A Latent Growth Curve Analysis of Early and Increasing Peer Victimization as Predictors of Mental Health Across Elementary School

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Abstract

Peer victimization has been implicated as a traumatic stressor that compromises children's long-term mental health, yet a dearth of prospective research specifically demonstrates lasting effects of early victimization. This research examined whether early (2nd grade) victimization and increasing (2nd – 5th grade) victimization independently predicted depressive symptoms and aggressive behavior (overt and relational) in 5th grade. Participants included 433 children (238 girls, 195 boys). Children reported on peer victimization and depressive symptoms; teachers reported on peer victimization and aggressive behavior. Latent growth curve analysis revealed that both early and increasing victimization made unique contributions to subsequent depressive symptoms and aggressive behavior. Relational aggression was particularly likely to follow victimization in girls.

Over the past two decades, developmental scientists have increasingly implicated peer victimization as a major public health concern (Graham, 2006; Hawker & Boulton, 2000), sparking the emergence of a large number of prevention programs aimed at containing bullying and its negative effects. In large part, this concern stems from the idea that peer victimization exerts a lasting influence on mental health. Although some short-term prospective research links peer victimization with subsequent mental health problems, few studies systematically examine the relative contributions of early versus increasing victimization to mental health across a significant developmental period. Consequently, it is difficult to determine whether early exposure to peer victimization has long-term consequences beyond children's recent social experiences. The present study used a dual-informant longitudinal design to examine whether both early victimization and changes in victimization across the elementary school years predicted subsequent mental health difficulties, specifically depressive symptoms and aggressive behavior.

Mental Health Consequences of Peer Victimization

Children exposed to victimization at the hands of their peers may react in diverse ways. They may feel a sense of helplessness and attribute this maltreatment to their own deficiencies, potentially compromising their self-worth and precipitating depressive

symptoms (Graham & Juvonen, 1998; Troop-Gordon & Ladd, 2005). Alternatively, they may feel a sense of injustice and attribute this maltreatment to the hostility of their peers, potentially inciting anger and efforts to retaliate or to re-establish their status in the peer group through aggressive behavior (Mahady Wilton & Craig, 2000; Salmivalli, Karhunen, & Lagerspetz, 1996; Troop-Gordon & Ladd, 2005). Consistent with these ideas, prospective longitudinal research reveals that victimization contributes to subsequent depressive symptoms (Nylund, Bellmore, Nishina, & Graham, 2007; Prinstein, Boergers, & Vernberg, 2001; Sweeting, Young, West, & Der, 2006), as well as aggression (Hanish & Guerra, 2002; Lamarche et al., 2007; Ladd & Troop-Gordon, 2003; Rusby, Forrester, Biglan, & Metzler, 2005). Despite these established linkages, most longitudinal studies have been of relatively short duration and have examined whether levels of victimization at one particular time point predict subsequent mental health difficulties.

A few studies are noteworthy for their examination of longer time frames or use of multiple assessments of victimization. For example, one study found that victimization during the 1st – 3rd grades contributed to loneliness and externalizing difficulties at the end of 4th grade even after accounting for proximal (i.e., 4th grade) victimization experiences (Ladd & Troop-Gordon, 2003). In a follow-up, latent growth curve analyses revealed that both initial victimization and changes in victimization from 4th to 6th grade predicted internalizing problems, but only changes in victimization predicted externalizing problems (Troop-Gordon & Ladd, 2005). Research also suggests that growth in victimization during early elementary school (kindergarten to 1st grade) predicts growth in depressive symptoms and aggressive behavior across this same time period (Snyder et al., 2003). In a recent study, Leadbeater and Hoglund (2009) used a cross-lagged panel design to examine reciprocal associations between victimization, internalizing symptoms, and physical aggression from 1st to 3rd grade. This study revealed that victimization predicted subsequent internalizing symptoms and physical aggression in boys but not in girls. Using trajectory analyses, Goldbaum and colleagues (Goldbaum, Craig, Pepler, & Connolly, 2007) found that early adolescents with increasing ("late onset") victimization showed increasing aggression over time. Finally, Hanish and Guerra (2002) found that victimization predicted internalizing symptoms and aggression two years later even after adjusting for the stability of victimization.

Despite their strengths, even these studies often have been constrained by a primary focus on static, single informant measures of victimization, relatively short follow-up assessments, and the frequent use of global measures of mental health (e.g., internalizing and externalizing symptoms). Accordingly, it remains unclear whether victimization experienced early in development has lasting consequences for specific aspects of children's mental health beyond the influence of more proximal experiences.

