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Personal and Familial Predictors of Peer Victimization Trajectories

From Primary to Secondary School

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Abstract

Using a sample of 767 children (403 girls, 364 boys), this study aimed to 1) identify groups with distinct trajectories of peer victimization over a six-year period from primary school through the transition to secondary school, and 2) examine the associated personal (i.e., aggression or internalizing problems) and familial (family status, SES, the parent-child relationship) predictors. Peer victimization was assessed via self-reports from grades 4 through 9 (ages 10 through 15 years), aggression and internalizing problems were assessed in grade 4 via peer nominations, and the parent-child relationship was assessed in grade 7 (i.e., right after the transition to secondary school) via parent-reports. Growth Mixture modeling revealed one group (62%) who experienced little victimization in primary school and even less in secondary school, another group (31%) who was victimized in primary but not or much less in secondary school, and a third group (7%) who was chronically victimized across in both school contexts. Boys were more likely than girls to follow any elevated victimization trajectory. Chronic victimization across primary and secondary school was predicted by non-intact family status and a combination of both internalizing problems and aggression compared to non-victimized youth. In contrast, transitory victimization during primary but not in secondary school was predicted by aggression, but not internalizing problems. Support as well as conflict in the parent-child relationship also showed significant, albeit distinct associations with the different peer victimization trajectories.

Keywords: peer victimization, trajectories, aggression, internalizing problems, parent-child relationship

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From Primary to Secondary School

Peer victimization carries significant risks for victims' later developmental adjustment.

Victimized youth often show increased aggression, anxiety and depression symptoms in response to their suffering, in addition to impaired physical health and school-related difficulties (Brendgen et al., 2013; Vaillancourt, Brittain, McDougall, & Duku, 2013). In light of these nefarious consequences, researchers have deployed considerable efforts to understand why some children become the target of peer harassment. However, most studies have been limited to predicting changes in victimization from one point in time to another. Although informative, this approach fails to consider individual variations in long-term trends of peer victimization. Distinguishing between chronically victimized youth and others for whom peer victimization is a more transitory experience is crucial if we are to gain a clear picture of the predictors of peer harassment. Arguably of specific relevance are inter-individual differences in the course of peer victimization over the transition from primary to secondary school (Paul & Cillessen, 2003). This period not only entails a change in peer context but also coincides with considerable normative changes on the physical, cognitive, emotional, and behavioral level. Youth who are consistently victimized across these different school contexts may differ in important ways from those who are bullied only in primary school. To address this issue, the present study examined the additive and interactive role of individuals' personal (aggression and internalizing problems) and familial (warmth/support and conflict in the parent-child relationship) characteristics in predicting their trajectories of peer victimization from primary to secondary school.

Trajectories of Peer Victimization from Primary to Secondary School

Longitudinal studies suggest that, on average, peer victimization decreases over the course of primary school and into mid-adolescence (Reavis, Keane, & Calkins, 2010; Shell, Gazelle, & Faldowski, 2014; Troop-Gordon & Ladd, 2005). However, there is also considerable variability in the

duration and developmental timing of peer victimization experiences. For instance, Scholte and colleagues (Scholte, Engels, Overbeek, Kemp, & Haselager, 2007) used a cut-off of 1 SD of a continuous victimization scale to distinguish between victims and non-victims during two time points (i.e., at age 11 in primary school and age 14 in secondary school). They found 80% non-victims, 7 % primary school-only victims, 7% secondary school-only victims, and 6% chronic victims. Similar groups, albeit with somewhat different percentages, were identified by Bowes and colleagues (Bowes et al., 2013) using a categorical measure of mother and self-reported peer victimization during two time points (i.e., at age 10 in primary school and age 12 in secondary school). These authors found that 61% of youth were never or only occasionally victimized, 20% were victimized mostly in primary school, 10% were victimized mostly in secondary school and 14% were chronically victimized.

Several studies have also aimed to identify distinct longitudinal trajectories of peer victimization using growth-mixture modeling. Whereas some focused exclusively on the primary school period (Biggs et al., 2010; Boivin, Petitclerc, Feng, & Barker, 2010), others exclusively focused on secondary school (Barker, Arseneault, Brendgen, Fontaine, & Maughan, 2008; Sumter, Baumgartner, Valkenburg, & Peter, 2012). Overall, the findings suggest that the vast majority of youth experience consistently low or moderate levels of victimization and only a small minority suffers from chronically high victimization by peers. These studies also indicate that, among those with non-stable trajectories, more children follow increasing rather than decreasing victimization trajectories in primary school, whereas the reverse seems to be true in secondary school. Only two studies, to our knowledge, have explicitly included the transition period from primary to secondary school in their data. Using self-reported peer victimization, Goldbaum and colleagues (Goldbaum, Craig, Pepler, & Connolly, 2003) assessed a sample of 5th to 7th graders (age range 9-14 years) at three time points (fall year 1; spring year 1; fall year 2) and found four trajectory groups: non-victims (88%), late onset victims (4%), desisters (6%), and stable victims (2%). However, although for the sixth graders this time frame included the transition

to secondary school after grade 6, this was not the case for the other students in their sample. Also based on self-reports, another study examined peer victimization trajectories using longitudinal data for a single age-cohort and over a somewhat longer period, with yearly assessments from grade 5 (age 10) to grade 8 (age 13) (Haltigan & Vaillancourt, 2014). Two groups were identified, with the majority (85%) following a consistently low/declining pattern of peer victimization and the remainder (15%) following a moderate/declining pattern of victimization. While informative, these two studies covered a relatively limited time frame of three or four years, respectively. Moreover, their discrepant findings preclude specific conclusions about the number and shape of distinct longitudinal patterns of peer victimization from primary to secondary school. Assessment periods covering more years before and after the school transition for the same longitudinal sample are needed to gain a more complete picture of the distinct trajectories of peer victimization across school contexts.

