
REGULAR ARTICLE

Child and context characteristics in trajectories of physical and relational victimization among early elementary school children

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Abstract

Transactional models suggest that peer victimization results from both individual and context differences, and understanding these differences may point to important targets for prevention and interventions that reduce victimization. Multilevel modeling was used to examine within-person (aggression and emotional dysregulation), between-person (sex and age), and between-school (participation in a victimization prevention program) factors that influence changes in physical and relational victimization over the first three years of elementary school. Children ($n = 423$) reported their experiences of peer victimization at entry into Grade 1 and at the end of Grade 1, Grade 2, and Grade 3. On average, trajectories of both physical and relational victimization declined. However, for individual children, teacher-rated aggression was associated with increases in physical and relational victimization, while emotional dysregulation was associated with attenuation of longitudinal declines in physical victimization and increases in relational victimization. Individual differences in sex and age at entry into Grade 1 did not significantly influence victimization trajectories over Grades 1 to 3. Children who participated in the WITS® victimization prevention program showed significant declines in physical and relational victimization. Levels of victimization among nonparticipants remained stable. Implications of child and context characteristics for preventing peer victimization in elementary school are discussed.

Peer victimization is a common stressor among school-aged children that can interfere with healthy developmental outcomes. Victims of bullying, particularly those who are repeatedly victimized or who also behave aggressively toward their peers, are at increased risk for psychosocial and behavioral adjustment problems, including loneliness, low self-esteem, anxiety and depression, externalizing problems, and disengagement from school (Hanish & Guerra, 2002; Kochenderfer-Ladd & Skinner, 2002; Kochenderfer-Ladd & Wardrop, 2001; Leadbeater & Hogg, 2009). Past research with community-based samples estimates that between 10% and 30% of children are chronic victims of peer aggression, and higher percentages are more likely in early grades (Hanish & Guerra, 2002; Hawker & Boulton, 2000; Kochenderfer & Ladd, 2001).

Transactional models of development view psychopathology as the product of individual differences in transaction with environmental adversities (Cicchetti & Toth, 1997); however, no re-

search has demonstrated that changes in peer victimization are linked with changes in child characteristics over time, or that changes in context can moderate victimization trajectories. In this study, we examine individual-level and school-level influences on victimization trajectories in elementary school children from the beginning of first grade to the end of third grade.

Patterns of Victimization Over the Elementary School Years

Early experiences of victimization are linked to continuity in victim–bully relationships in middle school (Kochenderfer-Ladd & Wardrop, 2001; Schwartz, Dodge, Pettit, & Bates, 1997; Schwartz, Proctor, & Chien, 2001); however, patterns of victimization during the early elementary school years tend to be less stable than in later school years. Stability coefficients for victimization among middle school children range from ~ 0.45 to ~ 0.75 from one school year to the next (Boulton & Smith, 1994), but they typically range from ~ 0.20 to ~ 0.40 among elementary school children (Ladd & Kochenderfer-Ladd, 2002). The early school years are clearly an important period for understanding the developmental processes that explain why some but not other children are repeatedly victimized and how changes in victimization are related to changes in their behaviors and contexts over time. Furthermore, the early school years delineate a period of rapid social, emotional, cognitive, and personality development during which

This research was supported by grants from the Canadian Institutes of Health Research (CAR-4327) and the Social Sciences and Humanities Research Council of Canada (410-2000-0748). We also appreciate the support of the Rock Solid Foundation of British Columbia and extend our thanks to the principals, teachers, parents, and students of Greater Victoria School District 61 and the comments of three anonymous reviewers.

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intervention and prevention programs may have considerable impact on interrupting peer victimization before it becomes inveterate (Ladd, 1996; Olweus, 1994).

Two forms of peer victimization have been distinguished in the literature: physical and nonphysical. When victimization is chronic, both types usually involve a power differential (in age, size, or social status, etc.) favoring the perpetrator over the victim. Physical victimization is the consequence of another's intent to hurt, harm, or injure with physical force or threats of force (hitting, shoving, pushing, threatening). The distinctions among potentially distinct types of nonphysical (indirect, relational, or social) aggression have been the subject of considerable debate among researchers (Archer, 2004; Björkqvist, Lagerspetz, & Kaukiainen, 1992; Coyne, Archer, & Eslea, 2006; Underwood, Galen, & Paquette, 2001; Xie, Cairns & Cairns, 2005). In this study, we also investigate relational victimization (Crick & Grotpeter, 1995) defined as the consequences of intentional efforts to disrupt peer relationships by social exclusion, ignoring, spreading malicious rumors, gossiping, or threats to end the relationship. Physical and relational victimization are typically moderately to highly correlated (Card, Stucky, Sawalani, & Little, 2008; Hawker & Boulton, 2000). Nevertheless, understanding the differences between these subtypes of victimization is important for prevention efforts (Leadbeater, *in press*; Leadbeater & Høglund, 2009; Ostrov et al., 2009; Yeung & Leadbeater, 2007). Finally, longitudinal research indicates that physical victimization (and its corollary, physical aggression) typically declines in elementary school (Brame, Nagin, & Tremblay, 2001; Cairns, Cairns, Neckerman, Ferguson, & Gariépy, 1989; Côté, Vaillancourt, Barker, Nagin, & Tremblay, 2007; NICHD Early Child Care Research Network, 2004; Tremblay et al., 2004; Vaillancourt, Hymel, & McDougall, 2003). However, longitudinal studies of changes in social, relational or indirect aggression are rare, and there is some evidence that the use of social aggression increases in late childhood and early adolescence for both boys and girls (Björkqvist et al., 1992; Harachi et al., 2006; Leadbeater, Høglund, & Woods, 2003; Salmivalli & Kaukiainen, 2004; Underwood, 2003; Xie et al., 2005). Hence, we examine these subtypes separately in this study. However, the correlations among physical and relational aggression and the paucity of past longitudinal research examining intraindividual trajectories of these subtypes discourage us from making separate hypotheses about their predictors.