Sex Differences in the Mental Health Consequences of Victimization

The present study also considered the proposition that girls and boys may react differently to victimization. Because girls are more likely than boys to make internal attributions of blame (Hankin & Abramson, 2002), girls may be more inclined to attribute peer maltreatment to their own social deficiencies, thereby fostering depressive symptoms. Also, although both girls and boys may react to victimization with a need to reassert their status in the peer group, the means through which they accomplish this goal may differ. Specifically, considerable research suggests that boys engage in more overt forms of aggression (e.g., physical, verbal) than do girls (for reviews, see Archer, 2004; Card, Stucky, Sawalani, & Little, 2008). Some research also suggests that girls engage in more relational forms of aggression (e.g., social manipulation, exclusion) than do boys (e.g., Crick & Grotpeter, 1995), although the size of this sex difference is small and variable across assessment

methods (Archer, 2004; Card et al., 2008). Thus, boys may be more likely to use overtly aggressive behavior and girls may be more likely to use relationally aggressive behavior to re-establish their social status or dominance following victimization. On the other hand, the sex-specific divergence in trajectories of both depression and aggression (i.e., girls showing sharp increases in depression and boys showing sharp increases in antisocial behavior) tends to occur during the adolescent transition (Hankin & Abramson, 2001; Lahey et al., 2006). Consequently, it is possible that victimization will predict similar mental health difficulties in girls and boys prior to adolescence.

A few studies have examined sex differences in the prospective linkage between victimization and mental health. These studies have yielded mixed findings, which likely reflect a range of methodological disparities, including differences in age, informants, type of adjustment, timing of assessments, and analytic approach. Whereas some studies suggest fairly similar patterns for girls and boys (e.g., Ladd & Troop-Gordon, 2003), others report differences (e.g., Rusby et al., 2005; Snyder et al., 2003). Some research documents more consistent or enduring effects of victimization in boys (Leaderbeater & Hoglund, 2009), particularly with regard to externalizing problems (Hanish & Guerra, 2002; Sullivan, Farrell, & Kliewer, 2006; cf. Khatri, Kupersmidt, & Patterson, 2000). One study suggested stronger effects of victimization on depressive symptoms in girls (Paul & Cillessen, 2003). Importantly, many studies exclusively examine the effect of physical or overt, rather than relational, victimization and few of these studies examine the contribution of victimization to relational aggression (for an exception, see Sullivan et al., 2006), perhaps accounting for weaker effects in girls than in boys.

Reciprocal Effects of Depressive Symptoms and Aggressive Behavior on Victimization

Consistent with transactional perspectives on development (Sameroff & MacKenzie, 2003), depressive symptoms and aggressive behavior also may contribute to subsequent victimization. Depressive symptoms (e.g., irritability, lack of motivation and enjoyment, withdrawal) elicit aversive interpersonal reactions, interfere with children's ability to develop strong friendships, and undermine effective responses to peer problems (Little & Garber, 1995; Nolen-Hoeksema, Girgus, & Seligman, 1992; Prinstein, Borelli, Cheah, Simon, & Aikins, 2005), thereby marking children as easy targets of victimization (Goldbaum et al., 2007; Leadbeater & Hoglund, 2009). Likewise, peers may react to aggressive children with either physical attacks or social exclusion (Leadbeater & Hoglund, 2009). Thus, it is possible that aggression serves to suppress negative feedback such as victimization by peers due to concerns about retaliation (Snyder et al., 2003; Zakriski & Coie, 1996).

Some research suggests that internalizing symptoms, including depression (Snyder et al., 2003; Sweeting et al., 2006), and aggressive behavior (Kochenderfer-Ladd, 2003; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999) predict subsequent victimization, although these effects are moderated by a variety of factors such as sex, age, socioeconomic status, peer rejection, and number, quality, and characteristics of friendships (Hodges, Malone, & Perry, 1997; Leadbeater & Hoglund, 2009; Schwartz et al., 1999; Snyder et al., 2003; Sweeting et al., 2006). Moreover, some research fails to support a reciprocal effect of mental health on victimization (McLaughlin, Hatzenbuehler, & Hilt, 2009), reveals opposite effects (e.g., aggressive behavior predicting less victimization over time; Snyder et al., 2003), or suggests inconsistent associations across time (Leadbeater & Hoglund, 2009; Sweeting et al., 2006).

Current Study

To address gaps in prior research examining the long-term mental health consequences of victimization, the present study examined the contribution of both static (2nd grade) and dynamic (trajectories across 2nd – 5th grade) indicators of victimization to mental health (depressive symptoms and aggressive behavior) at the end of elementary school (5th grade), adjusting for initial (2nd grade) levels of adjustment. Understanding predictors of children's mental health at this developmental stage is critical because youth whose personal or contextual resources are compromised by adjustment difficulties may have trouble navigating the challenging transition to middle school (for reviews, see Roeser & Eccles, 2000; Rudolph, 2004). Comprehensive, dual-informant reports of victimization (i.e., child and teacher reports of overt and relational victimization) enabled us to assess a wide range of victimization experiences and to avoid biases associated with shared method variance. To provide an evaluation of specific mental health consequences, we included distinct measures of depressive symptoms, overt aggression, and relational aggression. Moreover, contrary to most of the prior research (for an exception, see Leadbeater & Hoglund, 2009), we adjusted for co-occurrence among different mental health difficulties. Finally, we systematically examined sex differences in the contribution of victimization to subsequent mental health. We anticipated that early (2nd grade) and increasing (2nd – 5th grade) victimization would make independent contributions to mental health in 5th grade, after adjusting for children's initial mental health in 2nd grade. Further, we thought it possible that victimization would contribute more strongly to subsequent depressive symptoms and relational aggression in girls and to subsequent overt aggression in boys.