Predictors of Peer Victimization Trajectories

Research suggests that peer victimization over extended periods carries the most serious risk for future adjustment, with chronic victims showing the highest levels of internalizing problems and social isolation as well as the lowest levels of school liking (Biggs et al., 2010; Boivin et al., 2010; Bowes et al., 2013; Goldbaum et al., 2003; Kochenderfer-Ladd & Wardrop, 2001; Scholte et al., 2007; Smith, Talamelli, Cowie, Naylor, & Chauhan, 2004). Knowledge of the predictors of chronic peer victimization from primary to secondary school is thus crucial to identify at-risk children and plan effective interventions (Paul & Cillessen, 2003). Of specific interest, from a prevention perspective, is the identification of factors that distinguish chronic victims from non-victims, as well as those that account for why some youths who are victimized in primary school escape the same cruel fate in secondary school. To date, however, relatively little is known about the factors that predict temporary and chronic victimization during primary and secondary school. Nevertheless, important clues can be derived from short-term longitudinal studies, which suggest that pre-existing aggression or

internalizing behavior problems are among the most important risk factors of peer victimization (Reijntjes et al., 2011; Reijntjes, Kamphuis, Prinzie, & Telch, 2010). Whereas children who exhibit internalizing symptoms may be seen as “easy targets”, aggressive children may become victimized because their behavior irritates or provokes potential bullies.

However, as suggested by Boivin and colleagues (Boivin et al., 2010), the relative role of aggression and internalizing behaviors as risk factors of victimization may vary across different developmental periods. Whereas internalizing behaviors such as anxiety and social withdrawal become more salient and more negatively perceived by peers with age, aggressive behavior has been linked with increasingly positive peer status and less with victimization as children grow into adolescents (M. Boivin et al., 2010; Cillessen & Mayeux, 2004). These findings suggest an evolving role of aggression vs. internalizing problems in predicting victimization. Some support for this notion comes from the previously mentioned study based on two time points by Bowes and colleagues (Bowes et al., 2013). These authors found that victimization only in primary school was predicted by pre-existing aggressive-antisocial behavior but not by internalizing problems at age 5, whereas chronic victimization in primary school and in secondary school was predicted by both pre-existing aggression and internalizing problems. Predictors of victimization in secondary school only were unfortunately not examined in the Bowes et al. study. Still, a formal test of the Boivin et al. hypothesis based on differential longitudinal trajectories of victimization across school transitions is lacking.

Equally important as the examination of personal risk factors is the identification of family-related factors that may contribute to or reduce children’s risk of chronic peer victimization from primary to secondary school. Of specific pertinence in this regard may be the degree of warmth and social support and of conflict in the parent-child relationship. Social support is defined as the degree to which an individual is esteemed and valued and is provided with instrumental help or companionship (Taylor, 2011). Although especially older children and adolescents can also obtain these provisions

from close friends, parents usually remain the principal source of social support throughout childhood and adolescence (Furman & Buhrmester, 1992). Parental warmth and support is especially important when youngsters experience high levels of stress (Frey & Röthlisberger, 1996). Since the transition to secondary school necessitates adjustment not only to new academic tasks but also to a new peer group, this period may be specifically stressful for youth who were victimized in primary school. Parents who listen and empathize and who show praise, affection and trust may help enable their child to develop the social attitude and skills necessary to improve their social interactions with peers in the new school setting, which in turn may reduce the risk of further victimization. In contrast, a parent-child relationship characterized by a high level of conflict and negativity is believed to undermine the child's ability to positively relate to others, thus increasing the risk of peer victimization (Nickerson, Mele, & Osborne-Oliver, 2010). A recent meta-analysis revealed that high levels of parental warmth and encouragement and low levels of coercion and conflict are indeed associated with decreased peer victimization childhood and adolescence (Lereya, Samara, & Wolke, 2013). The reviewed studies typically examined peer victimization at only one point in time, however, and it is unclear to what extent positive and negative features of the parent-child relationship are associated with distinct trajectories of peer victimization.

In addition to main effects, the parent-child relationship may also interact with children's personal characteristics to predict their peer victimization trajectories. To date, research has mostly examined whether parental support interacts with peer victimization to predict internalizing and externalizing outcomes (Desjardins & Leadbeater, 2011; Stadler, Feifel, Rohrmann, Vermeiren, & Poustka, 2010; Yeung & Leadbeater, 2010). There is evidence, however, that social support from friends or a good relationship with the teacher can attenuate the risk of peer victimization in children with aggression or internalizing problems (Chang et al., 2007; Hodges, Boivin, Vitaro, & Bukowski, 1999). A high level of parental warmth and support might thus protect especially vulnerable youth

against peer victimization in a similar way. Whether such protective effect exists and equally applies to distinct trajectories of peer victimization during primary and secondary school, still remains to be seen.

