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Peer Victimization Trajectories From Kindergarten Through High School: Differential Pathways for Children's School Engagement and Achievement?

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This investigation's aims were to map prevalence, normative trends, and patterns of continuity or change in school-based peer victimization throughout formal schooling (i.e., Grades K–12), and determine whether specific victimization patterns (i.e., differential trajectories) were associated with children's academic performance. A sample of 383 children (193 girls) was followed from kindergarten ($M_{\text{age}} = 5.50$) through Grade 12 ($M_{\text{age}} = 17.89$), and measures of peer victimization, school engagement, academic self-perceptions, and achievement were repeatedly administered across this epoch. Although it was the norm for victimization prevalence and frequency to decline across formal schooling, 5 trajectory subtypes were identified, capturing differences in victimization frequency and continuity (i.e., high-chronic, moderate-emerging, early victims, low victims, and nonvictims). Consistent with a chronic stress hypothesis, high-chronic victimization consistently was related to lower—and often prolonged—disparities in school engagement, academic self-perceptions, and academic achievement. For other victimization subtypes, movement into victimization (i.e., moderate-emerging) was associated with lower or declining scores on academic indicators, and movement out of victimization (i.e., early victims) with higher or increasing scores on these indicators (i.e., “recovery”). Findings provide a more complete account of the overall prevalence, stability, and developmental course of school-based peer victimization than has been reported to date.

Keywords: peer victimization, trajectories of peer victimization, peer relations, school engagement, achievement

Introduction

Bullying and peer victimization in educational settings has become a national public concern in part because youth who are victimized by schoolmates—particularly across multiple school years (Troop-Gordon & Ladd, 2005)—evidence a plethora of psycho-social and scholastic adjustment problems (see Ettekal, Kochenderfer-Ladd, & Ladd, 2015; Nakamoto & Schwartz, 2010). Peer victimization has been defined as being bullied or aggressed upon repeatedly and over time by one or more students (Juvonen & Graham, 2014; Olweus, 1999), and has been operationalized by

assessing how frequently youth are the recipients of peers' aggressive acts (e.g., see Ladd & Kochenderfer-Ladd, 2002).

The link between peer victimization and academic performance has been examined less thoroughly than its association with other aspects of development, such as child health and psychological adjustment (see Ettekal et al., 2015). Even though research on peer victimization in school contexts is ongoing and has been a source of important discoveries (see Juvonen & Graham, 2014), insight into this phenomenon and its links with children's academic development could be enhanced if investigative attention were focused on three pivotal objectives. First, a more complete descriptive account is needed of the prevalence, stability, and developmental course of peer victimization across the entire period of formal schooling. At present, and as detailed more completely below, more is known about some intervals of schooling (e.g., Grades K–5; 7–8) than others (e.g., Grades 9–12). A broader, more accurate picture of these dimensions could therefore be obtained by mapping both the prevalence and normative (mean) levels of peer victimization in Grades K–12. Second, more needs to be known about intraindividual differences in the continuity or discontinuity of peer victimization across all of the formal school years. We know that some children are victimized earlier versus later in their schools careers, and for longer versus shorter periods of time (reviewed below), but no attempt has been made to determine whether there are specific classes of children who exhibit stable versus increasing or decreasing victimization trajectories from Grades K through 12. Third, along with differences in

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the temporal patterning of victimization, there is a need to understand how differences in victimization trajectories are associated with children's academic performance across the formal school years.

Accordingly, this investigation's specific aims were to (a) map prevalence and normative trends in peer victimization across the entire period of formal schooling, (b) identify patterns of continuity or discontinuity (i.e., distinct victimization trajectory classes) across Grades K through 12, and (c) determine the extent to which specific trajectory classes (i.e., differential victimization trajectories) are associated with aspects of children's academic performance over the course of their entire school careers. The latter two aims were examined in the context of factors (e.g., gender, SES, race, school transition timing) that, logically, might be related to the identification of trajectory classes and their associations with children's academic adjustment.

Prevalence and Normative Trends

Prevalence denotes the proportion of persons in a given population that possess a particular characteristic or malady. Although prevalence estimates for peer victimization vary, and some periods of schooling have been investigated more than others, evidence suggests that the occurrence of peer victimization varies by age or grade level. For example, extant findings imply that victimization tends to be more widespread in earlier as opposed to later years of schooling (Nylund, Bellmore, Nishina, & Graham, 2007; Reavis, Keane, & Calkins, 2010; Rudolph, Troop-Gordon, Hessel, & Schmidt, 2011). These findings have led some to conclude that victimization likely "peaks" during middle school (e.g., Nylund et al., 2007). Prevalence also has been reported to vary by gender, but evidence of this difference often has been mixed and substantiation weak. Some have found that more boys than girls are victimized (e.g., Snyder et al., 2003; Sullivan et al., 2006; Wolke et al., 2001), particularly when bullying is perpetrated directly or physically rather than indirectly or relationally (e.g., Delfabbro et al., 2006; Paquette & Underwood, 1999; Storch et al., 2003). Others have found that more girls than boys are victimized (e.g., Seals & Young, 2003). In general, gender differences in prevalence tend not to be statistically robust.

Differential Victimization Trajectories

The question of whether there are distinct classes or subtypes of children who exhibit stable, increasing, or decreasing patterns of victimization across time has been investigated, but not across the entire period of formal schooling. Those who have addressed this question have done so using concurrent, cross-sectional, and short-term longitudinal designs—that is, by gathering data at the beginning and end of multiyear intervals (e.g., 5th and 8th grades; Scholte, Engles, Overbeek, de Kemp, & Haselager, 2007), or at regular intervals (repeatedly) across two to four contiguous grades (e.g., K–3rd grades, Kochenderfer-Ladd & Wardrop, 2001; 2nd–5th grades, Rudolph et al., 2011; 3rd–5th grades, Biggs et al., 2010; 5th–7th grades, Goldbaum, Craig, Pepler, & Connolly, 2003). Accordingly, the current state of knowledge about classes of children who traverse differing (i.e., stable, increasing, or decreasing) victimization

trajectories across grades is limited in the sense that more is known about some intervals of schooling (e.g., Grades K–5; 7–8) than others (e.g., Grades 9–12).

In fact, when specific periods of schooling have been examined, the types of trajectory classes identified differ. Across mid to late grade school (i.e., Grades 3–6), investigators have identified between 3 and 5 trajectory subtypes. Boivin, Petitclerc, Feng, and Barker (2010) followed children from Grade 3 through 6 and identified three distinct trajectories: rarely victimized (low-stable; 85.5% of sample; 49% boys), victimized and increasing (moderate-increasing; 10% of sample; 69% boys), and highly victimized and declining (high-decreasing; 4.5% of sample; 54.5% boys). Boys significantly outnumbered girls only in the moderate-increasing group. Biggs et al. (2010), in contrast, tracked children across nearly the same grade levels (Grades 3–5) and found five victimization trajectory groups: low (56.2%), moderate (31.7%), decreasing (5.9%), increasing (4.0%), and chronic (2.1%). Gender distributions were not reported, but gender by subtype analyses revealed no significant sex differences.

With adolescents, followed from late grade school into the middle school, investigators have identified 3 to 4 trajectory subtypes. After gathering data across Grades 5 through 7, Goldbaum et al. (2003) identified four trajectory groups that they labeled nonvictims (low; 88%; 50% males), desisters (high-decreasing; 6%; 58% males), late onset (low-increasing; 5%; 59% males), and stable victims (consistently high; 1%; 60% males). The proportion of males versus females within each group did not differ statistically. In comparison, using data collected online rather than in schools, Sumter, Baumgartner, Valkenburg, and Peter (2012) identified three victimization subtypes with adolescents who were followed from ages 12 to 17. The identified trajectory classes were labeled low (48%), moderate (45%), and high (6%), and all subtypes evidenced declines in victimization over time. Boys and girls were "almost equally represented" in the low and moderate subtypes, but fewer boys (39%) were in the high group.

Thus, at present, research on trajectory classes paints an inconsistent picture of developmental trends. Comparisons across studies are made difficult because trajectory classes have been mapped using different data sources (e.g., self vs. peer reports) and different schooling intervals (i.e., periods of schooling, grades within periods). However, one empirically supported inference is that whereas some youth are seldom abused by peers, others are chronically victimized, and still others experience discontinuities such as progressively increasing or decreasing peer victimization. Other seemingly defensible inferences are that (a) there is a greater propensity for peer victimization to decline (both normatively and by subtypes) rather than increase as youth progress through school, and (b) when increasing trajectory classes are identified, these subtypes occur during earlier rather than later periods of schooling.

Significant gender differences in trajectory class membership appear rare, and when reported, do not follow a consistent pattern. With grade-schoolers, Boivin et al. (2010) found more boys than girls in a moderate-increasing trajectory class, but Biggs et al. (2010) found no gender differences for groups characterized by moderate or increasing victimization. With adolescents, Sumter et al. (2012), found more girls than boys in a high victimization

subtype, but Goldbaum et al. (2003) found no such difference for highly victimized youth.

Associations Among Victimization Trajectories and Academic Performance

When victimization's association with academics has been investigated, achievement has been targeted more often than other indicators of educational performance or adjustment. A meta-analysis of existing evidence (e.g., Nakamoto & Schwartz, 2010) suggests that there is a small but significant negative association between victimization and children's achievement.