Method

Participants

Participants were 433 children (238 girls; 195 boys; 72.5% White, 27.5 % minority; 36.7% received a subsidized school lunch) participating in a longitudinal study of peer victimization. In 2nd grade (Wave 1; W_1), written informed consent forms were distributed to parents, and children provided oral assent. Of 494 eligible children, 373 (76%) received consent to participate. Participants and nonparticipants did not significantly differ in sex, $\chi^2(1) = .25$, *ns*, age, $t(492) = .13$, *ns*, ethnicity (white vs. minority), $\chi^2(1) = .01$, *ns*, or school lunch status (full pay vs. subsidized), $\chi^2(1) = .16$, *ns*.

In the 3rd grade, an additional 60 children who were in the classes of the participating children were recruited to comprise the total sample of 433 children. Follow-up assessments were conducted at annual intervals through the 5th grade (Wave 4; W_4). Of the original 433 participants, 386 (89%) continued to participate through the 4th wave of the study. Children who completed the 4th wave did not significantly differ from those who dropped out in terms of sex, $\chi^2(1) = .32$, *ns*, ethnicity (white vs. minority), $\chi^2(1) = 2.00$, *ns*, or school lunch status (full pay vs. subsidized), $\chi^2(1) = .13$, *ns*. Children who dropped out of the study were significantly older than those who completed the 4th wave, $t(431) = −2.74$, $p < .01$. For children recruited in 2nd grade, those who remained in the study versus dropped out did not significantly differ in W_1 victimization, $t(371) = .41$, *ns*, depressive symptoms, $t(371) = −1.32$, *ns*, overt aggression, $t(371) = −.60$, *ns*, or relational aggression, $t(368) = 1.68$, *ns*. For children recruited in 3rd grade, those who remained in the study versus dropped out did not significantly differ in W_2 victimization, $t(58) = −1.15$, *ns*, depressive symptoms, $t(58) = −.64$, *ns*, overt aggression, $t(58) = −0.07$, *ns*, or relational aggression, $t(58) = −1.28$, *ns*. All of the participating 433 children were included in the central analyses.

Procedures

All of the procedures for this study were approved by the university's Institutional Review Board. For the first three waves, research assistants read questionnaires to small (i.e., 2 – 4) groups of children, who circled their responses. For the fourth wave, questionnaires were group administered in the classroom; additional research assistants provided help as needed. Teachers returned their surveys to a locked box at their school. For their participation, children received a small gift; teachers received a monetary reimbursement.

Measures

Peer victimization—Children and teachers completed a revised version of the Social Experiences Questionnaire (Crick & Grotpeter, 1996) to assess children's exposure to peer victimization. This measure assesses overt victimization (being the target of behaviors intended to harm others through physical damage or the threat of such damage; e.g., "How often do you get hit by another kid?") and relational victimization (being the target of behaviors intended to harm others through manipulation of peer relationships; e.g., "How often does another kid say they won't like you unless you do what they want you to do?"). Eleven items were added to the original measure to provide a more comprehensive assessment of victimization, resulting in a 22-item measure. Of the new items, six assessed overt victimization (e.g., "How often do you get teased by another kid?") and five assessed relational victimization (e.g., "How often does a friend spread rumors about you because they are mad at you?"). Children checked a box and teachers provided a rating indicating how often children experienced each type of victimization on a five-point scale. Scores were computed as the mean of the items.

Research suggests that self-reports of victimization provide valid information that corresponds to reports by peers (e.g., Graham & Juvonen, 1998), reports by parents (Bollmer, Harris, & Milich, 2006) and with behavioral observations as early as kindergarten (e.g., Kochenderfer & Ladd, 1997). Teacher reports of victimization also have established reliability and validity, and self- and teacher reports of victimization are significantly correlated (Ladd & Kochenderfer-Ladd, 2002). In the present sample, child and teacher reports were moderately but significantly correlated at all waves (average $r = .25$, $ps < .001$). Thus, composite victimization scores were created by averaging the child and teacher reports. Composite scores increase reliability and reduce the impact of measurement error (Ladd & Kochenderfer-Ladd, 2002; Rushton, Brainerd, & Pressley, 1983; Schwarz, Barton-Henry, & Pruzinsky, 1985). Moreover, this composite score provided a more comprehensive picture of victimization by incorporating both child and teacher perspectives, which may provide both overlapping and distinct information about victimization experiences. Indeed, research shows that self and teacher reports of victimization are uniquely associated with children's adjustment, and a multi-informant composite of victimization is a better predictor of adjustment than mono-informant assessments (Ladd & Kochenderfer-Ladd, 2002). Using a composite score of child and teacher reported victimization also enabled us to avoid single-informant measurement bias (i.e., child reports of victimization and depressive symptoms; teacher reports of victimization and aggressive behavior).