The Present Study

To address the previously identified issues, the main goal of the present study was 1) to identify groups with distinct trajectories of peer victimization over a six-year period from primary school through the transition to secondary school, and 2) to assess the additive and interactive contribution of personal factors (i.e., aggressive or internalizing behaviors, respectively) and familial factors (i.e., warmth/support and conflict in the parent-child relationship) to the prediction of membership in these trajectory groups. To this end, we used repeated measurements from grade 4 (age 10) in primary school through grade 9 (age 15) in secondary school.

Hypothesis 1. Based on the empirical evidence reviewed above (Goldbaum et al., 2003; Haltigan & Vaillancourt, 2014; Scholte et al., 2007), we expected to identify up to four trajectory groups that include a majority with no or low levels of peer victimization throughout the assessment period and a decreasing trajectory group who are mostly victimized in primary school but not or much less in secondary school. We also expected to find a minority who is chronically victimized across both school contexts and potentially also a small increasing trajectory (i.e., representing those who are not or seldom victimized in primary school but much more in secondary school). However, since most previous studies (Haltigan & Vaillancourt, 2014; Reavis et al., 2010; Shell et al., 2014; Troop-Gordon & Ladd, 2005) suggest an overall decrease rather than an increase in peer victimization, this latter group was expected to be of relatively small size.

Hypothesis 2. As hypothesized by Boivin and colleagues (Boivin et al., 2010) and in line with findings by Bowes and colleagues (Bowes et al., 2013), youngsters who are victimized in primary school, but no longer or less in secondary school should be characterized mainly by pre-existing aggressive behavior but not necessarily by pre-existing internalizing problems than those following a

trajectory of little or no victimization. In contrast, those who are mainly harassed in secondary school but not or less in primary school should be characterized mostly by pre-existing internalizing behavior according. Chronic victims in primary and secondary school should display both problems early on.

Hypothesis 3. In line with previous research on peer victimization in children and adolescents (Lereya et al., 2013), we also expected that the risk of following an elevated victimization trajectory in either primary or high school should be counterbalanced (either via a main effect or an interaction effect) by a warm and supportive parent-child relationship. In contrast, a high degree of parent-child conflict should increase the risk of following an elevated peer victimization trajectory.

These associations were examined while controlling for the effect of child sex as well as family income, maternal education and non-intact family status, as some findings indicate that boys and youth from families with a disadvantaged socio-economic status may be more at risk of being victimized by their peers than others (e.g., Bowes et al., 2013). Moreover, although the vast majority of previous studies did not report or did not find differential parental effects on peer victimization for boys and girls (see the meta-analysis by Lereya et al., 2013), one study found that negativity in the parent-child relationship was related to peer victimization mainly in girls (Finnegan, Hodges, & Perry, 1998). We therefore also examined potential moderating effects of sex in the hypothesized associations.

The questions addressed by the present study were investigated using a convenience sample of twins. Twin samples have been used in previous studies on peer victimization even when genetic effects were not the focus of the research question (Arseneault et al., 2006; Lamarche et al., 2007; Renouf et al., 2010). Importantly, empirical evidence suggests twins' peer relations, including their victimization experiences, do not differ from those of non-twin children (Boivin et al., 2013; Koch, 1966; Thorpe, 2003). Twin samples and singleton samples also do not differ with respect to social-psychological adjustment, including aggressive behavior and internalizing problems (Bekkhuis, Staton,

Borge, & Thorpe, 2014; Moilanen, 1999). Moreover, although parental stress is greater after twin births, the parent-child relationship does not differ for twins and singletons (Lytton & Gallagher, 2005).

Methods

Sample

The 767 children (403 girls, 364 boys) participating in this study were part of a population-based sample of 662 Monozygotic (MZ) and Dizygotic (DZ) twin pairs (1324 individuals) recruited at birth (Boivin et al., 2012). Participants were recruited from the Québec Newborn Twin Registry, which identified all twin births occurring in the Province of Québec between 1995 and 1998. All parents in the registry living in the Greater Montreal area were asked to enroll with their twins in the study ($n = 989$ families) and 662 families agreed to participate. Zygosity was assessed by genetic marker analysis of 8-10 highly polymorphous genetic markers and twins were diagnosed as MZ when concordant for every genetic marker. When genetic material was insufficient or unavailable due to parental refusal (43% of cases), zygosity was determined based on physical resemblance questionnaires at 18 months and again at age 9 (Spitz et al., 1996). Eighty-seven percent of the families were of European descent, 3% were of African descent, 3% were of Asian descent, and 1% were Native North Americans. The remaining families did not provide ethnicity information. The demographic characteristics of the twin families were extremely similar to those of families with a 5-month old infant from a representative population-based birth-sample of singletons assessed in 1998 by the Quebec Ministry of Health and Social Services (Jetté & Des Groseilliers, 2000). Specifically, the same percentage (95%) of parents in both samples lived together at the time of birth of their child(ren); 44% of the twins compared with 45% of the singletons were the firstborn children in the family; 66% of the mothers and 60% of the fathers of the twins were between 25 and 34 years of age compared with 66% of the mothers and 63% of the fathers of the singletons; 17% of the mothers and 14% of the fathers of the twins had not finished high school compared with 12% and 14% of the parents of the singletons; the same proportion of

mothers (28%) and fathers (27%) in both samples held a university degree; 83% of the twin families and 79% of singleton families held employment; 10% of the twin families and 9% of the singleton families received social welfare or unemployment insurance; and finally, 30% of the twin families and 29% of the singleton families had an annual income of less than \$30,000, 44% (42%) had an annual income between \$30,000 and \$59,999, and 27% (29%) had an annual income of more than \$60,000.