The absence of a strong relation between victimization and achievement is perhaps understandable because the determinants (e.g., intelligence, parent education, SES) of scholastic attainment (e.g., summative indicators such as grades, achievement test scores, etc.) are diverse, and some may be more influential than peer maltreatment. Furthermore, when viewed from the perspective that victimization precedes scholastic difficulties (currently, the most corroborated model; see Nakamoto & Schwartz, 2010; Schwartz, Gorman, Nakamoto, & Toblin, 2005), it can be argued that achievement may not be the most proximal or sensitive indicator of victimization's academic consequences. Rather, victimization may be more closely linked with other formative aspects of children's educational experience, including the feelings, motivations, and behaviors they develop toward school (e.g., facets of school engagement), and the perceptions they develop of their academic abilities (i.e., perceived academic competence).

Moreover, it is conceivable that exposure to victimization in school may be particularly disruptive during the foundational periods, such as the grade school years, when children are first formulating and eventually solidifying their school-related attitudes, motivations, perceptions, and behaviors (see Ladd & Dinella, 2009; Ladd, Buhs, & Seid, 2000; Ladd, Herald-Brown, & Reiser, 2008). If so, then it would be expected that victimization, particularly when chronic, would evidence stronger relations with school engagement during earlier rather than later school years.

School engagement. Three forms of school engagement have been linked with learning and achievement: cognitive, behavioral, and emotional (see Fredricks, Blumenfeld, & Paris, 2004; Ladd, Herald-Brown, & Kochel, 2009). Whereas cognitive engagement has been construed as students' level of processing or intellectual effort during learning tasks, behavioral engagement refers to actions such as taking initiative, participating cooperatively, manifesting effort and persistence, adopting classroom norms, and staying out of trouble (Birch & Ladd, 1997; Buhs & Ladd, 2001; Finn, 1989). Emotional engagement has been defined as students' attitudes or sentiments toward school and has been operationalized in terms of children's feelings about peers, teachers, schoolwork, or their overall affective reactions to school (Ladd et al., 2000; Skinner, Wellborn, & Connell, 1990).

Although arguably important, the association between peer victimization and school engagement has been understudied. This is unfortunate because a substantial case can be made for victimization as a determinant of school disengagement. In particular, the experiences engendered in victimization (e.g., punishing interactions, physical harm, embarrassment) may decrease emotional engagement by causing children to develop negative school-related attitudes (i.e., dislike of school) and motivations (i.e.,

desiring or seeking to avoid school). Support for this hypothesis includes evidence indicating that young victimized children, as compared to their nonvictimized counterparts, display lower school liking and higher school avoidance (e.g., Buhs, Ladd, & Herald, 2006; Kochenderfer & Ladd, 1996). Unfortunately, evidence that speaks to these relations largely is limited to the early school years.

Peer victimization also may undermine children's behavioral engagement in classrooms. In particular, this type of maltreatment may discourage independent participation, or children's propensity to initiate and actively participate in classroom activities. Independent participation has been hypothesized to be a contributor to classroom learning and achievement (see Finn, 1989, 1993; Fredricks et al., 2004; Ladd et al., 2000), and evidence corroborates this premise (see Buhs & Ladd, 2001; Buhs et al., 2006; Finn, 1989; Ladd, Birch, & Buhs, 1999).

Academic self-perceptions. Peer victimization also may color children's perceptions of their academic competence. Compared to nonvictimized children, those who are victimized may be less likely to receive peer support, including classmates' affirmation for their academic skills and accomplishments. These children, moreover, may often receive negative messages from peers about their academic competence or worth as learning companions (e.g., teased about schoolwork; disparaged during peer-mediated learning activities; etc.). Although this hypothesis has not been well investigated, the available evidence is consistent with expectation. In a concurrent study conducted with sixth graders, Thijs and Verkuyten (2008) found that peer victimization and perceived academic competence were negatively correlated. More remains to be learned about victimization's association with children's sense of their academic competence.

Overview of Investigative Aims and Hypotheses

To address this study's three specific aims, participants were followed from grades kindergarten through Grade 12. Repeated assessments were made of children's peer victimization, school engagement, academic self-perceptions, and achievement.

Aim 1: Profile prevalence and normative trends in peer victimization across Grades K–12. Previously reported prevalence trends, even though estimated across limited periods of schooling, led us to hypothesize that declines would be evident in peer victimization levels—both sample-wide and by gender—across the K to 12 school years. Although normative declines in victimization were expected for both genders, past findings led us to expect that—if reliable sex differences were detected—boys would have higher levels of peer victimization than girls (e.g., there would be gender differences in the intercepts but not the slopes of children's normative victimization trajectories). Because no one has profiled normative trends across the entirety of formal schooling, it was specifically of interest to pinpoint the time(s) at which, during the course of children's school careers, normative fluctuations occur in peer victimization.

Aim 2: Examine intraindividual differences in temporal patterns and identify distinct victimization trajectory classes across Grades K through 12. Although investigators have yet to map victimization trajectories across more than a few grade levels, corroboration among previously documented patterns led us to hypothesize that at least three types of trajectory classes would

be identified, including *nonvictims* (i.e., low-stable; Biggs et al., 2010; Boivin et al., 2010; Goldbaum et al., 2003; Sumter et al., 2012) and *high-chronic* victims (or high-decreasing; see Boivin et al., 2010; Goldbaum et al., 2003; Sumter et al., 2012). A high-decreasing rather than a high-stable trajectory was anticipated because this pattern was documented by investigators who utilized the longest follow-through designs (Boivin et al., 2010; Sumter et al., 2012), and, normatively, it was expected that victimization levels would decline across grades. A *moderate* victimization trajectory was also expected because some form of this pattern has been documented in all of the previous longitudinal investigations. However, no hypotheses were made about the direction of this trajectory because findings for this subtype have been inconsistent across studies (i.e., variously reported as stable, increasing, and decreasing). Whether or not an *increasing* victimization trajectory would be identified was treated as an empirical question because this pattern has emerged only sporadically, and in different forms (e.g., low increasing; moderate increasing). Gender differences in trajectory group membership were not anticipated, given that such findings have been rare or inconsistent.

Aim 3: Probe the links among victimization trajectories and academic performance across Grades K–12. Expectations about these linkages were based on the above-articulated rationales and the overarching hypothesis that victimization impedes children's academic engagement, perceptions, and performance. When examined by trajectory classes, academic differences were expected to conform to a chronic stress hypothesis—that is, be largest (most discrepant) between children in trajectories indicative of higher (i.e., magnitude) and longer (i.e., chronicity) victimization patterns (e.g., high-chronic/decreasing subtype) than those who exhibited static, nonoccurring patterns of victimization (i.e., nonvictims, or low-stable subtype). Accordingly, when contrasted with nonvictims, academic engagement, perceptions, and achievement scores were expected to be largely discrepant (significantly lower) for the high-chronic subtype, and moderately discrepant (but still significantly lower) for moderate subtypes.

In the event that declining victimization trajectory subtypes were identified, two potential effect patterns were envisioned. The first was consistent with a “recovery” hypothesis (see Kochenderfer & Ladd, 1996), which postulates that, as victimization diminishes (i.e., children approach nonvictim status), so do the processes (stressors) that inhibit academic performance, which in turn enables children to academically reengage, develop more positive views of their academic competence, and achieve in school. Recovery of this type, however, would not be anticipated for subtypes where declines were not large enough to eradicate children's victimization experiences (e.g., eliminate exposure to stress processes). The second was based on a “scar” hypothesis (see Kochel, Ladd, & Rudolph, 2012; Rohde, Lewinsohn, & Seeley, 1990), which implies that victimization's stress- and coping-related effects endure beyond its cessation and, thus, continue to impede children's school engagement and achievement.

If increasing victimization trajectory classes were identified, it was expected that such subtypes would evidence significantly lower or decreasing patterns of school engagement, perceived academic competence, and achievement. Logically, increasing vic-

timization trajectories signify the exacerbation of maltreatment and its effects (e.g., stress).

Method

Participants

Participants were 383 children (193 girls and 190 boys) who were recruited into a longitudinal study as they entered kindergarten ($M_{\text{age}} = 5.50$) and followed yearly until Grade 12 ($M_{\text{age}} = 17.89$). IRB approval was obtained at the study's inception and renewed in all subsequent years. School district consent was obtained prior to recruitment, and 95% of parents provided written informed consent for their child's participation. Approximately 81% of children made the transition to middle or junior high school, and 19% remained in the same school from K to Grade 8. Approximately 77.8% of children were Caucasian, 17.8% African American, and 4.4% Hispanic, biracial, and other backgrounds. About 24.5% came from families with low annual incomes (\$0–\$20,000), 36.8% had low to middle incomes (\$20,001–\$50,000), and 38.7% had middle to high incomes (over \$50,001).

Procedure

A repeated-measures, multi-informant design was utilized, and all measures were administered in the spring of the school year. From Grades K to 12, children provided self-report data about peer victimization and school engagement (i.e., school liking, avoidance) and, beginning in Grade 4, reported about their perceived academic competence. Trained project examiners administered measures in counterbalanced order individually (Grades K–5) or in groups using self-paced questionnaire booklets (Grades 6–12). Examiners provided instructions about how to complete each measure, and encouraged children to report about contemporaneous events, circumstances, perceptions, and so forth. Examiners also individually administered standardized reading and math tests from Grade 2 to Grade 12. From Grades K to 12, teachers (K–5: the classroom teacher; 6–12: a subject-area teacher) rated each child's classroom engagement.