Child Characteristics Associated With Victimization

Children's emotional displays and aggressive behaviors in response to peer victimization have been linked to the perpetuation of victimization (Hanish, Eisenberg, Fabes, Spinrad, Ryan, & Schmidt, 2004; Jensen-Campbell, Knack, Waldrip, & Ramirez, 2009; Rosen, Milich, & Harris, 2009; Shields & Cicchetti, 2001), yet little is known about their longitudinal association with patterns of peer victimization. Emotion regulation refers to "a multifaceted phenomenon whose development arises from the growth and integration of many behavioral and

biological processes" (Thompson, Lewis, & Calkins, 2008, p. 124) that are also influenced by family socialization and cultural norms (Cole, Dennis, Smith-Simon, & Cohen, 2009; Eisenberg, Champion, & Ma, 2004; Morris, Silk, Steinberg, Myers, & Robinson, 2007). Excessive expressions of negative emotions are frequent in descriptions of victims' responses to bullying. Several observational studies have noted that children who were frequently victimized became visibly upset by the interaction (Patterson, Littman, & Bricker, 1967; Schwartz, Dodge, & Coie, 1993). Olweus (1978), for example, found that victimized children frequently displayed overt distress, including tearfulness, anger, and crying. Poor emotional control can also result in poorly crafted social exchanges from which more skilled peers generate opportunities to advance their own social status and power by victimizing the emotionally vulnerable child (Veenstra et al., 2007). However, gender may influence these patterns. Hanish et al. (2004) showed that young boys who are victimized early in the school year showed contemporaneous angry, aggressive behaviors, possibly reflecting their efforts to establish dominance in a new social group. By the spring semester, however, it was boys who did *not* engage in angry aggressive peer interactions who were more likely to be victimized. In contrast, girls who displayed anger were more likely to be victimized over time, and the link between anger expression and peer victimization was accounted for by poor regulatory skills (e.g., lack of capacity for sustained attention and inhibitory control). Furthermore, emotionally dysregulated children may become marginalized or rejected if their peers find their emotional behavior aversive (Casey & Schlosser, 1994; Dearing et al., 2002; Eisenberg et al., 1997; Hubbard & Coie, 1994), robbing these children of protective friendships that could help prevent bullying (Høglund & Leadbeater, 2004).

Many studies with children and adolescents also show links between physical aggression and peer victimization concurrently and over time (Hanish & Guerra, 2002; Kochenderfer-Ladd, 2003; Leadbeater, Boone, Sangster, & Mathieson, 2006; Leadbeater & Høglund, 2009; Morrow, Hubbard, McAuliffe, Rubin, & Dearing, 2006). It is notable that studies have shown that young children who respond to bullying with aggression are more likely to remain in a bully-victim relationship than those who do not (Mahndy Wilton, Craig, & Pepler, 2000; Leadbeater & Høglund, 2009). Children who engage their peers in aggressive interactions are likely to display hostility and defensive posturing that can prolong their engagement with bullies and evoke further victimization from an already hostile bully (Kochenderfer-Ladd, 2004).

In a four-wave longitudinal study of children in kindergarten to Grade 3, Kochenderfer-Ladd and Wardrop (2001) classified children as victims based on their reported frequency of experiencing physical or verbal victimization, with 14% classified as victims at three or more time points. In a second study with the same sample (Kochenderfer-Ladd, 2003), cluster analyses indicated that 22% to 36% of the victimized children were also physically aggressive. Early levels of physical aggression predicted increases in the frequency of victim-

ization in Grade 1 and in chronic victimization over time. Similarly, in a previous report of the current sample, Leadbeater and Hoglund (2009) found that children's physical aggression on entry to Grade 1 increased risks for victimization by the end of Grade 2, which in turn was related to increases in physical aggression by the end of Grade 3.

Contexts That Support or Reduce Peer Victimization

Accumulating research demonstrates that the use of aggression against peers interacts with social norms in schools, neighborhoods, families, and communities to augment or reduce aggressive peer interactions (Aber, Jones, Brown, Chaudry, & Samples, 1998; Bagwell, 2004; Bellmore, Witkow, Graham, & Juvonen, 2004; Bukowski & Sippola, 2001; Graham, Bellmore, & Mize, 2006; Hoglund & Leadbeater, 2004). Context also appears to affect intervention efforts (Aber et al., 1998; Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Leadbeater et al., 2003). Evaluating a classroom intervention (the Good Behavior Game) directed at reducing children's aggressive behaviors, Kellam et al. (1998) found that placement in first grade classrooms with higher aggregate levels of physically aggressive peers (rated by teachers) contributed to boys' (but not girls') aggressive behaviors in middle school, independent of family and school-level poverty. Similarly, Aber et al. (1998), investigating classroom and neighborhood contexts effects on the effectiveness of a violence prevention program (Resolving Conflicts Creatively), found that expected reductions in children's aggressive cognitions were diminished for children who lived in poorer, more violent neighborhoods and attended classrooms in which more children rated the use of aggression as "perfectly OK." In our previous work with the current sample (Leadbeater et al., 2003), we showed that classroom levels of relational and physical victimization decreased significantly in schools participating in a program that seeks to alter school contexts to reduce peer victimization (the WITS® program) compared to control schools. Effects of this whole school program (described below) on classroom levels of victimization were stronger in schools with *greater* numbers of children from families on income assistance. Classroom levels of teacher-rated social competence, emotional problems, and behavioral problems were also favorably influenced by participation in the program. This research suggests that changes in school and classroom norms are important to the reduction of victimization in elementary schools.

The Present Study

The general objective of the present study was to identify individual-level and school-level factors that are associated with longitudinal changes in peer victimization. There are three specific aims for this study. The first aim was to characterize the developmental trajectory of victimization over the early elementary school years. Cross-sectional studies have shown that levels of victimization, especially physical victimization, are initially quite high among early elementary

school children but decrease during the elementary school years (Hanish & Guerra, 2000; Olweus, 1994). We expected that individual patterns of physical victimization would, on average, decline in early elementary school grades. The trajectory of relational victimization is less well established in the literature, and some research suggests it may increase in elementary and middle school students. The second aim was to identify child characteristics that are developmental covariates of within-child victimization trajectories. Given that both aggression and emotional dysregulation have been previously linked to victimization in early elementary school children, we hypothesized that these problems would covary positively with victimization over time. More specifically, we hypothesized that on occasions when victimization was high for individual children, aggression and emotional dysregulation would also be high. The third aim was to assess between-child moderators of individual differences in victimization trajectories. Previous studies have suggested that patterns of victimization are related to age, sex, and school context. Consistent with the literature, we hypothesized that being younger than one's peers at entry into Grade 1 would be associated with higher levels of victimization because younger children tend to be more physically aggressive and emotionally dysregulated than older children (Kopp, 1989; Tremblay et al., 2004). Further, and in keeping with previous reports, we hypothesized that being male would be associated with higher levels of physical victimization and that participating in the WITS victimization prevention program would be associated with decreases in both physical and relational victimization from Grade 1 to 3.