The sample was followed at 5, 18, 30, 48, and 60 months focusing on a variety of child-related and family-related characteristics. New annual or bi-annual data collections were started once the children entered kindergarten (i.e., age 6). The present paper uses data collected at the end of the grade 4, 6, 7, 8, and 9 school years (mean age = 10.04 years, $SD = .26$, at the grade 4 data collection and mean age = 15.04 years, $SD = .26$, at the grade 9 data collection). No data were collected in grade 5 due to a lack of funds. The transition from primary to secondary school occurred after grade 6 (age 12).

Participants with valid victimization data for at least one out of the five measurement points as well as for at least one predictor variable (see description of measures below) were included in the present analyses ($n = 767$ individuals). The participants in the final study sample did not differ from those who were lost through attrition in regard to family status, parental education, parents' age or family income. A comparison in regard to mother-rated aggressive or anxious behavior at ages 18 to 48 months revealed no differences between those included in the present study and those excluded. Active written consent from the parents of all participating children and verbal assent from the children was obtained for each new wave of data collection. In each wave, data collection took place towards the end of the school year. Instruments were approved by the University of Quebec Institutional Review Board.

Measures

Measures of *Peer Victimization* of each participant were obtained at the end of grades 4, 6, 7, 8, and 9 (which largely corresponds to ages 10, 12, 13, 14, and 15 years, respectively) via self-reports on items based on the Social Experiences Questionnaire (Crick & Bigbee, 1998). Based on the highest

factor loadings reported by Crick and Bigbee (1998), we used four out of the five items from the Relational Victimization subscale and three out of the four items from the Overt Victimization subscale of the SEQ. We adapted some of the wording slightly to facilitate comprehension in our sample, e.g.: “During this school year, how many times has a student at your school... called you names or said mean things to you?,... said mean things about you to other children? ..., stopped you from joining his or her group when you wanted to play/join in?, ... pushed, hit or kicked you?”. We also added a fourth overt victimization item to measure face-to-face theft/mugging: “...force you to give him or her something that belonged to you?”. Responses were given on a three-point scale from 0 (never) to 2 (often). For each time point, item scores were averaged to a global peer victimization score (Grade 4 Cronbach’s alpha = .79, *Mean* = .68, *SD* = .43; Grade 6 Cronbach’s alpha = .79, *Mean* = .48, *SD* = .36; Grade 7 Cronbach’s alpha = .78, *Mean* = .36, *SD* = .33; Grade 8 Cronbach’s alpha = .75, *Mean* = .24, *SD* = .27; Grade 9 Cronbach’s alpha = .69, *Mean* = .19, *SD* = .23). Observed values ranged from a minimum of 0 to a maximum of 2, skewness ranged from .54 to 1.48, and kurtosis ranged from -.23 to 1.89 across the different time points.

Aggression and internalizing problems of each twin were measured using peer nominations in each twin’s classroom at the end of grade 4 (age 10). Participation rate per class - based on active parental consent for each child in a class - varied between 73% and 80%. A roster with the names of all children in a class with parental consent to participate was handed out to all participating children in the classroom. The children were then asked to nominate up to three classmates who best fit behavioral descriptors selected from the Revised Class Play (Masten, Morison, & Pellegrini, 1985). Four descriptors were used for *aggression* (“Fights often with others”, “often hits and pushes others”, “often tells their friends not to play/ hang out with others”, “often says mean things about others”) and four descriptors for *internalizing problems* (“is often sad”, “is often unhappy”, “is often shy-withdrawn”, “often prefers to play or be alone”). Separately for aggression and internalizing problems, the total

number of received nominations of all relevant item descriptors was calculated for each child in the class and z -standardized within classroom to account for differences in classroom size. Item scores were then averaged to create scale scores (Cronbach's alpha = .85, $mean = .00$, $SD = .97$, $min = -1.22$, $max = 4.60$, $skew = 1.92$, $kurtosis = 3.50$ for aggression and Cronbach's alpha = .79, $mean = -.03$, $SD = .93$, $min = -1.49$, $max = 4.29$, $skew = 1.74$, $kurtosis = 3.31$ for internalizing problems).