The analyses performed in this study utilized peer victimization data that were collected on a yearly basis and academic adjustment indicators that were assessed every other year. Although many of the academic indicators were assessed yearly, specifying growth models with 13 waves of data led to estimation problems in some of the models. Thus, to reduce model complexity and maintain consistency across criteria, scores from every other year (e.g., K and Grades 2, 4, 6, 8, 10 and 12, when available) were used for the academic indicators. Demographic information was collected from parents at the outset of the study.

Measures

Child reports of peer victimization were obtained using a previously validated measure. Multiple facets of children's school-related engagement, self-perceptions, and achievement were assessed using established child- and teacher-report instruments. For all study variables, descriptive (range, means, *SDs*.) and reliability (alphas) statistics are reported in Table 1.

Table 1

Descriptive Statistics (Range, Observed Means, and Standard Deviations) and Scale Reliabilities for Peer Victimization and Academic Adjustment Variables (N = 383)

Grade	n	Min	Max	M	SD	α	Grade	n	Min	Max	M	SD	α
Peer victimization							Academic competence						
K	382	1.00	5.00	2.24	1.15	.75	4	372	1.00	4.00	3.00	.77	.70
1	383	1.00	5.00	2.26	1.07	.73	6	364	1.00	4.00	3.16	.68	.73
2	382	1.00	5.00	2.17	1.04	.77	8	350	1.00	4.00	3.20	.68	.81
3	381	1.00	5.00	2.08	1.00	.74	10	287	1.00	4.00	3.06	.68	.83
4	370	1.00	5.00	1.95	.91	.80	12	276	1.00	4.00	3.12	.67	.83
5	371	1.00	5.00	1.89	.84	.80	Independent participation						
6	364	1.00	4.50	1.99	.82	.70	K	383	1.00	3.00	2.37	.63	.89
7	362	1.00	5.00	1.59	.82	.86	2	382	1.00	3.00	2.33	.64	.89
8	349	1.00	5.00	1.45	.71	.86	4	361	1.00	3.00	2.38	.50	.73
9	306	1.00	4.00	1.38	.61	.83	6	346	1.00	3.00	2.34	.61	.86
10	287	1.00	4.50	1.37	.62	.82	8	329	1.00	3.00	2.25	.65	.88
11	296	1.00	3.75	1.26	.50	.79	10	233	1.00	3.00	2.29	.61	.84
12	276	1.00	5.00	1.31	.56	.80	12	225	1.00	3.00	2.32	.54	.82
School liking							Math performance						
K	383	1.00	5.00	4.17	1.14	.87	2	383	46.00	155.00	96.26	12.61	—
2	383	1.00	5.00	4.19	.98	.85	4	370	48.00	144.00	100.22	12.74	—
4	372	1.00	5.00	3.37	1.07	.87	6	369	56.00	153.00	100.22	16.33	—
6	368	1.00	5.00	3.31	.97	.88	8	335	63.00	137.00	101.81	14.76	—
8	349	1.00	5.00	3.26	1.04	.89	10	282	60.00	135.00	99.02	14.58	—
10	287	1.00	5.00	3.12	.99	.90	12	274	61.00	130.00	97.92	13.91	—
12	276	1.00	5.00	3.14	.98	.91	Reading performance						
School avoidance							2	382	47.00	140.00	103.31	14.33	—
K	383	1.00	5.00	2.77	1.44	.71	4	371	58.00	144.00	103.35	14.06	—
2	383	1.00	5.00	2.42	1.31	.76	6	370	57.00	144.00	103.03	14.72	—
4	372	1.00	5.00	2.60	1.15	.77	8	336	57.00	139.00	104.57	14.42	—
6	368	1.00	5.00	2.70	1.08	.77	10	273	64.00	131.00	104.99	12.61	—
8	349	1.00	5.00	2.49	1.09	.81	12	268	63.00	128.00	106.72	13.93	—
10	287	1.00	5.00	2.49	1.05	.80							
12	276	1.00	5.00	2.48	1.10	.81							

Peer victimization. Self-reports of victimization best suited this investigation's aims and longitudinal design. In contrast to peer or teacher reports, self-reports have the advantage of providing (a) frequency rather than consensus data, (b) greater rater consistency across grades, (c) scores that are more sensitive to changes in victimization and less affected by reputational biases, and (d) data that reflect children's experiences across multiple school contexts (e.g., classroom, bus, lunchrooms, schoolyard; see Furlong et al., 2010; Olweus, 2010).

Children completed a four-item peer victimization scale (Kochenderfer & Ladd, 1996) to assess the frequency (1 = *almost never*, 2 = *a little*, 3 = *sometimes*, 4 = *a lot*, and 5 = *almost always*) with which they had experienced physical ("Does anyone in your class ever hit you at school?"), verbal ("Does anyone in your class ever say mean things to you at school?"), relational ("Does anyone in your class ever say bad things about you to other kids at school?"), and general victimization ("Does anyone in your class ever pick on you at school?"). Scores were calculated by averaging ratings across the four items at each grade level (α = .73 to .86).

Confirmatory factor analysis (CFA) was used to assess measurement invariance. Longitudinal measurement models were specified such that peer victimization indicators at each of the 13 waves (K–12) were used as the observed indicators and loaded onto latent factors representing peer victimization over time. First, configural invariance was assessed by specifying a baseline model

in which factor loadings and intercepts were unconstrained. This model had adequate model fit ($\chi^2 = 1665.53$, $df = 1130$, $p < .001$; RMSEA = .04; SRMR = .05; CFI = .93). Second, weak measurement invariance was assessed by specifying a model in which factor loadings for similar items were constrained to be equal over time. This model had adequate model fit ($\chi^2 = 1780.52$, $df = 1166$, $p < .001$; RMSEA = .04; SRMR = .06; CFI = .92). Third, strong factorial invariance was assessed by specifying a model in which the factor loadings and intercepts of similar items were constrained to be equal over time. This model appeared to have inadequate model fit based on several fit indices ($\chi^2 = 2282.57$, $df = 1214$, $p < .001$; RMSEA = .05; SRMR = .14; CFI = .86).

Nested model comparisons were used to contrast these models. Because difference tests based on χ^2 are sensitive to sample size, contrasts were conducted for multiple fit indices (see Cheung & Rensvold, 2002). When testing for weak measurement invariance, although the nested model comparisons based on the χ^2 were statistically significant ($\Delta\chi^2 = 114.99$, $df = 36$, $p < .001$), differences among the other fit indices were trivial (Δ RMSEA < .01, Δ SRMR < .01, Δ CFI = -.01). Cheung and Rensvold (2002) recommend that a difference score of -.01 or less on the CFI can be used as a cutoff for retaining the more parsimonious model.

Thus, it appeared that weak measurement invariance was a reasonable assumption, indicating that the nature of peer victimization remained stable over time. Nested model comparisons indicated that imposing strong measurement invariance resulted in

a significant decline in model fit ($\Delta\chi^2 = 502.05$, $df = 48$, $p < .001$, $\Delta RMSEA = .01$, $\Delta SRMR = .08$, $\Delta CFI = -.06$). Within a longitudinal measurement invariance test, the lack of strong invariance indicated mean-level changes in the peer victimization indicators over time. Although this invariance test does not indicate exactly how mean-level changes were occurring over time, by using latent growth modeling to assess normative trends in peer victimization from K-12, it was possible to more concisely ascertain the nature of these mean-level changes.

Prevalence was calculated as the proportion of children sampled at each grade, from K to 12, who had victimization scores high enough to be considered "victimized." To examine prevalence by victimization frequency, two classification criteria were created that were referenced against item scaling: moderate (i.e., children with scores between 2.00 and 3.50) and severe (i.e., children with scores above 3.50). Scores of 2.00 were for children who, averaging over the four forms of victimization, indicated that they had experienced victimization "a little." Scores greater than 3.50 were for children who indicated that at least two of the four forms of victimization happened to them "a lot."

School engagement. Assessed aspects of school engagement included emotional (i.e., child-reported school liking/disliking), motivational (i.e., child-reported school avoidance), and behavioral (i.e., teacher reports of classroom independent participation) components. A 7-item version of the School Liking and Avoidance Questionnaire (Ladd, 1990; Ladd & Price, 1987) was used to assess emotional (i.e., school liking; 4 items) and motivational (school avoidance; 3 items) aspects of school engagement. Children rated each item using a 5-point scale (1 = *almost never*, 2 = *a little*, 3 = *sometimes*, 4 = *a lot* and 5 = *almost always*). Example school liking items included "Are you happy at school?" and "Do you like being in school?" School avoidance items included "Do you wish you did not have to go to school?" and "Do you ask your parents to let you stay home from school?"

CFA was used to determine whether items from the school liking and avoidance subscales assessed distinct dimensions of school engagement (i.e., school liking and avoidance). For each of seven data waves (Grades K, 2, 4, 6, 8, 10 and 12), a 1-factor model (combining all school liking and avoidance items) was compared to a 2-factor model (school liking and avoidance items specified as correlated factors). For all waves, the 2-factor model had adequate model fit ($RMSEAs < .08$; $SRMRs < .04$; $CFIs > .98$) and fit the data better than the 1-factor model ($RMSEAs = .13-.22$; $SRMRs = .05-.10$; $CFIs = .83-.93$). Accordingly, in subsequent analyses, school liking and school avoidance were examined as distinct constructs. Subscale scores were created by averaging ratings across component items.

