in the SAS statistical package (Littell, Milliken, Stroup, & Wolfinger, 1996). PROC MIXED uses pairwise deletion, and the underlying correlation matrices are

estimated based on all available data. Accordingly, observations are retained in the analysis even if there are missing values at specific time points. To be conservative, we applied square-root transformations to the scores prior to analysis (as recommended by Tabachnick & Fidell, 2007).

PROC MIXED does not yield statistics that allow for an absolute test of model significance. Accordingly, Singer and Willett (2003) suggested a series of comparisons between progressively more complex models. Improvements in fit to the underlying covariance matrix are then assessed. With this strategy, a relatively large number of models are specified but comparisons are between iterations of the same underlying model. Accordingly, experiment error rates are maintained.

The initial comparisons are made with an unconditional means model and an unconditional growth model. The unconditional means model does not include any predictor variables, essentially implying that the outcome construct does not change over time. In the unconditional growth model, time is the only predictor variable so that change in the outcome construct that is not accounted for by substantive predictors is implied.

Table 3 summarizes unconditional means and unconditional growth models predicting the within-child slope of internalizing. As shown, the unconditional growth model offered a significant improvement in fit beyond the unconditional means model. This pattern indicates that mother-rated internalizing problems change over time.

We then specified a multilevel model that included Grade 3/4 peer victimization (Model 1) as a predictor. As shown in Table 3, this model significantly improved

TABLE 3
Summary of Multilevel Models Predicting Changes in Internalizing from Grade 3/4 Peer Victimization and Gender

	Model					
	Unconditional Means	Unconditional Growth	Model 1	Model 2	Model 3	Model 4
Fixed Effects						
Main Effects						
Time	—	−.0170 (.0074)*	−.2248 (.0944)*	−.0223 (.0104)*	−.2412 (.0953)*	−.3357 (.1313)*
Victimization	—	—	.5442 (.2822)	—	.8323 (.3520)*	.6742 (.3829)
Gender	—	—	—	.1322 (.1073)	1.4991 (1.133)	.6647 (1.3857)
Interactions						
Victim × Gender	—	—	—	—	−.5529 (.4631)	−.2102 (.5673)
Victim × Time	—	—	.0855 (.0386)*	—	.0894 (.0387)*	.1280 (.0534)*
Gender × Time	—	—	—	.0103 (.0147)	.0131 (.0146)	.2100 (.1889)
Victim × Gender × Time	—	—	—	—	—	−.0809 (.0774)
Variance Components						
Level 1						
Within-Person	.6496 (.0534)**	.8616 (.0778)**	.8514 (.0770)**	.8574 (.0774)**	.8464 (.0767)**	.8458 (.0768)**
Level 2						
In Initial Status	—	−.0464 (.0085)**	−.0482 (.0085)**	−.0466 (.0085)**	−.0489 (.0085)**	−.0487 (.0085)**
In Rate of Change	—	.0108 (.0014)**	.0105 (.0014)**	.0107 (.0014)**	.0104 (.0014))**	.0104 (.0014)**
Goodness of Fit						
Deviance	6547.0	6390.8	6371.5	6386.5	6363.6	6362.5
AIC	6553.0	6402.8	6387.5	6402.5	6385.6	6386.5
BIC	6564.9	6426.6	6419.1	6434.2	6429.2	6434.0
Model Comparison						
Δ Unconditional Means	—	156.2**	175.5**	160.5**	183.5**	184.5**
Δ Unconditional Growth	—	—	19.3**	4.3	27.2**	28.3**
Δ Model 1	—	—	—	—	7.9*	9.0
Δ Model 2	—	—	—	—	22.9**	24.0**
Δ Model 3	—	—	—	—	—	1.1

Note: Effects are presented as unstandardized parameters, with standard error in parentheses.
*$p < .05$. **$p < .005$.

the fit beyond the unconditional means and unconditional growth models. There was also a significant positive fixed effect for peer victimization by time, indicating that the slope of internalizing increased with higher levels of Grade 3/4 peer victimization.

Next, we specified a model with gender (Model 2) as a predictor of within-subject changes in internalizing. This model did not significantly improve the fit beyond the unconditional growth model. We also did not find a significant Gender × Time effect. Thus, there was no evidence for gender differences in the within-child slope of internalizing.