The parent-child relationship at the end of grade 7 (age 13), which is the year right after transition to secondary school, was assessed via mother reports using eight items adapted from the Parenting Scale of the National Longitudinal Survey of Children and Youth (NLSCY, 1995). Five items referred to *warmth and support* in the relationship over the past year (e.g., “talk or spend time with this child just for fun”, “say to the child that you are proud of him/her”, “do sports activities or play games or other activities with this child”) with a 7-point Likert scale ranging from 0 (Never) to 6 (Several times a day). Three items referred to conflict over the past year (“this child and I bother each other and get on each other's nerves”, “we shout at one another”, “we disagree and argue”) with a 5-point Likert scale ranging from 0 (Never) to 4 (All the time). Individual item scores were averaged to a *Warmth/Support* scale and a *Conflict* scale, respectively (Cronbach's alpha = .77, $Mean = 3.07$, $SD = .96$, $min = .6$, $max = 6$, $skewness = -.01$, $kurtosis = -.32$ for Warmth/Support; Cronbach's alpha = .81, $Mean = 1.22$, $SD = 0.78$, $min = 0$, $max = 4$, $skewness = .35$, $kurtosis = -.46$ for Conflict).

Control variables. Mothers also reported on *Family Status* (i.e., living with both biological parents (69%) vs. non-intact (31%)), on their level of *Education* (measured in years of schooling, $mean = 13.91$, $SD = 3.11$, $min = 5$, $max = 20$, $skewness = -.91$, $kurtosis = .88$) as well as on *Family Income* ($mean = 64.90$, $SD = 30.32$, $min = 5$, $max = 100$, $skewness = -.30$, $kurtosis = -1.20$).

Analyses

Preliminary Analyses

The bivariate correlations of the study variables are presented in Table 1. Boys had fewer internalizing problems but were more aggressive and they were also more victimized by peers than girls across all measurement times. Aggression was related to more parent-child conflict, as well as to higher levels of peer victimization across all measurement times. Internalizing problems were also related to a lower level of parental education as well as to higher levels of peer victimization during three out of the five measurement times. A warm and supportive parent-child relationship was related to less peer victimization only at one out of the five measurement times, whereas parent-child conflict was associated with higher levels of peer victimization across all time points. Lower family income was associated with higher levels of peer victimization at one out of the five measurement times. A lower level of maternal education and living in a non-intact family were associated with higher levels of peer victimization at two out of the five measurement times. Finally, peer victimization was moderately stable from one year to the next, as well as across multiple time points. Additional analyses revealed that zygosity was not associated with any of the study variables nor did it moderate the associations observed in the main analyses. Zygosity was thus not included in subsequent analyses.

Identification of Latent Trajectories Classes of Peer Victimization

In the first set of analyses, Group-based Trajectory Modeling (Nagin & Odgers, 2010) was performed with Mplus Version 6.11 (Muthén & Muthén, 1998-2010) to identify latent trajectory classes of peer victimization from grade 4 through 9 (ages 10 through 15). In contrast to standard Growth Mixture Modeling, Group-based Trajectory Modeling does not allow within-group variances to vary but rather estimates one joint variance. This approach was chosen because our goal was to identify a finite number of groups to approximate the unknown distribution of victimization trajectories within the population, rather than assuming that the population distribution of victimization trajectories is composed of truly distinct subpopulations (Nagin & Odgers, 2010). Using a normal mixture distribution, a series of models was fitted, beginning with a 1-group trajectory model and moving to a

5-group trajectory model. All models were specified with both linear and quadratic trends for each group. The best fitting model was established using the Bayesian Information Criteria (BIC), Entropy, and the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), as well as the average posterior assignment probabilities. The BIC is a commonly used fit index where lower values indicate a more parsimonious model. Entropy is a measure of classification accuracy with values closer to 1 indexing greater precision (range 0 to 1). LMR-LRT provides a $k-1$ likelihood-ratio based method for determining the ideal number of trajectories; a low p-value (below .05) indicates that the k trajectory model is a better fit to the data compared to the $k-1$ trajectory model. The *average posterior assignment probability* is calculated by averaging the posterior probabilities of the individuals assigned to a specific trajectory group. Average posterior probabilities greater than .70 to .80 indicate that the modelled trajectories group individuals with similar longitudinal profiles and discriminate between individuals with dissimilar profiles. As previously mentioned, participants with valid data for at least one out of the five measurement points were included in the analyses ($n = 767$ individuals). To account for missing data (14% of data points) and for data interdependency due to twinning, models were fitted using Full Information Maximum Likelihood (FIML) estimation and the COMPLEX option for adjusting standard error estimates. Extremely similar results were obtained when models were specified with one randomly chosen twin of a pair as unit of analysis.

Prediction of Latent Trajectories Classes of Peer Victimization

The best fitting trajectory model was then expanded to include predictor variables (Nagin & Odgers, 2010). Again, Full Information Maximum Likelihood (FIML) estimation and the COMPLEX option adjusting standard error estimates was used to account for missing data (13% of data points) and to control for data interdependency due to twinning. All predictor variables were simultaneously included in the model: Non-intact family status, family income, maternal education, child sex, aggression in grade 4 (age 10), internalizing problems in grade 4 (age 10), parent-child warmth/support

and parent-child conflict in grade 7 (age 13). We also included two-way interactions between each of the two features of the parent-child relationship and aggression or internalizing problems, respectively, as well as a two-way interaction between aggression and internalizing problems. Potential two-way interactions between each of the main predictor variables and child sex (as well as three-way interactions between child sex and the two-way interactions mentioned above) were also evaluated in additional models, but were found to be nonsignificant and are therefore not presented here for parsimony. The relative effect size of each predictor variable indicates the amount of increase (or decrease) in the risk of following a given latent trajectory relative to following a comparison trajectory. To facilitate interpretation of potential interaction effects, all predictor variables except non-intact family status and child sex were centered via z-standardization prior to creating interaction terms.