The Independent Participation (4 items) subscale of the Teacher Rating Scale of School Adjustment (see Birch & Ladd, 1997; Ladd, Kochenderfer, & Coleman, 1996) was used to assess children's behavioral classroom engagement. Example items include "shows initiative" and "works independently," and teachers rated each item on a 3-point scale (1 = *doesn't apply*, 2 = *applies sometimes*, and 3 = *certainly applies*). Seven waves of participation data were utilized (Grades K, 2, 4, 6, 8, 10 and 12), and scores for this measure exhibited adequate reliability.

Perceived academic competence. Children's self-perceptions in the academic domain were evaluated with a 4-item child-report version of the widely used and validated Perceived Academic

Competence subscale of the Perceived Competence Scale for Children (Harter, 1982). Each item is presented using a structured alternative response format (e.g., "Some kids feel like they are very good at their schoolwork . . . but other kids worry about whether they can do the schoolwork assigned to them."). Children are instructed to choose the alternative that is more like them, and then rate whether that response is "*sort of true*" or "*really true*" for them. Item responses are scored on a 4-point scale (1–4) and then averaged such that higher scores denote greater perceived academic competence. Five waves of academic competence data were used in this study (Grades 4, 6, 8, 10, and 12) and, for each wave, scale reliability was adequate.

Academic achievement. Reading and math achievement were assessed using corresponding subscales of the Wide Range Achievement Test (WRAT; Wilkinson, 1993). WRAT subscale items are scored as incorrect or correct (scores = 0, 1). The WRAT is suitable for children in Grades 2–12, has adequate psychometric properties, and has been normed and validated on national samples (Hughes, 1987; Wilkinson, 1993). For each wave, standard scores for reading and math were computed for each participant using the scale developer's scoring procedures. WRAT scores from Grades 2, 4, 6, 8, 10 and 12 were utilized.

Data Analysis Plan

First, multiple-group latent growth modeling (Mplus; Muthén & Muthén, 1998–2010) was performed to assess normative trends in peer victimization from kindergarten to Grade 12 and to determine whether these trends varied by gender. Second, growth mixture modeling (GMM) was performed to identify classes of children with similar victimization trajectories from K to 12. Third, study hypotheses were evaluated by examining time-varying differences in academic performance for children in different victimization class trajectories, with the nonvictim subtype serving as a referent group. For each academic indicator, growth models were used to contrast patterns of continuity or change among victim trajectory classes, and premises about potential effect patterns (i.e., temporal differences consistent with recovery, scar, or developmental hypotheses) were evaluated by comparing linear growth models with piecewise growth models (via nested model comparisons). To reduce the complexity of the latent growth models, and keep the models consistent across criteria, scores from every other year (e.g., K and Grades 2, 4, 6, 8, 10 and 12, when available) were used for the academic indicators.

Results

Missing Data Analyses

Examination of missing data and participant attrition revealed that, for all study variables, 12.1% of the data were missing. Attrition increased with time (0% in Grade 2, 1.0% in Grade 4, 0.8% in Grade 6, 3.7% in Grade 8, 7.8% in Grade 10, and 9.9% in Grade 12). In all, by Grade 12, 23.2% of participants had dropped out. A series of univariate *t* tests were performed to examine the associations between children's gender, race, and socioeconomic status (e.g., family income) and the likelihood of having either missing data on a specific measure or dropping out of the study. Results showed that boys were more likely than girls to drop out;

however, there were no differences by race or family income. Moreover, boys, African Americans, and children with lower family incomes were more likely to have missing data on self-report measures, but not teacher reports, in Grades 10 and 12, but these differences were small in magnitude.

Missing data were handled in Mplus using full information maximum likelihood (FIML) estimation. This approach is advantageous compared to more traditional missing data techniques because it includes all participants in the analyses ($n = 383$) regardless of whether they had missing data or dropped out of the study (Enders, 2010). In order for FIML to provide accurate and unbiased parameter estimates, observable causes of missingness should be included within the specified models. Therefore, in addition to examining gender and middle school transition effects, race and SES were included in the growth models. When possible, race and SES were specified as auxiliary variables using the *auxiliary* command in Mplus (which uses a *saturated correlates* model; see Enders, 2010). However, this command cannot be used in mixture models (Muthén & Muthén, 1998–2010), in which case they were specified as covariates in the GMMs. Although the addition of covariates in a GMM may impact the identification of classes (see Muthén, 2004), the peer victimization trajectory classes that were identified were nearly identical when comparing models with and without covariates.

Prevalence of Peer Victimization

The proportions of children sampled at each grade who had scores that fit the criteria for moderate (2.00 to 3.50) and severe (>3.50) victimization are shown in Table 2. Children were categorized as low-victims if their peer victimization scores were less than 2.00. Whether estimated as moderate or severe, prevalence rates for peer victimization declined across grades.

Normative Trends in Peer Victimization by Gender

Normative trends in peer victimization were assessed from Grades K to 12 using a series of multiple-group latent growth models that were designed to assess gender differences in time-varying changes in peer victimization. Fit for all growth models

was deemed adequate if $RMSEA < .06$ and $SRMR < .08$ (Hu & Bentler, 1999). Because software packages use an inappropriate baseline model to compute the CFI in growth curve models (Wu, West, & Taylor, 2009), this index was not interpreted for these models.

A model-building strategy was used such that a multiple-group *linear* growth model was first specified that included latent intercept and slope factors to capture linear changes in peer victimization from kindergarten to Grade 12. This model did not appear to have adequate model fit ($RMSEA = .09$; $SRMR = .11$). To assess possible sources of misfit, residual variances and observed means were examined, and a nonlinear latent growth model was specified that included a quadratic effect to capture nonlinear changes in peer victimization over time. This model did not have adequate fit ($RMSEA = .08$; $SRMR = .10$). A cubic growth factor was added to the latent growth model; this model had adequate fit ($RMSEA = .06$; $SRMR = .08$) and more accurately estimated the observed peer victimization scores than previous models.

To determine whether there were gender differences in normative trends in peer victimization from kindergarten to Grade 12, nested model tests (i.e., Likelihood Ratio Tests; LRTs) were performed. Toward this end, the unconstrained model in which the latent growth (i.e., intercept, slope, quadratic and cubic) factors were estimated for each group (log likelihood = 5033.61) was compared to a constrained model in which constraints were added to make these factors equal for girls and boys (log likelihood = 5039.65). The LRT indicated that constraining these factors between genders resulted in a statistically significant reduction in model fit ($-2*\Delta LL = 12.08$, $\Delta df = 4$, $p = .02$). Follow-up nested model comparisons indicated that gender differences were primarily attributable to intercept differences between boys and girls (log likelihood = -5034.27 ; $-2*\Delta LL = 1.31$, $\Delta df = 3$, $p = .73$ with unconstrained model and $-2*\Delta LL = 10.77$, $\Delta df = 1$, $p = .01$ with constrained model). Thus, although boys appeared to have significantly higher levels of peer victimization than girls (i.e., intercept differences; $M = 2.17$ for girls and $M = 2.31$ for boys), the patterns of change over time between girls and boys were similar (for girls and boys: $M_{slope} = .25$, $M_{quadratic} = -2.64$, $M_{cubic} = 1.50$; see Figure 1).

Differential Victimization Trajectories

To identify groups of children with heterogeneous peer victimization trajectories from kindergarten to Grade 12, a series of growth mixture models (i.e., 2- thru 6-classes) were specified using the 13 (yearly) waves of peer victimization data. Models included intercept, slope, and quadratic latent growth factors. Several criteria were used to determine the optimal solution, and for each model, multiple fit indices were evaluated in addition to examining whether the trajectory classes appeared substantively and conceptually meaningful (Ram & Grimm, 2009; Tofighi & Enders, 2008). A combination of multiple information criteria (i.e., AIC, BIC, and sample-size adjusted BIC referred to as SABIC), the likelihood ratio test (i.e., Lo-Mendell-Rubin likelihood ratio test; LMR-LRT), and classification accuracy were used to assess each model. Models with smaller AIC, BIC, and SABIC values indicate better solutions. A significant p value on the LMR-LRT indicates that a model with k classes has better fit to the observed data than a model with $k-1$ classes. Classification accuracy was

Table 2

Victimization Prevalence Rates by Grade

Grade	Low victims	Moderate victims	Severe victims
K	41.1	38.0	20.9
1	39.7	41.5	18.8
2	42.1	42.1	15.7
3	42.0	45.4	12.6
4	56.5	33.8	9.7
5	60.6	33.7	5.7
6	50.5	44.5	4.9
7	75.1	21.3	3.6
8	82.2	14.9	2.9
9	83.7	15.4	1.0
10	86.1	12.2	1.7
11	91.2	7.8	1.0
12	88.8	10.5	.7

Note. Low victims ≤ 2 . Moderate victims from 2 to 3.5. Severe victims ≥ 3.5 .