Methods

Participants

Children ($n = 432$) were recruited in the fall of Grade 1 (51% boys; average age = 6.3 years, $SD = 0.32$) from 44 classrooms in 17 public schools in a medium-sized Canadian city. Baseline data were gathered in the fall of Grade 1. Follow-up data were collected in the spring of Grade 1 (Time 1, $n = 423$, 98% retention rate), Grade 2 (Time 2, $n = 397$, 92%) and Grade 3 (Time 3, $n = 385$ children, 89.1%). Children not followed had moved out of the school district and refusals to continue to participate were rare. Participants were also involved in an evaluation of the WITS peer victimization prevention program (see Leadbeater & Hoglund, 2006; Leadbeater et al., 2003).

According to parent reports at baseline, 65% of children lived in a two-parent household. Mothers' education ranged from eighth grade to university graduate-level education, with the average level being some college or technical training beyond high school. Thirty-two percent of children lived in a household with an annual income under \$30,000 (range = <\$8,500 to >\$50,000/year). Children represented a range of ethnicities: 73% European Caucasian, 9% Southeast and East Asian, 4% South Asian, 7% Aboriginal, and 5% other (e.g., Hispanic, Caribbean). Two percent did not report. For 73% of the children, English was the only language spoken at home.

Procedure

Evaluation packages were sent to all parents of first grade children in participating schools informing them of the study and seeking consent for participation. Eleven schools were implementing the WITS program while six served as comparison schools. Consent rate for different schools ranged between 47% and 91% (overall 64%). Children who did not speak English and children with language difficulties (e.g., because of autism) were not included. Parents who granted consent completed a demographic questionnaire as well as several other questionnaires that are not reported here. Teachers completed questionnaires rating a broad range of child problems, including measures of aggression and emotional dysregulation. Children completed questionnaires reporting their experiences of victimization and their interpersonal negotiation strategies (not used in the current analyses) in small class groups ($n = 5-20$). All questions were read out loud, and one research assistant sat between pairs of children to monitor their placement of responses and answer questions.

WITS Intervention. This school-based approach engages teachers, parents, and school-based police liaisons in helping schools create environments where it is normative to get adult help by reporting peer victimization. The WITS actions (walk away, ignore, talk it out, and seek help) are not intended as social skills children should try in isolation, but are rather intended to create a common language that connects victimized children with adults who can help them. By making dealing with and reporting victimization normative, adults work to both discourage bullying interactions and to scaffold non-assertive and reduce aggressive behaviors of victims that make them vulnerable. Walking away and ignoring is encouraged as first steps to disengaging from a bully-victim relationship and for getting adult support to end the bullying. Visits from community-based police liaisons are used to affirm children's right to feel safe at school. Outreach to parents included WITS resource pamphlets and trinkets (e.g., refrigerator magnets) with WITS messages that children take home. Teachers' implementation of the program is supported by classroom activities and curricula that are based on publicly available books. The curricula are also integrated into the British Columbia language arts and social responsibility curriculum guidelines (see the WITS manual at <http://www.youth.society.uvic.ca>).

Levels of program implementation, which are assessed in the spring of each year, showed that all schools had police involvement in initiating the program and principal endorsement of the program. The majority of teachers in each program school endorsed the program and reported using books from the WITS booklist, recognizing a student for using his or her WITS to solve a conflict, used WITS class activities, displayed WITS projects and posters in their class, and had a class visit by the school police liaison (for details, see Leadbeater et al., 2003).

Measures

Peer victimization was measured from self-reported episodes of relational and physical victimization on the Social Experiences Questionnaire (Crick & Grotpeter, 1995). Children were told "Here is a list of things that sometimes happen to kids your age at school" and asked "How often do they happen to you?" Two practice items were used to help children understand the response scale, followed by 10 items that were read out loud. The 5 relational victimization items tap experiences of social exclusion and friendship restriction (e.g., "other kids leave you out on purpose," "other kids say they won't like you unless you do what they want you to do," "other kids keep other students from liking you"). The 5 physical victimization items assess incidents of physical harm and threats of harm (e.g., "get hit by another student," "other kids kick you or pull your hair," "other kids say they will beat you up"). Items were rated on a 3-point scale depicted pictorially to help younger children understand the scaling ($\square = \text{never}$, $\square = \text{sometimes}$, $\square = \text{almost all the time}$). This was adapted from the original 5-point scale to reduce the difficulty for this young age group. Victimization scores were summed. Physical and relational victimization were strongly correlated at each time point ($r_s = .56-.72$); however, they are modeled separately to allow for different trajectories over time as well as different longitudinal associations with physical aggression and emotional dysregulation.

Physical aggression and emotional dysregulation were assessed from teacher reports on the Early School Behavior Rating Scale (Caldwell & Pianta, 1991) at each time point. The teacher version included 40 items that assess a variety of problematic behavioral (e.g., aggression, inattentiveness), emotional (e.g., crying, temper tantrums), and social (e.g., not adhering to rules, uncooperative with peers and adults) indicators. Items were rated on a 4-point scale (1 = *hardly ever*, 4 = *almost always*). We selected the items that best represented the constructs of *physical aggression* and *emotional dysregulation*. For physical aggression, we selected three items that reflected clear physically aggressive behaviors in early childhood: "destroys other children's property," "fights with other children," and "kicks other children." For emotional dysregulation, we choose four items: two that indicate a low threshold for activating experiences of emotion "is easily upset by failures," and "feelings easily hurt, oversensitive" and two indicative of difficulty modulating the expression of emotion: "cries easily," "has temper tantrums." These items were selected to tap key aspects of emotional dysregulation (Gross & Thompson, 2007) and to reflect the content of other, established measures of emotion regulation (e.g., Shields & Cicchetti, 1997).¹

1. We conducted a principal components analysis to confirm our theoretical selection of items. Despite slight variations in the factor structure of the Early School Behavior Rating Scale over Grades 1-3, the items of our emotional dysregulation measure consistently loaded on the same factor. Two other items that consistently loaded on this factor ("worries" and "gives up") were eliminated because these items do not prima facie indicate emotional dysregulation.