Results

Identification of Latent Trajectories Classes of Peer Victimization

Figure 1 presents the 3-group trajectory model and the fit indices for the 1- to 5-group trajectory models. The BIC steadily decreased with increasing number of groups. However, the LMR-LRT clearly favored the 3-group over the 2-group trajectory model, whereas the 4-group and the 5-group trajectory models did not provide superior fit compared to the 3-group model. Moreover, Entropy values did not favor the 4-group model over the 3-group model. Because the 3-group model also showed excellent average posterior assignment probabilities (ranging from .84 to .93), we retained the 3-group trajectory model as the optimal solution. Inspection of the 3-group model revealed one group (62% or 475 participants) who experienced little victimization in elementary school and even less in secondary school (Low-Decreasing group; Intercept = 0.55, $p = .001$; Linear trend = -0.16, $p = .001$; Quadratic trend = 0.02, $p = .001$). The second group (31% or 238 participants) was frequently victimized in elementary school but steadily decreased to much less victimization in secondary school (High-Decreasing group; Intercept = 0.90, $p = .001$; Linear trend = -0.13, $p = .001$; Quadratic trend =

0.00, ns). The third group (7% or 54 participants) was frequently and increasingly victimized in primary school and even after the transition to secondary school, with a more marked decrease in victimization only after grade 7 (High-Increasing-Decreasing group; Intercept = 0.92, $p = .001$; Linear trend = 0.20, $p = .001$; Quadratic trend = -0.05, $p = .001$). Notably, although this group eventually experienced a more substantial decrease in peer victimization in grades 8 and 9 (ages 14 and 15), they remained the target of more frequent victimization than youth in the other two trajectory groups throughout the assessment period.

Supplementary analyses were performed to explore whether there was discontinuity in the victimization trajectories of the three identified groups during the transition from primary to secondary school. To this end, a three-group model was specified where – within each group - separate intercept and slope parameters were estimated for the two measurement times in primary school (i.e., grades 4 and 6) and for the three times in secondary school (i.e., grades 7, 8 and 9) (Supplementary Table 1 and Supplementary Figure 1). Model fit was very similar to that of the initial three-group model, with overall very similar trajectory shapes in each group and the proportion of participants in the different groups was also the same. Further inspection of the curves showed that, for the Low-Decreasing group, the decreasing trajectory in secondary school seemed to be a continuation of the already low and further decreasing trajectory in primary school. In contrast, although the High-Decreasing group already showed a slight decrease of victimization in primary school, their victimization trajectory in secondary school was even lower at the start (grade 7) than what would be expected based on their primary school victimization levels - and also decreased even more rapidly thereafter. For the High-Increasing-Decreasing group, the consistently high victimization trajectory in primary school was followed by an even higher level of victimization at the start of secondary school (grade 7), with a notable decrease in victimization only from grade 8 onwards. The results from this supplementary model further support the notion that one of the two high victimization trajectory groups can be

described as experiencing frequent victimization mostly in primary school, and the other as experiencing frequent victimization even after the transition from primary to secondary school.

Prediction of Latent Trajectories Classes of Peer Victimization

Table 2 presents the unique association of each predictor variable with membership in the High-Decreasing or the High-Increasing-Decreasing victimization trajectory group relative to membership in the Low-Decreasing victimization trajectory group. The results showed that boys were more likely than girls to follow a High-Decreasing victimization trajectory ($B = 0.80, p = .001; OR=2.22$). High levels of aggression ($B = 0.55, p = .03; OR=1.73$) and of parent-child conflict ($B = 0.28, p = .04; OR=1.32$) were also associated with membership in the High-Decreasing victimization trajectory. However, a high level of warmth and support in the parent-child relationship decreased the risk of following a High-Decreasing victimization trajectory ($B = -0.22, p = .05; OR=0.80$).

Boys were also more likely than girls to follow a High-Increasing-Decreasing victimization trajectory ($B = 1.86, p = .001; OR=6.25$) relative to membership in the Low-Decreasing victimization trajectory group. The same was true for youth from non-intact families ($B = 1.24, p = .02; OR=3.45$) and those experiencing a high level of parent-child conflict ($B = 0.57, p = .01; OR=1.77$). Moreover, both high levels of internalizing problems ($B = 0.93, p = .001; OR=2.53$) and of aggression ($B = 0.72, p = .01; OR=2.06$) predicted membership in the High-Increasing-Decreasing victimization trajectory. However, there was also an interaction between aggression and internalizing problems ($B = 0.69, p = .02$). Probing of this interaction revealed that a high level of aggression predicted membership in the High-Increasing-Decreasing victimization trajectory only in youth with moderate or high levels of internalizing problems (i.e., with internalizing problems at the mean; $B = 0.72, p = .01, OR=2.06$; and at 1 SD above the mean; $B = 1.41, p = .03, OR=4.10$). In contrast, when the level of internalizing problems was low (i.e., 1 SD below the mean), aggression no longer predicted membership in the High-Increasing-Decreasing victimization trajectory ($B = 0.03, p = .92, OR=1.03$).