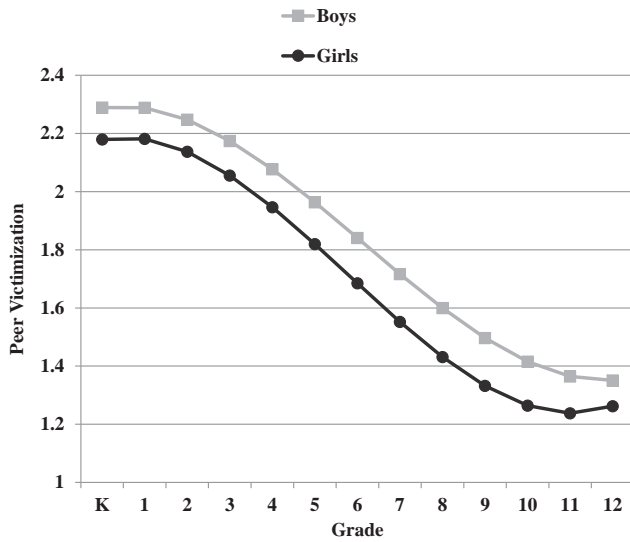


Figure 1. Predicted normative trends in peer victimization from kindergarten to Grade 12 by gender.

assessed by examining the entropy and class assignment probabilities for each model (values closer to 1 indicate more precise classification).

Based on these criteria, the 5-class model appeared to be the optimal solution (see Table 3 and Figure 2). This model had the smallest BIC, second smallest AIC and SABIC, high entropy, and average class assignment probabilities, and the LMR-LRT approached statistical significance ($p = .08$). Although the 6-class solution had the smallest AIC and SABIC, the addition of a sixth class did not improve model fit compared to the 5-class solution ($2 * \Delta LL = 42.8, p = .14$), and the additional class identified in this model was not conceptually distinguishable from the classes identified in the 5-class solution. The 5-class solution (see Figure 2) consisted of 24.0% of children in a high-declining peer victimization trajectory class (labeled *high-chronic victims*), 25.8% in a high steeply declining trajectory class (labeled *early victims*), 17.8% in a moderate increasing victimization trajectory class (labeled *moderate-emerging victims*), 25.8% in a moderate declining victimization class (labeled *low victims*), and 6.5% in a very low victimization trajectory class (labeled *nonvictims*). After determining the optimal model, covariate effects were assessed. High-

chronic and moderate-emerging victims were significantly more likely ($ps < .01$) to be boys than nonvictims (65% and 64%, respectively). Making the transition to middle school was not associated with victimization class membership. Nonetheless, in subsequent growth models assessing academic adjustment trajectories, gender and middle-school transition were specified as covariates.

Differential Victimization Trajectories and Academic Adjustment Trajectories

To examine the associations between children's peer victimization trajectories and their academic adjustment trajectories, separate latent growth models were estimated for each of the academic indicators. Peer victimization trajectory class assignments were used to compute a series of dummy coded variables that were then regressed on the latent intercept and slope academic factors. Because both the low and nonvictims trajectory groups appeared to have relatively low levels of peer victimization and the nonvictims group was smaller than other groups, these two groups were combined to increase the size of the referent group in subsequent analyses (referred to as the *low victims* group hereafter).

To explore whether there were developmental differences between the early (K–6) and later grades (6–12), and to provide a more nuanced assessment of the chronic, recovery, and scar hypotheses, for each academic indicator a piecewise growth model was compared to a linear growth model using nested model comparisons. Piecewise models included two latent slope factors and one intercept factor. To test for differences by victimization trajectory classes within the piecewise models, three regression effects were estimated for each class. One effect estimated differences in children's academic trajectories (slopes) from baseline assessment to Grade 6, the second effect estimated slope differences from Grades 6 to 12, and the third effect estimated intercept differences. For each academic adjustment indicator, models were specified twice by adjusting the intercept to estimate differences in children's baseline and Grade 12 academic adjustment. If developmental differences between the early and later grades were pronounced, then it would be expected that there would be significant differences between the two slope factors and between the victimization class regression effects. If these differences were nonsignificant, then a more parsimonious linear growth model was used.

Table 3
Model Fit Indices and Class Proportions for Peer Victimization Trajectories

Model	LogL	AIC	BIC	SABIC	Entropy	LMR-LRT	Percent of children in each class (and average class assignment probabilities)					
							1	2	3	4	5	6
2-Class	–6433.16	12908.32	12991.23	12924.60	.87	937.38**	59.0 (.97)	41.0 (.95)	—	—	—	—
3-Class	–6303.60	12665.20	12779.69	12687.68	.81	251.65**	34.7 (.93)	30.0 (.88)	35.3 (.94)	—	—	—
4-Class	–6209.94	12493.89	12639.97	12522.57	.83	180.06**	34.5 (.92)	24.5 (.87)	34.2 (.91)	6.8 (.96)	—	—
5-Class	–6171.31	12432.63	12610.29	12467.51	.79	72.92	24.0 (.91)	25.8 (.88)	17.8 (.78)	25.8 (.86)	6.5 (.93)	—
6-Class	–6148.38	12402.77	12612.01	12443.85	.78	42.8	23.0 (.87)	27.2 (.87)	13.1 (.78)	23.0 (.83)	7.8 (.85)	6.0 (.94)

Note. LogL = Loglikelihood; AIC = Akaike information criteria; BIC = Bayesian information criteria; SABIC = Sample-size adjusted Bayesian information criteria; LMR-LRT = Lo-Mendell-Rubin likelihood ratio test.
** $p < .01$.

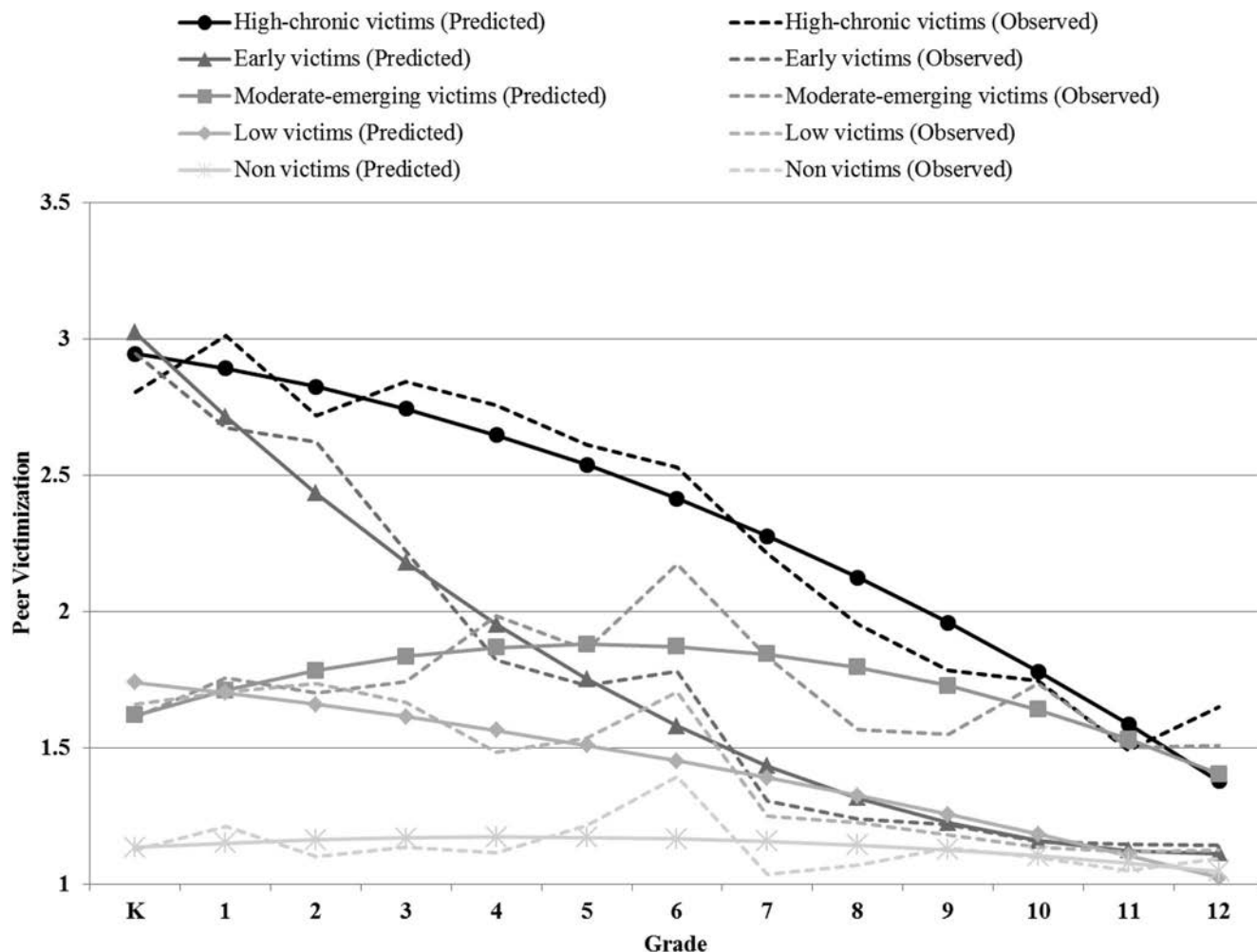


Figure 2. Children's predicted and observed peer victimization trajectories from kindergarten to Grade 12 based on 5-class solution consisting of *high-chronic victims* (24.0%), *early victims* (25.8%), *moderate-emerging victims* (17.8%), *low victims* (25.8%), and *nonvictims* (6.5%).