Symptoms of social anxiety, depression, withdrawal, loneliness, shyness, and asocial tendencies that were not exclusively characteristic of physical aggression or emotional dysregulation were excluded from our analysis.

Because we were interested in adjustment problems that are evident at school, only teacher reports of aggression and emotional dysregulation were used in this study. Teacher and parent reports of aggression and emotional dysregulation were low to moderately correlated at each time point (e.g., aggression: $r_s = .31-.43$; emotional dysregulation: $r_s = .15-.28$). Combined parent-teacher scores may be more reliable indicators of these constructs; they were not used because parent-reported data were available for only 80% of children at Time 1, 75% of children at Time 2, and 70% of children at Time 3. Although peer judgments of aggression and emotional dysregulation may be more proximal predictors of the link between these problems and peer victimization, they could not be collected because of logistical and ethical concerns of our school district.

Attrition for child- and teacher-reported data was minimal across the three years and four waves of data collection. Comparison of children who dropped out of the study ($n = 47$; 10.9%) with children who remained at the final assessment point ($n = 385$) on baseline demographic variables indicated that children who dropped out had higher socioeconomic status risks; that is, compared to children who remained in the study, children who dropped out experienced more family socioeconomic status risks (means = 1.68 vs. 0.79, range = 0-4) and attended schools with more low-income students (means = 13.98% vs. 11.62%, range = 3%-24%).

Statistical procedures

Multilevel equations were specified at three levels to account for the nested data structure (measurement occasion nested within student nested within school). The Level 1 model (Equation 1) fits an individual slope for each person where victimization for child i on four separate measurement occasions j (baseline, fall of Grade 1; spring of Grade 1, 8 months from baseline; spring of Grade 2, 1 year and 8 months from baseline; and spring of Grade 3, 2 years and 8 months from baseline) is a function of the child's victimization at baseline (π_{0i}), plus a slope parameter (π_{1i}) reflecting individual rate of linear change in victimization across time, plus an error term (σ_{ij}) reflecting within-person residual variance about the child's best fitting slope. Centering time at zero (to reflect baseline assessment) results in π_{0i} being interpreted as child i 's expected score at baseline. Relative to a standard generalized linear modeling model, which assumes no individual differences and estimates a single regression equation for all individuals, Equation 1 estimates both *fixed* effects (average person intercepts and slopes) and *random* effects (person-specific variability across measurement occasion).

$$\text{victimization}_{ij} = \pi_{0i} + \pi_{1i}(\text{time}_{ij}) + \sigma_{ij}. \quad (1)$$

The Level 2 model treats the Level 1 intercepts and slopes as dependent measures in order to estimate between-person

variance in these within-person parameters. Equation 2, individual intercepts (π_{0i}) derived from Equation 1 are modeled as a function of average victimization at baseline (β_{00}), plus a random effect (ε_{0i}) to estimate between-person differences in initial levels of victimization. Equation 3 models each individual's predicted rate of victimization across the 2-year and 8-month period (π_{1i}) as a function of the population average rate of victimization per additional year of measurement (β_{10}), plus individual variability (ε_{1i}) estimating between-person differences in rate of victimization.

$$\pi_{0i} = \beta_{00} + \varepsilon_{0i}, \quad (2)$$

$$\pi_{1i} = \beta_{10} + \varepsilon_{1i}. \quad (3)$$

The Level 3 model treats the Level 2 intercepts and slopes as dependent measures in order to estimate between-school effects in the between-person parameters. For Equation 4, individual intercepts (β_{00i}) derived from Equation 2 are modeled as a function of average school-level rates of victimization at baseline (γ_{000}), plus a random effect (u_{00i}) to estimate between-school differences in initial levels of victimization. Equation 5 models each individual's predicted rate of victimization across the 2-year and 8-month period (β_{10i}) as a function of the school population average rate of victimization per additional year of measurement (γ_{100}), plus a school variability random effect (u_{10i}) estimating between-school differences in rates of victimization.

$$\beta_{00i} = \gamma_{000} + u_{00i}, \quad (4)$$

$$\beta_{10i} = \gamma_{100} + u_{10i}. \quad (5)$$

The models described by Equations 1-5 are used to address our first aim of characterizing the longitudinal trajectories of victimization. In this study, the time-based models described in Equations 1-5 were extended in two ways. First, to identify intraindividual covariates of victimization, we constructed a *time-varying covariation model* by including physical aggression and emotional dysregulation as additional time-varying covariates in the Level 1 model. The Level 1 model for this analysis (Equation 6) differs from the model depicted in Equation 1 in that we postulate that in addition to changes in victimization because of time, victimization also changes as a function of changes in a child's aggression and emotional dysregulation. In other words, the model assumes that victimization at any given time depends upon (a) the amount of time since baseline, (b) the child's contemporaneous physical aggression, (c) the child's contemporaneous emotional dysregulation, and (d) person-specific and school-specific residuals. The slope parameter (β_{1i}) in this model reflects an individual rate of linear change in victimization across time controlling for physical aggression and emotional dysregulation, whereas the slope parameters (β_{2i} and β_{3i}) assess whether higher (or lower) aggression or emotional dysregulation on specific occasions are linked to higher (or lower) victimization scores independent of linear changes in victimization across time. As with previous models,

time was modeled as years since baseline. Aggression and emotional dysregulation were centered at zero, to reflect rates of victimization when aggression and emotional dysregulation are not present. Time-varying covariation between Level 1 variables indicates that scores on these variables “travel together” over time.

$$\text{victimization}_{ij} = \pi_{0i} + \pi_{1i}(\text{time}_{ij}) + \pi_{2i}(\text{aggression}_{ij}) + \pi_{3i}(\text{emotional dysregulation}_{ij}) + \sigma_{ij}. \quad (6)$$