We followed with an analysis (Model 3) that included gender, Grade 3/4 peer victimization, and the Peer Victimization × Gender interactions as simultaneous predictors of changes in internalizing. This model significantly improved the fit beyond the less complex models. There was a significant fixed effect for peer victimization by time whereas the corresponding fixed effect for gender by time did not approach significance. The relation between peer victimization and increases in internalizing was significant, independent of the effects of gender.

The last iteration in the sequence (Model 4) included all possible two-way interactions as well as the three-way peer victimization by gender by time interaction. This model did not significantly improve the fit beyond Model 3 and, thus, is not interpretable. The model also failed to produce a significant Peer Victimization × Gender × Time interaction, indicating that the predictive relation between peer victimization and internalizing did not differ by gender.

Peer Victimization as Predictor of Unipolar Depression and Anxiety as Assessed via Structured Clinical Interview

In our final series of analyses, we conducted a series of hierarchical logistic regressions to examine relations between Grade 3/4 peer victimization and the dichotomous unipolar depression and anxiety diagnoses derived from the C-DIS-IV at age 18. On the first step of these models, each of the diagnostic outcomes was predicted from gender and Grade 3/4 peer victimization. On the second step, we entered the Peer Victimization × Gender interaction.

TABLE 4
Logistic Regressions Predicting Diagnostic Outcomes at Age 18
From Peer Victimization in Grade 3/4

Predictor	Depression OR [95% CI]	Anxiety OR [95% CI]
Step 1		
Peer Victimization	1.41 [1.06, 1.86]*	0.95 [0.67, 1.34]
Gender	2.35 [1.16, 4.74]*	0.31 [0.14, 0.70]*
Model $\chi^2(2)$	10.10**	9.06**
Step 2		
Victimization × Gender	0.36 [0.31, 1.32]	−0.26 [0.42, 0.38]
Model $\chi^2(3)$	11.50**	9.50**

Note: OR = odds ratio; CI = confidence interval.
*$p < .05$. **$p < .01$.

As shown in Table 4, there were significant gender effects for both anxiety and unipolar depression, with girls more likely than boys to experience each outcome. There was also a significant relation between Grade 3/4 peer victimization and unipolar depression, indicating that peer victimization had a small association with later unipolar depression. Peer victimization was not, however, predictive of anxiety outcomes. Moreover, we did not find any significant Peer Victimization × Gender interaction effects in either of the models. Thus, our analyses did not produce any evidence that the relation between peer victimization and diagnostic outcomes differs as a function of gender.

DISCUSSION

Past researchers have reported concurrent and short-term relations between peer victimization and internalized distress (Hawker & Boulton, 2000). Nonetheless, given the limited availability of research that examines periods greater than 2 to 3 years, questions have remained regarding the persistence of these links. In the current study, we sought to build on existing findings by examining associations between peer group victimization in middle childhood and internalizing behavior problems and diagnostic outcomes in late adolescence. Taken together, the results of our analyses provide evidence that peer victimization during middle childhood can serve as a marker of disorder at later stages of development.

We found a moderate pattern of correlations between peer victimization in third/fourth grade and internalizing behavior problems (as assessed by maternal ratings) over a 9-year period. These links held over multiple waves of data collection with bivariate associations in consecutive years during mid- to late adolescence. Our models also revealed a positive relation between peer victimization and the within-child slope of internalizing from middle childhood through the late adolescent years.

The information provided by each specific source of data is important to recognize as we consider these results. Because adolescents have immediate access to their own emotional states and cognitive styles, self-reports can provide unique insight into the occurrence of internalized distress. On the other hand, parental reports tend to be a more accurate predictor of clinical outcomes than scores derived from self-report inventories (Achenbach & Rescorla, 2001). For some youths, observable manifestations of particular internalizing disorders may be indicative of especially severe forms of dysfunction.

Surprisingly, associations between peer group victimization during middle childhood and self-reported internalizing problems (obtained for 3 consecutive years during late adolescence) were largely nonsignificant in the CDP data. Conversely, victimization during middle childhood was correlated with mother-rated internalizing problems across most years of the project. This somewhat counterintuitive outcome highlights the need to incorporate multi-informant assessments in bully/victim research and to attend carefully to biases associated with each data source. Efforts to identify indicators of later maladjustment may be dependent on the specific features of the outcome assessment. Disagreement between data sources may occur partially because each informant has a unique perspective on a child's psychosocial functioning. Peer victimization could be most closely linked to the processes that a specific data source taps.