In addition to examining the effects of children's peer victimization trajectories, these models also accounted for gender differences and whether or not children made the transition to middle school. Gender and middle school transition were specified as covariate (main) effects and regressed on the latent intercept and slope factors. A series of models were also estimated to test for gender by victimization class interaction effects. These interaction effects were consistently nonsignificant and did not improve model fit. Thus, these interaction effects are not reported here, and more parsimonious models are presented without interaction effects. Results (i.e., estimates and significance tests) for these models are presented in Table 4 and illustrated (for interpretative purposes) in Figure 3. Notably, although many of the trajectories illustrated in Figure 3 appeared to be different from one another, suggestive of subtype differences, these differences should be assessed with consideration of the significance tests reported in Table 4 to account for the variability (standard errors) in these estimated trajectories.

School engagement. The conditional piecewise growth model for school liking had adequate fit ($\chi^2 = 120.89$, $df = 38$, $p < .001$;

RMSEA = .08; SRMR = .05). Furthermore, a nested model comparison ($\Delta\chi^2 = 120.89$, $df = 8$, $p < .001$) revealed that the piecewise model had better fit compared to a linear growth model ($\chi^2 = 196.13$, $df = 46$, $p < .001$; RMSEA = .09; SRMR = .07). This model revealed a developmental pattern in which children's school liking trajectories were highest in kindergarten and exhibited a steep decline through the grade school years (i.e., Grade 6); however, these trajectories appeared to level off and become more stable in middle and high school (i.e., Grades 6 to 12; see Figure 3 top left). Controlling for gender and the middle school transition, the results indicated that early victims had significantly lower rates of school liking in kindergarten compared to the reference group (i.e., low victims; $M_{intercept} = 4.42$). However, by Grade 12, high-chronic victims had lower rates of school liking, and the effect for early victims was attenuated. Although there were no significant slope effects (i.e., differences) between victimization classes, the results revealed a decline in school liking for low-victims during the early grade school years ($M_{slope} = -.33$, $p < .001$). In addition to the victimization effects, boys had a more significant decline in school liking during the early grade school

Table 4

Estimates for Conditional Growth Models Examining Children's Academic Adjustment Trajectories by Peer Victimization Trajectory Class

Predictors	School liking		School avoidance		Independent participation		Perceived academic competence		Math performance		Reading performance	
	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>
Baseline Effects												
Moderate-emerging	.03	.15	-.09	.19	-.30***	.08	-.16	.10	-2.36	1.79	-5.35**	2.09
Early	-.31*	.13	.63***	.17	-.12	.07	-.08	.09	1.20	1.57	-1.42	1.84
High-chronic	-.24	.14	.26	.17	-.37***	.07	-.49***	.09	-4.54**	1.63	-7.64***	1.91
Gender	.02	.10	.11	.13	-.15**	.06	.12	.07	-2.14	1.23	-1.78	1.44
M.S. transition	-.04	.13	.14	.16	-.08	.07	.08	.08	3.40*	1.57	-2.27	1.80
Grade 12 Effects												
Moderate-emerging	-.20	.17	.12	.18	-.21*	.08	-.32**	.11	-5.80*	2.29	-3.36	2.15
Early	-.17	.14	-.09	.15	-.05	.07	-.07	.09	-1.46	1.98	-.79	1.83
High-chronic	-.32*	.16	.40*	.17	-.35***	.08	-.41***	.10	-7.09***	2.11	-2.91	1.96
Gender	-.22	.11	.11	.12	-.19***	.06	.03	.07	-.20	1.57	.51	1.46
M.S. transition	-.13	.14	.10	.16	-.13	.07	-.03	.09	-4.85*	1.98	-4.68**	1.82
Slope Effects (K-6)												
Moderate-emerging	-.09	.06	.07	.08	.01	.02	-.04	.03	-2.47*	1.10	.15	.79
Early	.06	.06	-.20**	.07	.01	.02	.00	.03	-2.23*	.97	-.23	.69
High-chronic	-.03	.06	-.07	.07	.00	.02	.02	.03	-2.44*	1.01	1.24	.72
Gender	-.10*	.04	.07	.05	-.01	.01	-.02	.02	-.10	.76	.41	.54
M.S. transition	-.02	.06	-.04	.07	-.01	.02	-.03	.03	-2.05*	.96	1.34*	.68
Slope Effects (G6-G12)												
Moderate-emerging	.01	.06	.00	.08	.01	.02	-.04	.03	.50	.58	.56	.61
Early	-.01	.06	-.04	.07	.01	.02	.00	.03	.60	.49	.36	.51
High-chronic	.00	.06	.12	.07	.00	.02	.02	.03	.77	.54	.75	.56
Gender	.02	.04	-.07	.05	-.01	.01	-.02	.02	.71	.40	.49	.41
M.S. transition	-.01	.06	.03	.07	-.01	.02	-.03	.03	-1.39**	.50	-1.70***	.51

Note. For gender, 0 = female, 1 = male; M.S. = middle school; G = grade. For all growth models, the low victim trajectory class served as the reference group.

* $p < .05$. ** $p < .01$. *** $p < .001$.

years than girls and subsequently lower levels of school liking by Grade 12. Making the middle school transition was not associated with students' school liking trajectories.

The conditional piecewise growth model for school avoidance had adequate model fit ($\chi^2 = 84.31$, $df = 38$, $p < .001$; RMSEA = .06; SRMR = .04; see Figure 3 top middle). Furthermore, a nested model comparison ($\Delta\chi^2 = 16.57$, $df = 8$, $p = .03$) revealed that the piecewise model had better fit compared to a linear growth model ($\chi^2 = 100.88$, $df = 46$, $p < .001$; RMSEA = .06; SRMR = .05). Compared to low victims ($M_{intercept} = 2.41$), early victims had significantly higher rates of school avoidance in kindergarten; however, they also had a significant decline in school avoidance during the early schooling years (i.e., K-6) and were not significantly different from low victims by Grade 12. By Grade 12, high-chronic victims had significantly higher school avoidance than low victims.

The conditional piecewise growth model for independent participation resulted in estimation problems, but the linear growth model had adequate model fit ($\chi^2 = 84.12$, $df = 44$, $p < .001$; RMSEA = .05; SRMR = .07; see Figure 3 top right). Compared to low victims ($M_{intercept} = 2.56$), moderate-emerging and high-chronic victims had significantly lower levels of independent participation in kindergarten, which were sustained until Grade 12. In addition to the victimization effects, boys consistently had lower levels of independent participation.

Perceived academic competence. In contrast to the other academic indicators, the baseline assessment for perceived aca-

ademic competence was not collected until Grade 4. For this reason, a linear rather than a piecewise growth model was used to assess slope differences in children's trajectories from Grades 4 to 12. This model had adequate fit ($\chi^2 = 55.56$, $df = 24$, $p < .001$; RMSEA = .06; SRMR = .06; see Figure 3, bottom left). In Grade 4, compared to low victims ($M_{intercept} = 3.25$), high-chronic victims had lower academic competence, and this effect was sustained until Grade 12. Although significant slope effects were absent, by Grade 12 the moderate-emerging victims also had significantly lower academic competence than low-victims.

Academic achievement. Conditional latent growth models were also estimated to assess children's math and reading performance from Grades 2 to 12. The piecewise model for math performance resulted in adequate fit ($\chi^2 = 81.56$, $df = 27$, $p < .001$; RMSEA = .07; SRMR = .04). Moreover, compared to a linear growth model ($\chi^2 = 213.34$, $df = 35$, $p < .001$; RMSEA = .12; SRMR = .08), the piecewise model exhibited better fit ($\Delta\chi^2 = 131.78$, $df = 8$, $p < .001$). The piecewise model (see Figure 3, bottom middle) revealed a developmental pattern in which children's math performance trajectories increased from Grades 2 through 6, and then declined thereafter. Compared to low victims ($M_{intercept} = 98.0$), high-chronic victims had significantly lower math performance in Grade 2 that was sustained until Grade 12, despite this normative change in scores over time. Moreover, by Grade 12, the moderate-emerging victims also had significantly lower math performance than low victims. Compared to low victims who had a significant increase in math performance from