The comparison between the High-Increasing-Decreasing and the High-Decreasing victimization trajectory groups revealed that the former consisted more frequently of youth from non-intact families than the latter ($B = 1.20, p = .03; OR=3.33$). Moreover, members of the High-Increasing-Decreasing victimization trajectory group were characterized by significantly higher levels of internalizing problems during childhood than members of the High-Decreasing victimization trajectory group ($B = 0.56, p = .01; OR=1.76$). In addition, there was an interaction between aggression and parent-child conflict ($B = -0.52, p = .02$). Probing of this interaction revealed that a higher level of aggression predicted the High-Increasing-Decreasing victimization trajectory relative to the High-Decreasing victimization trajectory only when parent-child conflict was low (i.e., 1 SD below the mean: $B = 0.69, p = .05; OR=1.99$), but not when parent-child conflict was moderate or high (i.e., at the mean: $B = 0.17, p = .45, OR=1.19$; at 1 SD above the mean: $B = -0.34, p = .19, OR=0.71$).

Discussion

The goals of this study were 1) to identify groups with distinct trajectories of peer victimization over a six-year period from primary school through the transition to secondary school and 2) to examine the additive and interactive predictive effects of personal factors (i.e., aggression and internalizing problems) and familial factors (i.e., warmth/support and conflict in the parent-child relationship) associated with these trajectories, while controlling for socio-economic context variables.

As expected (Hypothesis 1), the vast majority of youngsters reported little victimization from peers in primary school and even less in secondary school. This result concords with other trajectory studies covering similar or different age periods (Barker et al., 2008; Biggs et al., 2010; Boivin et al., 2010; Goldbaum et al., 2003; Haltigan & Vaillancourt, 2014; Sumter et al., 2012). Previous evidence also suggests that most of these youths are unlikely to have been the target of attacks prior or after that period (Nylund, 2007). Also in line with previous research covering a similar age period (Goldbaum et al., 2003), there was a sizable group of students who were frequently victimized in primary school, but

who experienced little harassment in secondary school. However, in contrast to Goldbaum et al. (2003) but in line with Haltigon and Vaillancourt (2014), we found no group of “increasers” (i.e., who were frequently victimized in secondary school but not in primary school). Interestingly, the group of “increasers” in the Goldbaum et al. study was also much smaller than the “decreaser” group. Moreover, evidence from other studies suggests that most students who change victim status transition from more to less victimization (Nylund, 2007; Williford, Brisson, Bender, Jenson, & Forrest-Bank, 2011). Our results indicate that a small group of primary school victims continues to be more frequently bullied than others after the transition to secondary school, even if their overall level of harassment declines somewhat. As the prognosis for later adjustment is particularly somber for this group, knowledge about the predictors of chronic versus decreasing peer victimization from primary to secondary school is essential for effective interventions (Paul & Cillessen, 2003).

Personal Predictors of Peer Victimization Trajectories

Our findings indicate that both personal and familial factors play an important role in explaining peer victimization over the course of primary and secondary school. In terms of personal risk factors, our findings are in line with previous studies showing that aggression as well as internalizing behavior increases the risk of peer victimization (Reijntjes et al., 2011; Reijntjes et al., 2010). However, as expected (Hypothesis 2), the present results suggest notable differences in this regard between the different victimization trajectory groups: A peer victimization trajectory that was largely limited to the primary school period was explained only by pre-existing aggressive behavior, but not by internalizing problems. In contrast, youth who were chronically victimized during primary and secondary displayed both problem behaviors in childhood. Moreover, chronically victimized children showed more pre-existing internalizing problems but not more aggression in childhood than those who were victimized in primary school but not thereafter.

These results may be explained by the fact that, whereas anxious and withdrawn behavior is perceived as relatively normative in primary school, such behavior increasingly marks individuals as ‘nerds’ and conveys a status of vulnerability (Boivin et al., 2010). In contrast, aggressive behavior is highly disapproved of by younger children, but becomes increasingly tolerated and may even be associated with popularity as children grow into adolescents (Boivin et al., 2010; Cillessen & Mayeux, 2004). When aggression is acceptable, peers may abstain from provoking aggressive children – especially those who are not fearful and easily intimidated. But if aggression without co-occurring internalizing problems did not convey increased risk of chronic peer victimization, why were aggressive children with internalizing problems at risk of being chronically victimized? Aggressive youth with concomitant internalizing problems often tend to use aggression in a reactive manner, e.g., in response to threats by others (Vitaro & Brendgen, 2011). Peers may perceive their angry outbursts as provocative or even amusing, which may lead to further ridiculing and harassment (Lamarche et al., 2006). Unfortunately, these aggressive responses do not seem to be effective in countering peer attacks, (Lamarche et al., 2007). Perhaps out of frustration, these victimized youth may eventually turn to bullying others who are even weaker than themselves (Barker et al., 2008). Research shows that such a ‘bully-victim’ status is more stable than that of pure victims or pure bullies (Camodeca, Goossens, Meerum Terwogt, & Schuengel, 2002), which may further explain why the combination of aggression and internalizing problems predicted chronic peer victimization in the present study. In contrast, aggressive youth without internalizing problems mainly use aggression proactively to dominate others or for material gains – a behavior that has been strongly associated with pure bullies who are not victimized themselves (Camodeca et al., 2002). Unlike reactively aggressive youth, proactive aggressive children also tend to form joint friendship groups (Poulin & Boivin, 2000), which may promote the bullying of others while offering protection against victimization. This may further explain

why aggression – in the absence of internalizing problems – did not increase the risk of chronic peer victimization from primary to secondary school.