Our conceptualization of change over time focused on intraindividual trajectories. That is, we investigated relations between peer victimization and fluctuations in the absolute level of internalizing problems experienced by youths over time. Until recently, research in this domain emphasized interindividual differences as manifested in relative rank within the sample (i.e., examining whether a child who experiences victimization at a high rate relative to his or her peers also has high scores on internalizing indices relative to peers). To evaluate risk more accurately, we will need to consider multiple levels of developmental process (Wolhill, 1973).

Assessment of interindividual change is a complex task because multiwave assessments are required (Singer & Willet, 2003). Bully/victim investigators have begun to emphasize such designs over 2- to 3-year periods. In research conducted over longer spans of time, cross-panel methodologies are more common with an initial assessment and a single follow-up. We view our focus on long-term trajectories of internalizing as a central contribution of this project. Our findings regarding within-child change in dysfunction are an important complement to research on individual differences.

We also found that peer victimization was associated with unipolar depression as assessed via a structured

clinical interview. Children who experienced frequent victimization in the elementary school years had a modest (but significant) likelihood of meeting criteria for a unipolar depressive disorder during the late adolescent years. It seems particularly noteworthy that these relations occurred across a broad span of development (10 years for C1, and 11 years for C2), emphasizing the potential importance of peer victimization as a long-term risk indicator.

In the extant bully/victim literature, assessment of internalized distress has relied primarily on questionnaires collected from community samples (Hawker & Boulton, 2000). If we view internalizing disorders as continuous distributions of symptoms (Hankin, Fraley, Lahey, & Waldman, 2005), the resulting indices may be thought of as points on a continuum that includes more extreme outcomes (K. Hodges, 1994). Such perspectives are not without controversy (Solomon, Ruscio, Seeley, & Lewinsohn, 2006). Psychopathology researchers have often taken a cautious stance to self-reports and behavior problem checklists, conceptualizing the relevant devices as analogue assessments of symptoms rather than indicators of clinically significant outcomes (Klein, Dougherty, & Olino, 2005). Assessments obtained via structured interviews or clinicians' reports can help to complete the picture. Diagnoses based on structured interviews draw on information that is obtained directly from an adolescent but is evaluated by a trained administrator, interpreted with established diagnostic criteria, and scored with clinical norms.

The suggestion that structured interviews and behavior problem checklists tap partially distinct forms of information is highlighted by some aspects of our findings. We did not find a compelling pattern of associations between internalizing behavior problems and clinical judgments regarding depression and anxiety. In this regard, our findings were consistent with some findings reported by past investigators (Achenbach et al., 1998). Research on links between peer victimization and later diagnostic outcomes could potentially benefit from a move beyond questionnaire scores and behavior problem checklists.

Another interesting aspect of our findings was that peer victimization was associated with unipolar depressive disorders but not anxiety disorders. Nonsignificant findings certainly do not support conclusions, but these results might offer some clues as to specific pathways that are indicated by earlier experience with victimization in the peer group. Depression and anxiety are both processes that are rooted in high levels of negative affect, but each category of disorder is also characterized by unique features (Watson, 2005). Although we suspect that peer victimization will ultimately emerge as a broad indicator that is characterized by multifinality (Cicchetti & Rogosch, 1996), more specific pathways are also possible.

Our analyses included multiple waves of internalizing data but peer group victimization was assessed at only a single point in time. Due to this serious design limitation, we were unable to consider the chronicity of bully/victim experiences. Individual differences in children's propensity to experience victimization by peers tend be fairly stable by the elementary school years (e.g., Hanish & Guerra, 2002; E. V. E. Hodges & Perry, 1999; Schwartz et al., 2005), and those children who emerge as persistent victims are particularly likely to experience later maladjustment (Kochenderfer-Ladd & Wardrop, 2001). Nevertheless, some children do experience these difficulties on a more transient basis, and analysis of different trajectories could prove informative as we seek to develop accurate predictive models.

In the absence of multiple waves of peer victimization, we are also unable to consider potential reciprocal relations between internalizing and peer victimization. Although we have conceptualized peer victimization as a risk indicator and do not attempt to make causal arguments, our models incorporate the implicit assumption that internalizing is an outcome construct rather than a predictor. The reverse pattern may also be viable, with internalized distress leading to emergence of peer group difficulties (Kochel, Ladd, & Rudolph, 2012; Snyder et al., 2003). Researchers have also demonstrated that dispositions characterized by submissive or timid behavior (Schwartz et al., 1993) and low self-esteem (Egan & Perry, 1998) increase a child's vulnerability to victimization by peers. As evidence begins to accumulate, we suspect that reciprocal models will receive convincing empirical support. For now, we are limited to the conclusion that peer victimization is linked to internalized distress over relatively long periods. Moreover, there does appear to be evidence in our data that risk is rooted in processes that are beyond the stability of dysfunction.