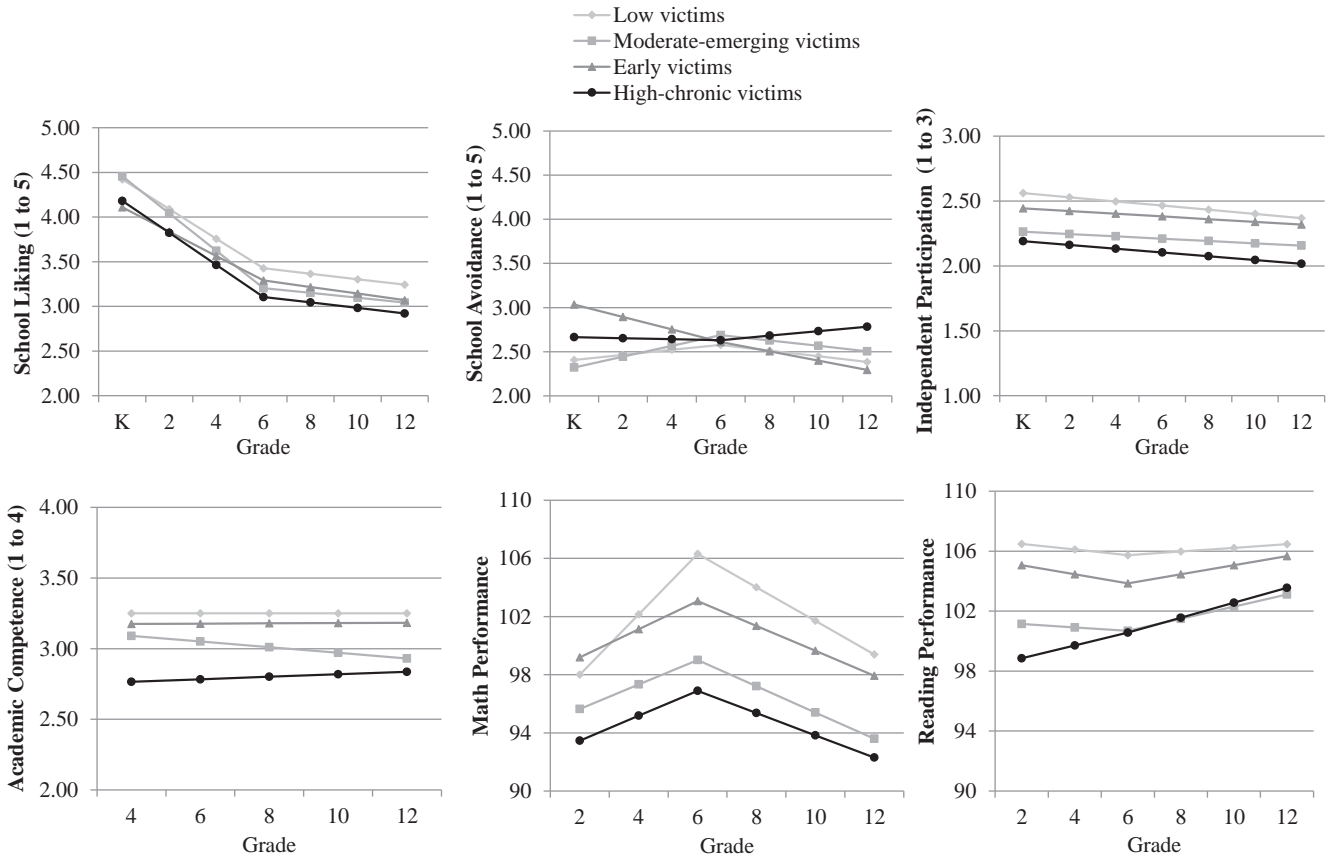


Figure 3. Children's predicted academic trajectories by victimization classes.

Grades 2 to 6 ($M_{slope} = 4.16, p < .001$), all three victims groups (early, moderate-emerging, and high-chronic) were found to have significantly less pronounced gains in math performance during these grades. A middle-school transition effect also was detected, such that children who made the transition showed more significant declines in their performance over time and had lower math performance by Grade 12.

The conditional piecewise growth model for reading performance had adequate model fit ($\chi^2 = 48.55, df = 27, p < .01$; RMSEA = .05; SRMR = .02). Moreover, compared to a linear growth model ($\chi^2 = 70.27, df = 35, p < .001$; RMSEA = .05; SRMR = .05), the piecewise model exhibited better fit ($\Delta\chi^2 = 21.72, df = 8, p < .01$; see Figure 3 bottom right). In Grade 2, compared to low victims ($M_{intercept} = 106.50$), the moderate-emerging and high-chronic victims had significantly lower reading performance, but these effects were attenuated by Grade 12. Children who made the middle-school transition showed more significant declines in their performance in subsequent years and had lower reading performance by Grade 12.

Discussion

The results of this study make three important contributions to what is known about peer victimization in educational settings. First, the data provide a more complete descriptive account of the overall prevalence, stability, and developmental course of peer

victimization across the entire period of formal schooling (i.e., the K–12 school years)—a substantially longer epoch than has been investigated to date. Second, the findings not only corroborate prior research by suggesting that there are multiple subtypes of children who are more or less victimized (i.e., within-sample subtypes), but also extend past evidence by providing a more complete picture of the temporal patterning of victimization (i.e., trajectories throughout formal schooling) for children who are members of specific classes (i.e., subtype trajectories). Third, because multiple indicators of academic performance were examined from Grades K to 12, this study's findings provide novel insights into the long-term associations between specific victimization trajectories, achievement, and focal achievement precursors.

Peer Victimization: Prevalence, Normative Trends, and Differential Trajectories From Grades K to 12

Prevalence and normative trends. Our estimations of victimization's prevalence were consistent with prior investigators' conclusions about age-related or temporal changes (see Nylund et al., 2007; Reavis et al., 2010; Rudolph et al., 2011). First, the proportion of victims identified differed significantly by age or grade level. Second, the prevalence of victimization was higher in earlier as opposed to later school years. Unlike prior findings, however, which have been limited to specific intervals of school-

ing (e.g., Grades K–5; 7–8) and conflicting in their characterization of developmental trends, data from this study suggest that prevalence rates undergo a continuous reduction in magnitude across the entire span of formal schooling. Third, although boys on average appeared to experience somewhat higher levels of victimization than girls, the normative trends for both genders were nearly identical.

At present, there is little basis for understanding why normative estimations of the prevalence of peer victimization show a progressive decline across the school years, as found here. Methodological explanations are conceivable, such as the premise that the observed decline in prevalence is an artifact of self-report assessment (e.g., younger children are more willing to report victimization; children may relax their definitions of peer aggression as they mature, etc.). However, evidence attesting to this instrument's measurement invariance and validity (Ladd & Kochenderfer-Ladd 2002) argue against the credibility of these interpretations.

Alternatively, if prevalence does decline progressively across grades, as our findings and others suggest, then it becomes important to understand its determinants. Unfortunately, as of yet, no theory speaks to developmental vicissitudes in peer victimization. However, in the search for explanations, various maturational and socialization processes deserve consideration, including those that likely decrease children's involvement in bullying and other forms of peer aggression. These include changes in children's maturity (e.g., growth in moral reasoning, perspective taking, empathy, etc.), social environments (e.g., movement toward selective peer environments, peer niche seeking at later grade levels), and socialization processes (e.g., increasing sanctions against bullying and aggression).

Differential trajectories. Not only do our findings suggest that, normatively, the prevalence of peer victimization declines across formal school years, but for the sample as a whole, the results show that frequency—as reflected in average victimization scores—does as well. However, the latter normative trend was not representative of all children's victimization experiences. Rather, substantial intraindividual differences were found in the frequency and continuity of children's peer victimization trajectories across the K–12 school years.

Each of the five victimization trajectories we identified was consistent with expectations or previously reported findings. As hypothesized, two of these subtypes contained participants who were nearly opposites: children who were rarely victimized (i.e., nonvictims), and children who were severely and chronically victimized (i.e., chronic victims; e.g., Biggs et al., 2010; Boivin et al., 2010; Sumter et al., 2012). The third group, termed “early victims” (initially high followed by a steep, continuous decline), had what prior investigators have labeled “rapidly decreasing” or “desister” trajectories (e.g., Biggs et al., 2010; Goldbaum et al., 2003). Of the two moderately victimized subtypes, the low group had a trajectory similar to that reported by Sumter et al. (2012; i.e., “moderate-decreasing”), and the moderate-emerging group followed a course similar to one reported by Goldbaum et al., 2003 (i.e., “late-onset”). Compared to past studies, however, the subtypes identified in this study are significant because, rather than describing trajectories across a few grade levels or isolated schooling epochs, as has been typical, these subtypes characterize victimization experiences that transcend children's entire school careers.

These patterns in the continuity of peer victimization in educational settings present educators with both bad news and good news. First the bad news: Sadly, the discovery of a high-decreasing or chronic victim subtype suggests that, for a substantial number of children (24% of our sample), moderate to severe peer victimization is a stable or enduring part of their educational experience throughout formal schooling. Although the frequency of victimization for children in this subtype declined across grades, as was the norm, it nonetheless remained as high as (and most often higher than) the levels documented for children in all other subtypes. Another piece of bad news was the pattern found for the moderate-emerging victim subtype (17.8% of our sample). These children started school with moderate victimization levels, but their exposure to peer aggression did not decline, as was the norm for all other children, but *increased* across the late elementary and middle school years before diminishing to the level observed for chronic victims. It might be argued that this data pattern lends support to the claim that victimization “peaks” during the transition to middle school (e.g., Nylund et al., 2007). However, the fact that this trajectory was evident in a small proportion of the sample and not characteristic of most children implies that there may only be a subset of children for whom this conclusion applies. For most children, there seems to be a normative decline in victimization throughout this period.

The good news is that we also found groups of children who, although victimized at moderate to high levels as they began school (i.e., early, low subtypes), essentially “recovered” as they moved through the grades. By the time these children reached high school, their average victimization scores were similar to nonvictims. These two groups warrant further investigative attention because understanding what drives desistance could have important implications for prevention and intervention research. Unfortunately, the design of this study precluded opportunities to determine what might account for the desistance exhibited by children in these trajectory subtypes. One hypothesis that merits consideration in future studies is that the children who are represented within these subtypes (i.e., “desisters”) possess certain psychological or social resources that allow them to overcome early victimization experiences (e.g., more friendships, social competence, adaptive coping responses, etc.).