Depressive symptoms—Children completed the Short Mood and Feelings Questionnaire (Angold et al., 1995). This 13-item measure assesses children's recent depressive symptoms (e.g., "I felt unhappy or miserable."). The response format was modified from a three- to four-point scale to provide a format similar to other study questionnaires. Scores were computed as the mean of the items. This measure shows moderately high correlations with scores on the Children's Depression Inventory and the Diagnostic Interview Schedule for Children (Angold et al., 1995), and differentiates depression from other psychiatric diagnoses (Thapar & McGuffin, 1998).

Aggressive behavior—Teachers completed the Children's Social Behavior Scale (Crick, 1996) to assess children's aggression. This measure assesses overt aggression (i.e., behaviors intended to harm others through physical damage or the threat of such damage) and relational aggression (i.e., behaviors intended to harm others through manipulation of peer relationships). Teachers rated each item on a five-point scale. Scores were computed as the mean of the overt aggression (four items; e.g., "This child hits or kicks peers.") and relational aggression (five items; e.g., "This child spreads rumors or gossips about some peers.") items. Research supports the factor structure and validity of teacher reports of overt and relational aggression. Specifically, teacher reports of aggressive behavior are significantly associated with peer nominations of aggression, and predict subsequent social adjustment (Crick, 1996)

Results

Descriptive and Correlational Data

Table 1 presents descriptive data and reliability of the measures for girls and boys. All of the measures showed high internal consistency across waves. A series of *t*-tests was conducted to examine sex differences in the variables. These analyses revealed that boys showed higher levels of overt aggression in 2nd and 5th grade than did girls, whereas girls showed higher levels of relational aggression in 2nd and 5th grade than did boys. There were no significant sex differences in depressive symptoms or peer victimization (see Table 1).

Table 2 presents intercorrelations among the variables across waves. As anticipated, victimization was significantly positively correlated with depressive symptoms and aggressive behavior within and across waves, with a few exceptions for boys. Correlations among depressive symptoms and aggressive behavior were low to moderate in girls; although overt and relational aggression were significantly correlated in boys, neither was significantly correlated with depressive symptoms.

Latent Growth Curve Analysis

A latent growth curve analysis was employed using Mplus statistical software (Muthén & Muthén, 1998-2007) to examine the unique contributions of early (2nd grade) peer victimization and linear change (2nd – 5th grade) in peer victimization to 5th grade depressive symptoms and aggressive behavior, adjusting for 2nd grade depressive symptoms and aggressive behavior. This analysis was conducted using full information maximum likelihood estimation (FIML; Enders & Bandalos, 2001). Thus, parameters were estimated using all available data from the 433 participating children including those children for whom there were some missing data.

Two latent variables were created (see Figure 1). A latent intercept variable representing initial victimization was estimated by setting indicator paths from the observed 2nd – 5th grade victimization variables to be equal to 1. A latent slope variable representing linear change in victimization was estimated by setting indicator paths from the observed 2nd – 5th grade victimization variables to be equal to 0, 1, 2, and 3, respectively. By setting the path from 2nd grade victimization to the latent slope variable at 0, the intercept could be interpreted as children's exposure to victimization at the onset of the study (Duncan, Duncan, Strycker, Li, & Alpert, 1999). Observed variables representing 5th grade depressive symptoms, overt aggression, and relational aggression were included in the model. Each of these variables was predicted from the latent intercept and slope factors, adjusting for 2nd grade assessments. To test for reciprocal associations, indicators of 2nd grade depressive symptoms and aggressive behavior were allowed to covary with the latent victimization intercept and slope.

To examine potential sex differences in the latent growth trajectories or in the prediction of 5th grade depressive symptoms and aggressive behavior, multi-group structural equation modeling was employed. All paths and variances were estimated separately for girls and boys. Significant sex differences were identified by sequentially constraining each parameter to be equal across sex. Chi-square difference tests were used to determine whether there was a significant decrease in model fit when the parameter in question was constrained to be equal for girls and boys. Tests for sex differences were conducted for means of the latent intercept and slope factors, paths from the latent intercept and slope factors to 5th grade adjustment, stability paths from 2nd grade to 5th grade adjustment, and all covariances between variables.