In order to achieve our third aim to identify individual and context differences that moderate victimization trajectories, we extend the basic model by adding candidate moderator variables (age, sex, and program participation) in the Level 2 and 3 models (Equations 7–10). These models evaluate whether variance in the Level 1 intercepts and slopes (i.e., individual differences in initial status or time-based rates of change in victimization) is conditioned by these between-person (Equations 7 and 8) and between-school (Equations 9 and 10) factors

$$\pi_{0i} = \beta_{00} + \beta_{01}(\text{age}_i) + \beta_{02}(\text{sex}_i) + \varepsilon_{0i}, \quad (7)$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{age}_i) + \beta_{12}(\text{sex}_i) + \varepsilon_{1i}, \quad (8)$$

$$\beta_{00i} = \gamma_{000} + \gamma_{001}(\text{program}_i) + u_{00i}, \quad (9)$$

$$\beta_{10i} = \gamma_{100} + \gamma_{101}(\text{program}_i) + u_{10i}. \quad (10)$$

HLM 6.06 software (Raudenbush, Bryk, & Congdon, 2004) was used to fit these equations separately to the physical or relational victimization data, and standard errors were estimated using full information maximum likelihood.² Where variance terms were not reliable, they were trimmed from the model (Snijders & Bosker, 1999).

Results

Descriptive data

Psychometric data and mean levels of the physical and relational victimization, physical aggression, and emotional dysregulation at each time point are presented in Table 1.

Time-based trajectories of physical and relational victimization

To establish the basic time-based trajectories of physical and relational victimization over time, the inferential test of the Equation 3 fixed effect addressed whether victimization scores change significantly over the early elementary school years. Table 2 summarizes results from these initial models. The negative slope coefficients for time (β_{10}) reflect significant declines in both physical ($\beta = -0.31, p < .001$) and relational ($\beta = -0.19, p < .05$) victimization over time. In

terms of baseline victimization, this represents an average decline of 11% (0.31/2.77) in physical and 7% (0.19/2.70) in relational victimization for each additional year from baseline. Over the course of Grades 1 to 3, the average levels of physical and relational victimization declined by 31% (11% \times 2.75 years) and 19% (7% \times 2.75 years), respectively. Notably, the random slope effect in the level 2 (ε_{1i}) and level 3 (u_{10i}) models were significant, indicating reliable between-person and between-school differences about the average victimization slope.

Separate variance components were used to calculate the proportion of total variance in victimization that was associated with between-school, between-person, and within-person sources. As shown in Table 2, school-level differences accounted for a relatively small proportion (4%–5%) of overall variance in victimization, whereas between-person differences accounted for an additional 50%–52%. The remaining 43%–46% of variance in victimization was because of within-person sources. To summarize, trajectories of victimization decreased over time and there was evidence to suggest that these declining trajectories were related to both within- and between-person sources of variation.

Time-varying covariation models

To identify potential developmental covariates of within-child victimization trajectories, we tested a model that included individual differences in physical aggression and emotional dysregulation as concurrent predictors. The inferential tests of the fixed effects associated with parameter estimates in Equation 6 (reported in Table 3) assess whether the average longitudinal trajectories for aggression and emotional dysregulation covary with the longitudinal trajectories for physical and relational victimization. Consistent with our directional hypotheses, we employed one-tailed probability tests. The significant negative slope coefficients for time reflect significant declines in both physical ($\beta = -0.33, p < .001$) and relational ($\beta = -0.22, p < .01$) victimization over time, independent of the effects of aggression and emotional dysregulation. The slope parameters for aggression were significant for both physical ($\beta = 0.65, p < .001$) and relational ($\beta = 0.56, p < .001$) victimization. Relative to baseline measures of victimization, for every one point increase in aggression (e.g., from *hardly ever* to *sometimes*), there were corresponding increases of 26% (0.65/2.54) and 23% (0.56/2.45) in physical and relational victimization that were independent of the time-based decreases in victimization. The net effect of physical aggression over Grades 1 to 3 nearly doubled physical and relational victimization scores relative to children who were not physically aggressive. The slope parameters for emotional dysregulation were also significant for both physical ($\beta = 0.21, p < .05$) and relational ($\beta = 0.30, p < .01$) victimization. For every unit increase in emotional dysregulation (e.g., from *hardly ever* to *sometimes*), there were corresponding increases in physical and relational victimization of 8% (0.21/2.54) and 12% (0.30/2.45), respectively. The net effect of emotional dysregulation over Grades 1

2. All models were also tested with the physical and relational victimization scores combined into a single measure. Findings were similar and are not reported to reduce redundancy.

Table 1. Psychometric properties and mean levels (standard deviations) of peer victimization, aggression, and emotional dysregulation for girls and boys

Variables	α	Range	Boys (<i>N</i> = 221)	Girls (<i>N</i> = 210)	Total (<i>N</i> = 431)
Physical victimization					
Tb	0.85	0–10	2.65 (2.53)	2.83 (2.55)	2.74 (2.53)
T1	0.84	0–10	2.76 (2.35)	2.57 (2.35)	2.67 (2.35)
T2	0.82	0–9	2.10 (1.99)	2.23 (2.02)	2.16 (2.00)
T3	0.86	0–10	1.87 (1.95)	1.88 (1.94)	1.88 (1.94)
Relational victimization					
Tb	0.85	0–10	2.44 (2.46)	2.95 (2.47) ^a	2.68 (2.48)
T1	0.84	0–10	2.50 (2.43)	2.76 (2.33)	2.63 (2.38)
T2	0.82	0–9	1.92 (1.91)	2.65 (2.26) ^a	2.27 (2.12)
T3	0.86	0–10	2.07 (2.22)	2.27 (2.15)	2.17 (2.19)
Physical aggression					
Tb	0.84	0–3	0.29 (0.54) ^a	0.15 (0.36) ^a	0.22 (0.47)
T1	0.78	0–2.67	0.29 (0.52) ^a	0.15 (0.36) ^a	0.22 (0.46)
T2	0.76	0–2.67	0.32 (0.51) ^a	0.18 (0.31) ^a	0.25 (0.43)
T3	0.79	1–3	0.32 (0.59) ^a	0.21 (0.35) ^a	0.27 (0.48)
Emotional dysregulation					
Tb	0.80	1–3	0.45 (0.54)	0.36 (0.48)	0.40 (0.51)
T1	0.79	0–2.5	0.47 (0.57)	0.39 (0.49)	0.43 (0.53)
T2	0.78	0–2.75	0.52 (0.59) ^a	0.46 (0.45) ^a	0.49 (0.53)
T3	0.78	0–3	0.62 (0.64) ^a	0.51 (0.55) ^a	0.57 (0.60)

Note: Tb, baseline, fall of Grade 1; T1, Time 1, spring of Grade 1; T2, Time 2, spring of Grade 2; T3, Time 3, spring of Grade 3.