Victimization Trajectories and Academic Performance Across Grades K–12

This study's results corroborate the inverse relation between peer victimization and children's academic performance that has been reported previously (see Nakamoto & Schwartz, 2010). Furthermore, the findings extend what is known by clarifying how each of the identified, long-term victimization patterns is related to *specific* aspects of school engagement and achievement.

School engagement. Particular victimization trajectories were found to be associated with all of the investigated aspects of school engagement. School liking was an indicator of children's emotional engagement toward school. Normatively, these feelings became less positive over the course of formal schooling—a trend that is consistent with evidence (see Ladd et al., 2000) suggesting that liking begins high because children initially underestimate the demands of schoolwork, but declines

as they develop more realistic feelings toward school. Differences by gender were found in that boys' school liking declined at a significantly faster rate than did girls' during elementary school, and by the end of formal schooling, boys' levels of school liking were significantly lower than girls'.

School liking was also linked with specific victimization trajectories. At the start of school, the children who liked school least were those who reported the highest levels of victimization. Early victims had the lowest levels of school liking in kindergarten and, as a group, differed significantly from their counterparts in the low group. For children in the high-chronic group, school liking began low (although not significantly so, relative to the low group) and, unlike children in the early group, remained low throughout their school careers. By Grade 12, the high-chronic group's school liking scores were significantly lower than the low group. These findings are consistent with the view that children's dislike of school is partially rooted in painful peer experiences in that context, and that these experiences can take a lasting toll on children's emotional engagement. Support was also found, however, for the recovery hypothesis in that, by Grade 12, school liking did not differ significantly for early versus low victims.

School avoidance was conceptualized as an indicator of children's motivation to evade the school context. Low to modest levels of school avoidance were exhibited by most students across time with the exceptions of chronic and early victims. Moreover, support was found for both the chronic stress hypothesis and recovery hypothesis. Specifically, consistent with a chronic stress hypothesis, school avoidance increased for high-chronic victims to the point that, by Grade 12, it was significantly higher than levels exhibited by low victims. Consistent with the recovery hypothesis, for early victims, school avoidance tendencies decreased to levels similar to low victims, reflecting reduced risk for peer victimization.

In kindergarten, however, it was the early victim group and not the chronic victim group that manifested significantly higher levels of school avoidance relative to low victims. This finding was unexpected because, at this point in their schooling, children in both groups were reporting similar levels of victimization. This discrepancy might be attributable to factors that were not assessed in this study (e.g., between group differences in child temperament, behavior, family circumstances) and raises the possibility that children who are destined to escape victimization differ in important ways from those that are not. Data from this study suggests that early victims were academically more prepared and engaged in kindergarten than were chronic victims. Such children, because of their greater investment in school (i.e., higher engagement, achievement), may have had stronger initial reactions to victimization (i.e., higher avoidance responses), but greater resources for overcoming victimization and its effects in the long run.

Independent participation indexed children's propensity to take initiative toward classroom activities. Girls exhibited higher levels of this form of behavioral engagement relative to boys, and, normatively, modest albeit nonsignificant declines in independent participation occurred across the course of formal schooling. When examined by trajectory groups, this aspect of school engagement was significantly lower for the high-chronic and moderate emerging subtypes. Specifically, compared to low

victims, children in the high-chronic and moderate-emerging victimization groups not only had significantly lower levels of independent participation in kindergarten, but also retained these positions throughout their school careers.

Although lower independent participation in kindergarten was hypothesized for the high-chronic group, this difference was not expected for the moderate-emerging subtype until later grades (i.e., paralleling the pattern of increasing victimization). Thus, it was surprising that this group's participation trajectory during the early grades—a period during which its members reported only moderate victimization—resembled that of the chronic group. This finding raises the possibility that low classroom participation may be not only a consequence of victimization, but also an initial risk factor. That is, children in the moderate emerging group may have differed from their chronic counterparts in ways that made them not only less engaged in school but also more vulnerable to victimization as they matured. Such a profile, for example, might be manifested by passive or withdrawn children. Children with these propensities are likely to have persistent difficulties with classroom participation, and evidence suggests that their risk for peer victimization increases as they approach preadolescence (Younger, Gentile, & Burgess, 1993). Of course, these interpretations are speculative, and further research is needed to understand why some children's risk for victimization increases as they progress through school.

Academic self-perceptions. Support was found for the hypothesis that victimized children tend to have lower estimations of their academic competence. High-chronic victims' estimates of their academic competence were significantly lower than those of low victims beginning in kindergarten and remained this way across their entire school careers. Children who became more victimized over time (i.e., moderate-emerging victims) were not inclined to see themselves as less academically competent in kindergarten, but did so by Grade 12, consistent with chronic stress perspectives. These results support the view that victimized children are less likely than their nonvictimized counterparts to receive support (e.g., peer affirmation) or have peer-mediated classroom experiences that contribute to their sense of academic competence.

Achievement. Findings were consistent with the conclusion that peer victimization is associated with lower achievement (Nakamoto & Schwartz, 2010). However, evidence from this investigation provides a more comprehensive analysis of the temporal patterning of this relation across the formal school years, and implies that the strength of this association varies not only with victimization trajectories, but also by type of achievement.

For math achievement, the norm was for standard scores to rise during the grade- and middle-school years and then decline during high school. However, the rates and levels of this facet of achievement varied significantly by trajectory subtypes. Two principal patterns of association merit consideration. First, the evidence lent support to the view that any form of peer victimization disrupts children's mathematics achievement, particularly during earlier or foundational years of schooling. For children in all three victimization subtypes (early, moderate-emerging, and high-chronic), growth in math achievement from Grades 2 through 6 was significantly slower than the rate

observed for low victims. Second, the lowest levels of mathematics achievement were linked with chronic and emergent (increasing) victimization patterns. Consistent with the chronic stress hypothesis, children in the high-chronic subtype had math achievement that was significantly lower than low victims, and this difference was apparent from the beginning to the end of formal schooling. Those whose victimization began at moderate levels but increased over time had significantly lower math achievement by Grade 12.

Standard scores for reading exhibited, on the norm, more continuity across grades than did math scores and, when contrasted for victimization subtypes, stronger differences at earlier rather than later grades. As with math achievement, membership in the chronic and emergent (increasing) victimization subtypes was associated with significantly lower reading achievement in Grade 2 (compared to low victims). However, in contrast to math achievement, the children in these groups no longer differed from their low-victim counterparts at Grade 12. This was the only instance in which chronic victimization was not associated with lasting academic difficulties.

Limitations and Future Directions

Several limitations of past research were addressed in this study by mapping peer victimization's prevalence and normative (mean) trends, trajectory subtypes (classes), and academic linkages across the entire period of formal schooling. These strengths, however, were accompanied by certain limitations that should be considered in the context of the study's findings. First, the sampled school environments, particularly those incorporating transitions from self-contained classrooms (primary schools) to school environments where students attend classes with different teachers and students (middle and secondary schools), could have influenced the identified victimization trajectory subtypes and their academic associations. Although such influences were not in evidence (e.g., accounting for transition timing in analyses failed to support this premise), it remains important to ascertain whether the reported findings generalize to other types of school or cultural contexts. Second, although findings were consistent with the premise that peer victimization drives academic maladjustment, other hypotheses (e.g., academic difficulties engender victimization) merit consideration and should be evaluated in future studies. Third, although the cited advantages of self-report methods led us to utilize this strategy for select focal constructs, the use of additional methods, including multimethod assessment strategies, would strengthen future work. Fourth, it is possible that attrition during the later years of this study (i.e., high school) might have made some findings more representative or reliable for girls than for boys. However, by accounting for gender differences in each model, this was unlikely.

Summary and Conclusions

At the broadest level, the results imply that not only is peer victimization negatively associated with achievement, but it is also inversely related to several forms of academic engagement and self-perceptions, all of which have been established as achievement precursors. As a potential determinant, it is con-

ceivable that peer victimization's toll on children's achievement stems from its capacity to undermine children's school engagement. These interconnections, and potential mediated relations, warrant further investigative attention.

Support for the hypothesis that victimization is especially disruptive during the foundational period (K–5) was found for mathematics but not reading achievement. During Grades 2 through 6, membership in any of the victimization subtypes (early, moderate-emerging, and high-chronic) was associated with lesser growth in mathematics, relative to low victims. These findings raise the possibility that early mathematics learning, more so than reading, is hindered by peer victimization. If this supposition receives additional support (e.g., replication), then the processes that underlie such a relation merit explication. Victimization's role in disrupting early math achievement might, for example, be mediated through its effects on children's emotions (e.g., dysregulation due to anger, anxiety), mental states (e.g., poor concentration, reduced ability to perform mental manipulations), or school engagement (e.g., excessive absences).

The findings also help to clarify how specific, long-term victimization patterns are associated with children's school engagement and achievement. Consistent with a chronic stress hypothesis, severe and enduring victimization, best exemplified by the high-chronic trajectory subtype, was often related to lower—and typically prolonged—disparities in school engagement, academic self-perceptions, and achievement. In large part, results for the other victimization subtypes showed that, when children became more victimized over time, they tended to exhibit lower or declining scores on these same academic indicators, and when they became less victimized over time (i.e., early victims), they exhibited higher or increasing scores on these indicators (i.e., data suggestive of “recovery”). Overall, these findings support—but do not confirm—a victimization-as-cause perspective (Nakamoto & Schwartz, 2010; Schwartz et al., 2005) in which it is argued that academic debilities are partially rooted in painful experiences that schoolmates perpetrate on children.

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