The model fit the data well, $\chi^2(44, N = 433) = 61.40$, $p < .05$, comparative fit index (CFI) = .98; root mean square error of approximation (RMSEA) = .043, standardized root mean square residual (SRMR) = .053. Only one adjustment to the hypothesized model was made based on the modification indices: The covariance between the 3rd and 4th grade victimization indicators was freed. The mean growth trajectory for victimization was negative (−.06 and −.09, for girls and boys, respectively, $ps < .001$), indicating a decrease in victimization from 2nd to 5th grade. The difference in the magnitude of the slope for girls and boys was not statistically significant, $\chi^2(1) = 1.81$, ns. There was significant variance in the latent intercept and slope variables, indicating that there was variability across children in early victimization exposure and in trajectories of victimization over time.

For both girls and boys, the 2nd grade indicators of depressive symptoms and aggressive behavior (overt and relational) were significantly, positively associated with the latent victimization intercept variable (.53 and .59, for depressive symptoms; .32 and .69 for overt aggression; .51 and .54 for relational aggression, for girls and boys, respectively, $ps < .001$). Only the association between 2nd grade overt aggression and the victimization intercept was significantly different for girls and boys, $\chi^2(1) = 13.09$, $p < .001$. For boys, 2nd grade depressive symptoms and aggressive behavior were significantly, negatively associated with the latent victimization slope variable (−.36, −.43, and −.48, $ps < .01$, for depressive symptoms, overt aggression, and relational aggression, respectively). These covariances were not significant for girls (−.14, −.05, and −.14, ns, for depressive symptoms, overt aggression, and relational aggression, respectively). Furthermore, 2nd grade overt aggression, $\chi^2(1) = 8.30$, $p < .01$, and relational aggression, $\chi^2(1) = 4.34$, $p < .05$, were more strongly, negatively associated with the latent victimization slope for boys than for girls. The difference in the association between 2nd grade depressive symptoms and the latent victimization slope in girls and boys was not statistically significant, $\chi^2(1) = 2.05$, ns.

Figure 1 presents the final standardized path coefficients; superscripts denote paths for which there were significant sex differences. To ease readability of the figure, covariances between 2nd grade adjustment and the latent intercept and slope variables (described above) are not displayed. Even after accounting for significant cross-wave stability in depressive symptoms and aggressive behavior, both early and increasing victimization made unique positive contributions to 5th grade depressive symptoms, overt aggression, and relational aggression. A few significant sex differences were found. First, there was greater stability in overt aggression for boys than for girls, $\chi^2(1) = 5.37$, $p < .05$. Second, the covariance between 2nd grade overt and relational aggression was stronger for boys than for girls, $\chi^2(1) = 12.69$, $p < .001$, and the covariance between 5th grade depressive symptoms and relational aggression was stronger for girls than for boys, $\chi^2(1) = 10.47$ $p < .01$. Third, consistent with our hypotheses, sex differences were found in the paths from the intercept and slope of victimization to 5th grade relational aggression. Although these paths were significant for girls and boys, they were stronger for girls than boys for both the intercept, $\chi^2(1) = 3.15$, p

< .10, and the slope, $\chi^2(1) = 13.72$, $p < .001$.[1] None of the other paths was significantly different for girls and boys.

Discussion

Supporting the proposition that both early and increasing peer victimization contribute to children's mental health, exposure to victimization in 2nd grade and growth in victimization across 2nd to 5th grade significantly predicted heightened depressive symptoms, overt aggression, and relational aggression in 5th grade, even after adjusting for earlier levels of mental health problems. These findings suggest that early exposure to peer victimization places children at risk for lasting emotional and behavioral difficulties.

Changes in Victimization Over Time

As in some prior research (e.g., Leadbeater & Hoglund, 2009; Reavis, Keane, & Calkins, in press; Troop-Gordon & Ladd, 2005; for a review, see Smith, Madsen, & Moody, 1999), average levels of victimization declined from 2nd to 5th grade. As children's peer groups stabilize across the elementary school years, children may feel less of a need to assert their power by bullying others. Moreover, as the oldest children in school, 5th graders may be less vulnerable as targets of bullying or may have acquired stronger skills for deterring bullying or resolving problems (Smith et al., 1999). For example, children gain competence in problem solving and perspective taking (Hartup, Brady, & Newcomb, 1983; Keating, 2004) and develop stronger self-regulatory resources (Higgins, 1991) over the elementary school years, which may enable them to address peer conflicts more effectively without resorting to bullying. However, research reveals that the prevalence of peer victimization peaks during the early middle school years and then declines again across middle school (Nansel et al., 2001; Nylund et al., 2007). Thus, rates of victimization may rebound after 5th grade as concerns about social status and identity become more salient, as children develop more sophisticated cognitive and verbal skills (which may, for example, facilitate relational forms of bullying), and as children attempt to negotiate the re-organization of peer groups that occurs during middle school (Sullivan et al., 2006).