^aMean levels differ significantly ($p < .05$) between girls and boys.

to 3 was an attenuation of typical decreases in physical victimization scores (dysregulated children decreased three times more slowly than more regulated children) and relational victimization *increased* by a factor of 1.5 among children who were relatively more emotionally dysregulated compared to children who demonstrated fewer emotional problems.

Moderator models

To identify between-person and between-context moderators in victimization trajectories, we included age at entry into Grade 1, sex, and participation in the WITS victimization prevention program in the Level 2 and 3 models (see Equations 7–10). The Level 1 model for these analyses was as Equation 1. Age at entry into Grade 1 was centered at the sample mean of 6.35 years, and sex and program participation were dummy coded (boys and nonparticipants = 0, girls and program participants = 1). These variables were modeled simultaneously to consider unique contributions of each predictor controlling for the influence of the others.

The results of this analysis are reported in Table 4. Intercept tests of group differences for sex, age, and program participation indicated no significant differences in physical or relational victimization at school entry. The slope coefficient for time was nonsignificant, indicating that victimization scores for boys who were 6.35 years of age at school entry and who did not participate in the WITS program did not decline over the course of the study. Holding the other predic-

tors constant, age at school entry, and sex did not significantly impact trajectories of peer victimization during early elementary school years. The test of WITS program participation, however, indicated that, holding the other predictors constant, victimization scores for program participants declined significantly faster than nonparticipants. Accordingly, an average child who participated in the WITS program exhibited a 24% ($[0.005 + -0.36]/4.08 \times 2.75$) decline in physical and 46% ($[-0.17 + -0.35]/3.08 \times 2.75$) decline in relational victimization between baseline and the end of Grade 3 (Figure 1).

To determine if age at entry to Grade 1, sex, and WITS program participation also moderated the time-varying covariation between victimization and aggression and emotional dysregulation, a combined time-varying covariation and moderator analysis was conducted. The Level 1 model for this analysis was the same as Equation 6. The Level 2 and 3 models were as Equations 7–10. Results from this analysis were substantially equivalent to those already reported. That is, age at entry into Grade 1 and sex were not significant moderators for any of the Level 1 predictors; however, WITS program participation was a significant moderator of the time-based trajectories, but not for changes in aggression or emotional dysregulation.

Discussion

The findings of this study strongly indicate that child and context characteristics affect the continuity of physical and relational victimization in early elementary school. Because of

Table 2. Time-based models: Fixed and random victimization effects as a function of time in study

Physical Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (π_{0i})	2.77	0.17	16.65	16	<.0001
Slope (π_{1i})	-0.31	0.08	3.99	16	<.001
Variance Component	χ^2		df	p	Variance
Random effects					
School-level intercept (u_{00})	0.26	1261.41	16	<.001	3.9%
School-level slope (u_{10})	0.05	773.60	16	<.001	<1%
Individual-level intercept (ε_0)	1.75	1261.41	409	<.001	46.2%
Individual-level slope (ε_1)	0.64	773.60	409	<.001	6.2%
Within-person residual (σ^2)	1.68				42.9%
Relational Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (π_{0i})	2.70	0.16	17.07	16	<.0001
Slope (π_{1i})	-0.19	0.01	2.44	16	<.05
Variance Component	χ^2		df	p	Variance
Random effects					
School-level intercept (u_{00})	0.22	36.48	16	<.01	3.4%
School-level slope (u_{10})	0.05	35.33	16	<.01	<1%
Individual-level intercept (ε_0)	2.82	949.98	394	<.0001	43.5%
Individual-level slope (ε_1)	0.41	619.54	394	<.0001	6.3%
Within-person residual (σ^2)	2.98				46.0%

the similar findings for relational and physical victimization, they are discussed together. In this study, both types of victimization declined from Grade 1 to 3. In contrast to the decline in victimization experienced by children in this study, children who were physically aggressive at school (as rated by teachers) showed net *increases* in victimization over time. Furthermore, children who were emotionally dysregulated at school showed markedly attenuated declines in physical victimization and *increases* in relational victimization. Despite higher mean levels of physical aggression and emotional dysregulation in boys, sex differences did not moderate the rate of decline in victimization. In addition, the decline in victimization was not moderated by age at entry into Grade 1. Finally, whereas children involved in the WITS program showed declines in both relational and physical victimization, nonparticipants showed stable levels of victimization.

Child characteristics as longitudinal covariates

The considerable victimization literature suggests many potential mechanisms that link children's aggression to their continued victimization (Hanish et al., 2004; Ladd, 2006; Schwartz, 2000). Whereas some aggression is used by preschoolers alongside prosocial behaviors to establish status

or dominance (Hawley, 2002), children who do not decrease their aggression engage disciplinary actions of school authorities and frequently become victimized or rejected by their peers who fear they will hurt them or get them into trouble (Ladd, 2006; Leadbeater & Hoglund, 2009). Victims' reactive or retaliatory aggression may sustain the bully-victim relationship (Schwartz, 2000; Venestra et al., 2007). Early behavioral interventions to specifically assist these children to manage their aggressive behaviors show promise in prevent the spiraling problems connected to cycles of aggression and victimization (Weisz & Kazdin, 2010).