Regardless of the specific causal processes, our findings could have public health implications. Our analyses suggest that peer victimization is an efficient lead indicator of a problematic trajectory. Despite the considerable psychological and social reorganizations that take place during the transition from childhood to adolescence, victimization by peers during the elementary school years appears to identify youths who are relatively likely to encounter internalized distress during the late adolescent years.

Working from this epidemiological perspective, it will also be important to recognize that victimized youths are likely to be characterized by other concomitant social problems, including aggressive behavior (E. V. E. Hodges & Perry, 1999; Ostrov, 2010), rejection (Perry, Kusel, & Perry, 1988), unpopularity (Gorman, Schwartz, Nakamoto, & Mayeux, 2011), and friendlessness. These associated difficulties with peers could also shape trajectories toward

internalizing outcomes. One implication is that the prediction associated with peer group victimization may partially reflect the influence of correlated social vulnerabilities. Thus, our conceptualization of peer victimization as a lead indicator should not be taken to imply that other aspects of early social maladjustment are unrelated or do not have a significant predictive role. Instead we contend that peer victimization can more accurately be viewed as a salient manifestation of a broader range of problems in the peer group.

A concern with social maladjustment as a larger pattern would be consistent with a cascade model of psychopathology (Masten et al., 2005). A premise underlying these models is that partially distinct forms of difficulties with peers can be reciprocally related and predictive of disorder through transactional process. We are not in a position to test such a model in the current data set. Design limitations notwithstanding, we believe that the utility of lead indicator models could be enhanced by analyses that examine independent and synergistic effects of co-occurring social experiences.

A related issue is that risk is not necessarily equivalent across all bullied youths. The majority of persistently victimized children are characterized by a passive or submissive behavioral pattern, but a small percentage of these children exhibit more aggressive or disruptive behavior patterns (Schwartz, Proctor, & Chien, 2001). Children who are concurrently aggressive and victimized are particularly likely to experience pervasive forms of maladjustment and thus remain a subgroup of great theoretical significance. Consistent with this hypothesis, there is growing evidence that aggressive victims are at elevated risk for long-term dysfunction (Klomek et al., 2008).

For the current article, we opted to retain a dimensional perspective rather than focusing on extreme categories partially to optimize statistical power. More important, our goal was to develop predictive models that are relevant for both girls and boys. We have not been able to identify a sufficient number of female aggressive victims for analysis in past publications based on the CDP (Schwartz et al., 2007). To some extent, this pattern in our data may relate to an emphasis on overt forms of victimization. When more balanced assessments are used, a larger number of girls who are concurrently victimized and aggressive can be identified (Toblin, Schwartz, Gorman, & Abou-ezzeddine, 2005).

Ambiguities also remain with regard to the role of gender. Gender disparities in the prevalence of major depression and other internalizing disorders emerge in the years following the onset of puberty, with girls experiencing higher incidence rates than boys. Several theorists have speculated that this pattern may be partially driven by girls' susceptibility to the impact of social stress (Nolen-Hoeksema & Girgus, 1994).

Accordingly, we wondered whether mistreatment by peers might prove more disruptive for girls than boys. Our analyses did not provide support for this hypothesis, but it is possible that a peer victimization assessment of distinct subtypes would produce a different pattern (Crick, Ostrov, & Kawabata, 2007).

Even though we did not find evidence that internalizing trajectories differ for boys and girls, the gender composition of the CDP sample is still quite noteworthy. Existing research on the long-term risks associated with peer group victimization has tended to include only boys. Because girls are frequently involved in bully/victim problems and have an integral role in the resulting peer group dynamics (Crick & Grotpeter, 1995), a research base that is relevant for both genders is critical.

To conclude, this study revealed associations between victimization in the peer group during the middle years of elementary school and internalizing trajectories through the final years of high school. We also found links between peer group victimization in childhood and major depression in later adolescence/early adulthood. The underlying mechanisms are not yet clear, but victimization in the peer group appears to be an efficient lead indicator of long-term risk for the development of internalizing disorders.

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