Influence of Victimization on Mental Health

Despite this average decline, children showed significant variability in their early exposure to victimization as well as their trajectories of victimization across elementary school, suggesting that a subgroup of children experienced stable or increasing levels of victimization as they progressed through school. Both initial levels and growth in victimization over time significantly predicted 5th grade depressive symptoms, overt aggression, and relational aggression. Supplemental analyses revealed a similar pattern of prediction for overt and relational victimization, suggesting that these forms of victimization have similar implications for children's mental health. These findings extend prior research by revealing that children's early exposure to victimization as well as changes in their victimization experiences over time are critical determinants of their mental health by the end of elementary school. It is notable that initial exposure to victimization exerted a long-term influence even after accounting for more proximal experiences, suggesting that even children who do not continue to experience heightened victimization are at risk for future depressive symptoms and aggressive behavior. In fact, these findings were notably robust,

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[1]To test for potential differences in the contribution of overt and relational victimization to 5th grade depressive symptoms and aggressive behavior, latent growth curve analyses were performed separately for the two types of victimization. Findings from these analyses replicated the results presented in Figure 1. Specifically, for both girls and boys, the intercept and slope of overt and relational victimization significantly predicted higher levels of 5th grade depression, overt aggression, and relational aggression; moreover, the size of the coefficients for overt and relational victimization was quite similar (average difference = .06). These findings indicate that these two forms of peer adversity make similar contributions to children's mental health.

particularly given that the latent growth model adjusted for the co-occurrence of depressive symptoms, overt aggression, and relational aggression.

Contrary to speculation, victimization similarly predicted depressive symptoms and overt aggression in girls and boys. We thought it possible that victimization would make a stronger contribution to depressive symptoms in girls and to overt aggression in boys. However, sex-differentiated vulnerability to psychopathology, reflected in surges in depression in girls (Hankin & Abramson, 2001) and surges in antisocial behavior in boys (Lahey et al., 2006), typically occurs during adolescence. Thus, early exposure to victimization may intersect with normative biological, cognitive, physical-maturational, and social-contextual changes during the adolescent transition to trigger sex-specific pathways to psychopathology that have not yet emerged during the elementary school years.

Consistent with expectations, both initial victimization and increasing victimization over time more strongly predicted 5th grade relational aggression in girls than in boys. Some research suggests that girls are more likely than boys to use relational forms of aggression, such as social manipulation and exclusion, to assert their power (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992;; cf. Card et al., 2008; Crick & Grotpeter, 1995). Thus, girls may resort to such tactics in response to being victimized by their peers. It is possible that a downward spiral develops over time, wherein (1) victimization prompts girls to engage in relational aggression during elementary school, and (2) relational aggression elicits negative responses (e.g., retaliation, rejection) from peers that heighten girls' risk for depressive symptoms during adolescence. The present findings support the first step of this cycle. Moreover, prior research suggests that engaging in relational aggression predicts subsequent peer rejection in girls but not in boys (Crick, 1996), and that trajectories of relational aggression are linked to increasing internalizing symptoms over time (Murray-Close, Ostrov, & Crick, 2007). It will be intriguing for future research to investigate how these types of pathways unfold across the transition to adolescence, when girls show surges in their rates of depression.

Influence of Mental Health on Victimization

Our models also enabled us to examine the reciprocal effects of early depressive symptoms and aggressive behavior on changes in victimization over time. Although 2nd grade depressive symptoms, overt aggression, and relational aggression were significantly positively associated with initial levels of victimization, they predicted decreasing victimization over time in boys. Prior research provides some support for reciprocal effects of mental health difficulties on subsequent victimization, although these findings have been inconsistent and often depend on a variety of moderators (Hodges et al., 1997; Leadbeater & Hoglund, 2009; McLaughlin et al., 2009; Snyder et al., 2003). Of interest, another study also found that antisocial behavior predicted decreasing levels of victimization over time in boys (Snyder et al., 2003). It is possible that aggression has an inhibitory effect on bullying because peers feel less comfortable aggressing against children who might retaliate. Moreover, engaging in relational aggression can help children to recruit a subgroup of peers as allies, perhaps protecting them against bullying by peers.

It is less clear why 2nd grade depressive symptoms predicted declining victimization over time in boys. Although depressive symptoms might elicit negative reactions from peers, there is some evidence that depression-related behaviors such as social withdrawal are not viewed as atypical or aversive by younger children and do not elicit heightened peer rejection or victimization (Ladd & Burgess, 1999; Younger & Piccinin, 1989; for a review, see Rubin & Coplan, 2004). Consistent with this idea, a prior study found that initial levels of depressive symptoms in kindergarten did not predict increasing victimization in boys, although boys who showed increasing depressive symptoms did experience increasing victimization over time (Snyder et al., 2003). Of interest, young children actually show

relatively positive views of hypothetical peers who display socially withdrawn (i.e., shy) behavior (Coplan, Girardi, Findlay, & Frohlick, 2007), as well as those who display depressive symptoms and also experience significant stressors (Petersen, Mullins, & Ridley-Johnson, 1985). Thus, it is possible that depressive symptoms displayed during the early school years do not consistently elicit victimization from peers, and may even elicit sympathy (Coplan et al., 2007; Peterson et al., 1985), but they undermine peer relationships if displayed continuously over time. Future research would benefit from continued examination of reciprocal-influence models that consider the dynamic transactions between victimization and mental health over time.