In this study, emotional dysregulation also contributed to victimization even after controlling for the effects of aggression. A short-term longitudinal study with preschool children (Miller et al., 2005) demonstrated that, although displays of observed dysregulation were relatively brief, about one-quarter of children showed high levels of dysregulation, and individual differences in dysregulated behavior predicted teacher-rated peer conflict. Similarly, findings of the current study suggest that higher levels of emotional dysregulation on any occasion are associated with higher levels of victimization. Some children show emotional dysregulation because they are more frequently teased for being "babyish" and are provoked by other children, or because they attribute hostile

Table 3. Time-varying covariation models: Fixed and random victimization effects as a function of time in study, aggression, and emotional dysregulation

Physical Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (π_{0i})	2.54	0.16	15.41	16	<.0001
Time slope (π_{1i})	-0.33	0.08	4.34	16	<.001
Aggression slope (π_{2i})	0.65	0.14	4.63	1573	<.001
Dysregulation slope (π_{3i})	0.21	0.11	1.86	1573	<.05
Variance Component			χ^2	df	p
Random effects					
School-level intercept (u_{01})	0.22		36.57	16	<.01
School-level slope (u_{11})	0.05		34.43	16	<.01
Individual-level intercept (ϵ_0)	2.91		988.39	394	<.001
Individual-level slope (ϵ_1)	0.38		618.13	394	<.001
Within-person residual (σ^2)	2.86				
Relational Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (π_{0i})	2.45	0.15	15.64	16	<.0001
Time slope (π_{1i})	-0.22	0.07	2.98	16	<.01
Aggression slope (π_{2i})	0.56	0.15	3.850	1572	<.001
Dysregulation slope (π_{3i})	0.30	0.12	2.58	1572	<.01
Variance Component			χ^2	df	p
Random effects					
School-level intercept (u_{01})	0.18		33.17	16	<.01
School-level slope (u_{11})	0.04		33.12	16	.01
Individual-level intercept (ϵ_0)	2.79		947.54	394	<.001
Individual-level slope (ϵ_1)	0.39		610.16	394	<.001
Within-person residual (σ^2)	2.98				

Note: The tests of fixed effects are one tailed.

intent to peers and react aggressively (Yeung & Leadbeater, 2007). The school context creates the need to modulate aggression and emotions in order to learn, follow changing schedules, obey class rules, and form friendships. Children who have not been successful in these activities by Grade 1 may need individual and sometimes professional and sustained assistance to learn strategies for managing aggression and emotional responses.

Moderators of victimization trajectories

Findings showed expected sex differences in physical aggression and of emotional dysregulation, with boys exhibiting higher mean levels of aggression at each grade and higher dysregulation in Grades 2 and 3. Boys and girls reported similar levels of physical victimization, but girls reported higher levels of relational victimization on two of the four measurement occasions. Despite these differences, sex did not moderate the associations between victimization and any of our predictor vari-

ables (time, physical aggression, and emotional dysregulation). This suggests that although boys may display more aggression and emotional dysregulation, the role of these two factors in sustaining victimization are similar for both boys and girls. This suggestion is consistent with many studies that show sex differences in mean levels of risks or vulnerabilities, but similarities in the pathways leading from risks to psychopathology (e.g., Leadbeater, Kuperminc, Blatt, & Hertzog, 1999). There is little evidence of sex differences in coping with emotional distress, but one observational study (Kyrtziz, 2001) suggests that, even in preschool, boys may develop norms that associate emotions like crying easily and fearfulness with female characteristics and then tease other boys who fail to mask these emotions. Research is needed to assess factors affecting the trajectories of children's efforts to mask frustration, whining, anger, and so forth.

Young age at entry into Grade 1 also did not moderate the decline of physical or relational victimization over time, suggesting that age differences in victimization may be trumped by actual behaviors and experiences in classrooms. Further-

Table 4. Moderator models: Fixed and random effects of between-person and between-school moderators of victimization trajectories

Physical Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (γ_{000})	4.08	2.26	1.81	416	.07
Age (β_{01})	-0.25	0.68	1.53	416	.13
Sex (β_{02})	0.05	0.27	0.20	16	.84
Program (γ_{001})	0.41	0.27	1.53	416	.13
Time slope (γ_{100})	0.005	1.08	0.005	416	.99
Age (β_{11})	-0.014	0.17	0.08	416	.93
Sex (β_{12})	0.0004	0.12	0.003	16	.99
Program (γ_{101})	-0.36	0.12	2.91	416	<.01
Variance Component			χ^2	df	p
Random effects					
School-level intercept (u_{01})	0.41		34.14	16	<.01
School-level slope (u_{11})	0.05		23.61	16	.10
Individual-level intercept (ε_0)	3.07		1022.10	392	<.001
Individual-level slope (ε_1)	0.42		647.17	392	<.001
Within-person residual (σ^2)	2.83				
Relational Victimization					
Parameter	Coefficient	SE	T Ratio	df	p
Fixed effects					
Intercept (γ_{000})	3.08	2.19	1.41	416	.16
Age (β_{01})	-0.14	0.34	0.42	416	.67
Sex (β_{02})	0.49	0.28	1.78	16	.09
Program (γ_{001})	0.41	0.27	1.54	416	.12
Time slope (γ_{100})	-0.17	1.09	0.16	416	.87
Age (β_{11})	0.04	0.17	0.22	416	.83
Sex (β_{12})	-0.03	0.13	0.25	16	.81
Program (γ_{101})	-0.35	0.13	2.70	416	<.01
Variance Component			χ^2	df	p
Random effects					
School-level intercept (u_{01})	0.55		40.10	16	<.01
School-level slope (u_{11})	0.10		33.90	16	.01
School-level intercept (ε_0)	2.68		924.73	392	<.001
School-level slope (ε_1)	0.39		613.52	392	<.001
Within-person residual (σ^2)	2.98				

more, the narrow range of age differences may have attenuated moderating effects. Differences in size in relation to age may be more salient to the bully-victim relationships (Janssen, Craig, Boyce, & Picket, 2004).

Our findings showed that being in a school with the WITS victimization prevention program was the primary factor associated with declines in physical and relational victimization. The findings of the current study concur with previous studies showing the effects of this program on victimization (Leadbeater et al., 2003; Leadbeater & Hoglund, 2006). In variable centered analyses of changes in mean differences over time, children in program schools initially reported slightly more victimization than children in control schools. This was attributed to the en-

couragement they receive to "seek help." In the current study, once sex, age, and school level factors were accounted for, no program differences were observed at baseline.