The present research provides several advances beyond previous studies examining the mental health consequences of victimization. Most notably, the inclusion of both static and dynamic indicators of victimization and the relatively long-term follow-up sheds light on the relative influence of distal versus proximal experiences of victimization. Moreover, the dual-informant report of victimization avoids biases that arise from subjective perspectives and shared method variance with assessments of adjustment. Whereas past research often has relied on only a few indicators of victimization, this study included a comprehensive assessment of victimization experiences, perhaps helping to explain the robustness of the findings. Finally, this research used very specific assessments of mental health and adjusted for their co-occurrence, providing the opportunity to evaluate the unique effects of victimization on each type of mental health difficulty. Including a measure of relational aggression also yielded novel findings regarding one sex-differentiated effect of victimization.

Limitations

Despite the contribution of this research, there are several limitations that suggest important directions for future research. First, this study relied on child and teacher reports of victimization, which builds on prior work using mono-informant measures. However, research suggests that children, teachers, peers, and parents provide unique perspectives on victimization that are concurrently linked to differing types of adjustment difficulties (Graham, Bellmore, & Juvonen, 2007; Ladd & Kochenderfer-Ladd, 2002). Moreover, a multi-informant composite of victimization appears to provide the most reliable indicator of victimization and the best estimator of adjustment during middle childhood (Ladd & Kochenderfer-Ladd, 2002). Thus, it would be beneficial for future research to incorporate a variety of informants and methods to determine which best predict particular long-term mental health consequences of victimization.

Second, this research documented a prospective contribution of peer victimization to depressive symptoms and aggressive behavior, but did not elucidate the processes through which these problems emerge. Exposure to victimization may compromise children's self-worth and self-efficacy, fostering negative self-perceptions and a sense of helplessness. Indeed, research links victimization to self-blaming attributions (Graham & Juvonen, 1998) and less positive perceptions of the self (Egan & Perry, 1998). Moreover, negative self-perceptions mediate between victimization and increasing levels of internalizing symptoms (Troop-Gordon & Ladd, 2005). When children are victimized by their peers, they also are deprived of critical socialization opportunities that foster the development of effective emotion-regulation skills. Supportive of this path, exposure to victimization is linked to heightened emotion dysregulation (Rudolph, Troop-Gordon, & Flynn, 2009), which mediates between victimization and internalizing symptoms (McLaughlin, Hatzenbuehler, & Hilt, 2009). Finally, persistent exposure to victimization may foster a sense of social alienation, causing children to develop pessimistic or hostile beliefs about their peers. Consistent with this idea, victimization predicts more hostile intent attributions (Hoglund & Leadbeater, 2007; Schwartz et al., 1998; Yeung & Leadbeater, 2007) and negative peer

belief systems (Rudolph et al., 2009; Salmivalli & Isaacs, 2005; Troop-Gordon & Ladd, 2005), which may help to account for subsequent aggression. Future prospective research that explicitly identifies the processes through which victimization influences mental health will be vital for developing more refined theoretical models of peer victimization and its effects.

Third, this study did not consider factors that contribute to individual variation in the long-term mental health consequences of victimization. In light of theory and research suggesting that some children are more susceptible than others to environmental adversity (Boyce & Ellis, 2005), the field would benefit from identifying characteristics of children and their environments that make them particularly vulnerable or resilient to the adverse long-term effects of victimization. Preliminary research suggests, for example, that children with particular temperamental styles (e.g., poor inhibitory control, high negative emotionality; Sugimura & Rudolph, 2010) and social risks (e.g., friendlessness; Hodges, Boivin, Vitaro, & Bukowski, 1999) are especially vulnerable to the short-term consequences of victimization; additional work is needed to determine whether these or other personal and social risks shape the severity and nature of long-term mental health consequences.

Fourth, this research examined the effects of victimization across one specific developmental period spanning the elementary school years. Additional work is needed to determine whether the consequences of victimization are similar across other developmental stages. For example, the adverse mental health effects of victimization may be amplified by the progression through middle school, a stage marked by increasing academic and social challenges that may overwhelm the resources of victimized children. Specifically, the emotional and behavioral consequences of victimization that emerge by the end of elementary school may interfere with children's ability to navigate the middle school transition, thereby fueling a persistent cycle of victimization and psychopathology. Furthermore, depressive symptoms and aggressive behavior may become increasingly strong elicitors of victimization across development. Given the possibility for transitions to serve as turning points toward either health or psychopathology, it will be essential for future research to elucidate the transactions between victimization and mental health across developmental stages.