It is somewhat surprising that the program did not moderate the time-varying impact of physical aggression and emotional dysregulation on victimization; however, such time-varying models are computationally intensive with the statistical power required to assess moderators of the covarying relations between victimization, aggression, and emotional dysregulation somewhat limited in the present study. In contrast, it may be that child characteristics that impact on experiences of victimization are not changed by intervention; that is, aggression and emotional dysregulation are associated with peer victimization whether or not

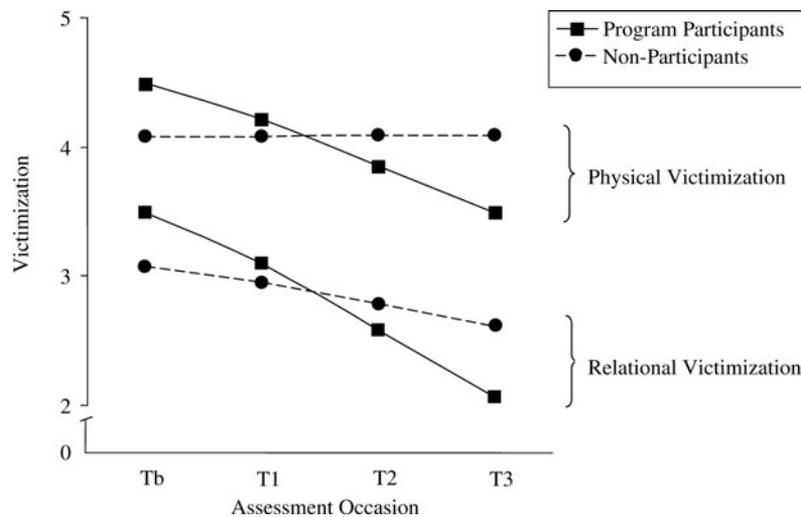


Figure 1. The trajectories of physical and relational victimization for program participants and nonparticipants; Tb, baseline; T1, T2, T3, Times 1–3, respectively.

schools participate in a prevention program. More research is needed on the specific consequences of changes in classroom contexts and school climate on bullying and victimization.

Implications for interventions to prevent victimization

In attempting to keep schools safe, aggressive behaviors in children who are victimized may be dealt with harshly by school authorities who restrict these children's activities or suspend or expel them from school. Yet, repeated aggressive behaviors in young children may reflect their unsuccessful attempts to stop their victimization by peers. If these coping efforts are accompanied by expressions of frustration and anger such as temper tantrums, crying, whining, and other manifestations of emotional dysregulation, children are more likely to increase rather than decrease their vulnerability. Punitive adult responses that do not deal with the peer victimization may add to children's problems by pointing them out as deviant or targets for bullies, increasing the likelihood of peer rejection or isolating them from conventional friendships. Previous findings with this sample also suggest that some aggressive-victimized children, particularly boys, go on to show high levels of internalizing problems, perhaps again as a result of their perceived hopelessness of their efforts to stop the victimization as they are engaged in the cycle of aggression and victimization (Leadbeater & Hoglund, 2009). There are many programs that are effective in enhancing children's social skills (see review by Miller, Brehm, & Whitehouse, 1998), although these do not always serve to reduce bullying and victimization (Smith, Schneider, Smith, & Ananiadou, 2004). It is possible that emotion- and behavior-specific approaches are needed to increase children's competence in managing behaviors that can evoke bullying and to reduce the cycling of aggression and victimization that can result from ineffective strategies for managing peer conflict. Aggression and emotional dysregulation prolong the bullying interac-

tion; walking away and ignoring the bullying may be effective because they create physical distance from the situation and promote help seeking. Moreover, programs that encourage children to stop and think before they act may help insert a protective pause between experiences of victimization and children's responses to them (Giesbrecht, Müller, & Miller, 2010). For children who become chronic victims, adult intervention is essential to their safety and protection at school.

Study Limitations

The similarity of findings for physical and relational victimization in this study suggest that, at least for this age group, the two types of victimization are very similar. Nevertheless, shared method variance may have also inflated the similarities between physical and relational victimization. Moreover, using self-report questionnaires to assess very young children's experiences of victimization may test the upper limits of their understanding, particularly for relational victimization. However, past research supports the assessment of physical and relational victimization using the Social Experiences Questionnaire in young children (Crick et al., 2006; Desjardin, Yeung, Sukhawathanakul, MacDonald, & Leadbeater, 2009) and gives stronger support for the use of self-reports of victimization with very young children compared to peer-report measures (Ladd & Kochenderfer-Ladd, 2002). We are encouraged in our belief that victimization can be assessed in our young sample by the invariance in item factor loadings and moderate stability in victimization across four waves of data (see Leadbeater & Hoglund, 2009).

Teacher ratings of physical aggression also yield only one source of ratings for children's maladjustment, although scores were moderately correlated with parent ratings. Our data are also limited in assessing teacher reports of physical but not relational aggression. The role of relational aggression in sustaining victimization is not known; however, it fre-

quently co-occurs with physical aggression, and it is possible that it contributes to both children's victimization and to the social status of the aggressor (Card et al., 2008). In addition, relationally aggressive children frequently codisplay competent behaviors that may obscure their aggression from school staff (Hawley, 2002), increasing the need to support victimized children who seek help.

Our large longitudinal data set provides a unique opportunity to assess developmental issues related to peer victimization; moreover, the design of the present study itself is a definitive strength (with up to four measurement occasions per child). Despite these strengths, however, there are limitations to the time-varying covariation analysis:

1. These Level 1 variables are measured concurrently, which raises the problem of reciprocal causation: it is possible that increases in peer victimization are responsible for increases in aggression and emotional dysregulation.
2. Assessment of such longitudinal covariation models are computationally intensive and could benefit from additional occasions of measurement.

Future research could address these issues by linking each year's victimization outcomes to prior aggression and emo-

tional dysregulation scores (e.g., dual change score model; McArdle, 2001) and by including additional data points during times when changes in victimization, aggression, and emotional dysregulation are most likely (e.g., soon after entry to each new grade).

Conclusion

The present investigation demonstrates that both child and context characteristics are important for understanding changes in experiences of physical and relational victimization during the early elementary school years. By demonstrating that physical aggression and emotional dysregulation are important longitudinal covariates of victimization, this study also signals the need to understand how interventions aimed at reducing aggression and dysregulation may influence children's experiences of victimization. This study also demonstrates the benefit of changes in the school-level context for reducing levels of relational and physical victimization during the early elementary school years, which is a period of rapid social, emotional, cognitive, and personality development during which intervention and prevention programs may have considerable impact on interrupting peer victimization before it becomes chronic.

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