Finally, this research involved a community sample of children with relatively low mean levels of depressive symptoms and aggressive behavior. The variable-centered approach to analysis makes it difficult to draw conclusions about the absolute level of mental health difficulties experienced by children with higher initial exposure to victimization or increasing victimization over time. Contemporary conceptualizations, derived in part from taxometric analyses, suggest that psychopathology is best represented by continuous dimensions rather than discrete categories (Hankin, Fraley, Lahey, & Waldman, 2005; Lahey et al., 2008), leading us to expect that the findings would replicate in youth with diagnostic-level symptoms However, it would be useful for future research to identify the critical threshold of victimization exposure at which children are likely to develop clinically significant mental health problems.

Implications for Research, Policy, and Practice

Overall, the present research confirms the critical importance of developing effective policies and practices aimed at creating environments that prohibit bullying and bolster the resources of victimized children. Specifically, the additive contributions of early victimization experiences and more recent shifts in victimization to children's depressive symptoms and aggressive behavior suggest that efforts should be directed toward identifying early victims of bullying, helping them to develop adaptive coping strategies, and preventing escalations in bullying over time. These efforts will likely need to involve both school-wide

and individually based approaches that modify school ecologies while also providing victims with the requisite skills to deter bullying and to manage its emotional and behavioral consequences.

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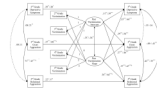
Figure 1.
Latent growth curve analysis of the contribution of initial victimization (2nd grade) and trajectories of victimization (2nd – 5th grade) to 5th grade depressive symptoms, overt aggression, and relational aggression, adjusting for 2nd grade adjustment. Coefficients for boys are on the left of the slash and coefficients for girls are on the right of the slash. Not shown are covariances between 2nd grade adjustment (i.e., depressive symptoms, overt aggression, and relational aggression) and the intercept and slope of the victimization trajectories (see text). Also not shown is a significant covariance between 3rd and 4th grade victimization. [a]Sex difference at $p < .05$. [b]Sex difference at $p < .10$.

Table 1

Descriptive Statistics

	Girls			Boys		
	M	SD	α	M	SD	α
2nd Grade Depressive Symptoms	1.71	0.67	0.88	1.76	0.67	0.86
5th Grade Depressive Symptoms	1.58	0.66	0.93	1.48	0.56	0.90
2nd Grade Overt Aggression	1.29^c	0.76	0.96	1.80^c	1.10	0.96
5th Grade Overt Aggression	1.33^b	0.81	0.97	1.61^b	0.97	0.96
2nd Grade Relational Aggression	2.12^a	0.94	0.92	1.90^a	0.86	0.91
5th Grade Relational Aggression	2.12^c	1.02	0.93	1.67^c	0.65	0.81
2nd Grade Peer Victimization	1.91	0.55	0.93	2.00	0.54	0.92
3rd Grade Peer Victimization	1.90	0.55	0.95	1.96	0.55	0.94
4th Grade Peer Victimization	1.77	0.50	0.95	1.88	0.57	0.95
5th Grade Peer Victimization	1.75	0.55	0.95	1.72	0.50	0.95

[a] Means significantly differ at $p < .05$.

[b] Means significantly differ at $p < .01$.

[c] Means significantly differ at $p < .001$.

Table 2

Intercorrelations among the Measures

	1	2	3	4	5	6	7	8	9	10
1. 2nd Grade Depressive Symptoms	---	.26***	.08	.11	−.00	.05	.43***	.29***	.21**	.15^
2. 5th Grade Depressive Symptoms	.33***	---	−.02	.10	−.09	.12	.17*	.31***	.35***	.47***
3. 2nd Grade Overt Aggression	.21**	.06	---	.53***	.73***	.32***	.53***	.25***	.23**	.19*
4. 5th Grade Overt Aggression	.23**	.18**	.25***	---	.32***	.56***	.41***	.37***	.37***	.37***
5. 2nd Grade Relational Aggression	.12	.15*	.47***	.30***	---	.27***	.43***	.16*	.03	.07
6. 5th Grade Relational Aggression	.20**	.10	.30***	.60***	.35***	---	.34***	.23**	.21**	.34***
7. 2nd Grade Peer Victimization	.43***	.30***	.24***	.28***	.42***	.29***	---	.37***	.39***	.36***
8. 3rd Grade Peer Victimization	.36***	.24***	.30***	.30***	.36***	.34***	.55***	---	.62***	.40***
9. 4th Grade Peer Victimization	.26***	.38***	.24***	.33***	.32***	.34***	.40***	.52***	---	.56***
10. 5th Grade Peer Victimization	.34***	.43***	.19**	.48***	.30***	.57***	.49***	.48***	.55***	---

Note. Intercorrelations presented above the diagonal are for boys; intercorrelations presented below the diagonal are for girls.

^
$p < .10$

*
$p < .05$.

**
$p < .01$.

***
$p < .001$.