Familial Predictors of Peer Victimization Trajectories

In addition to children's behavioral characteristics, the quality of the parent-child relationship also played an important role in explaining children's peer victimization in primary and secondary school. As expected (Hypothesis 3), and similar to results from previous cross-sectional or short-term longitudinal studies (Beran & Violato, 2004; Finnegan et al., 1998; Lereya et al., 2013), a warm and supportive parent-child relationship was associated with less victimization in our sample. Unfortunately, the growth-mixture models showed that this beneficial effect of parental support was only observed in regard to the High-Decreasing trajectory (i.e., peer victimization that was limited to primary school). Although the parent-child relationship was only assessed during the transition year from primary to secondary school, both positive and negative features of the parent-child relationship show considerable test-retest stability over time (Laursen, DeLay, & Adams, 2010). Thus, for many youngsters, the relative degree of parental warmth and support and parent-child conflict during the transition to secondary school likely reflects the quality of the parent-child relationship in previous years. A warm and supportive relationship with parents may provide a working model for youngsters to develop the skills necessary for positive peer interactions, thus reducing the risk of victimization. Supportive parents may also be more likely to directly intervene in their children's peer interactions when problems occur. However, victims of peer harassment become increasingly reluctant to tell parents about their experiences as they get older (Mishna & Alaggia, 2005). This reluctance is often due to perceptions of adult responses as being either ineffective or excessive, as well as due to adolescent peer cultures that discourage seeking help from adults (Oliver & Candappa, 2007). As a result, even parents who share a warm and supportive relationship with their adolescent may not

necessarily be aware of their offspring's plight, thus explaining the lack of association with chronic peer victimization into secondary school.

Also in line with results from previous studies (Lereya et al., 2013), a large degree of conflict in the parent-child relationship was associated with a greater risk of following any elevated trajectory of peer victimization (i.e., High-Increasing-Decreasing or High-Decreasing). Parent-child interactions characterized by frequent hostility and irritation have been shown to impede the development of the social skills necessary for effective communication and conflict resolution with others, which can put children and adolescents at greater risk of being disliked by peers (Domitrovich & Bierman, 2001). In addition to its main effect, parent-child conflict also interacted with child aggression to differentiate those who followed a chronic peer victimization trajectory from those who were victimized only in primary school. Specifically, and unexpectedly, youth following the High-Increasing-Decreasing victimization trajectory were characterized by a higher level of aggression coupled with very low levels of parent-child conflict compared to youth following the High-Decreasing trajectory. In the case of highly aggressive youth, a very low level of parent-child conflict may indicate a *laissez-faire* approach vis-à-vis their offspring's inappropriate behaviors. If parents do not object but instead give in to a child's angry outbursts to avoid conflict, their child may have little opportunity to learn how to regulate negative emotions. This lack of skill may permeate across different contexts and thus put children at risk of continued peer difficulties, including victimization, over time.

Strengths, Limitations and Conclusions

This is the first study to investigate the additive and interactive effects of children's aggression or internalizing problems and the parent-child relationship in predicting their trajectories of peer victimization from primary to secondary school. The longitudinal design spanning three years prior and three years after the transition to secondary school made it possible to gain a more complete picture of the distinct trajectories of peer victimization across school contexts - and the associated predictors -

than could be obtained from previous research. A further strength of the present study is the use of different reporting sources for the different variables at play (i.e., peer nominations, self-reports, parent reports) to reduce the risk of inflated associations due to shared source variance.

In addition to these strengths, the study also has several limitations. First among these is the sole use of self-reports to assess the longitudinal trajectories of peer victimization. Unfortunately, other reporting sources were not available beyond primary school. Several scholars have argued that self-reports provide valid and important information about personal victimization experiences, as third parties may not be privy to all incidences of harassment (Crick & Bigbee, 1998; Graham, Bellmore, & Juvonen, 2003; Olweus, 1993). However, self-reports of peer relation difficulties (including victimization) are only moderately correlated with peer, teacher, or parent reports (Boivin et al., 2013; Bowes et al., 2013; Crick & Bigbee, 1998; Graham et al., 2003). Like reports from other sources, self-reports of peer difficulties can also be subject to perception bias (Graham et al., 2003). If sufficient convergence between reporters can be achieved, the use of multiple reporting sources in future studies will likely offer the most accurate account of peer victimization trajectories from primary to secondary school. Moreover, to gain a more complete picture of the unique role of the parent-child relationship in predicting children's peer victimization trajectories from primary to secondary school, it would also be useful to include information regarding other social context variables, such as the relationship with peers (e.g., number of friends, friendship quality, friends' victimization status) in future studies.

A further limitation is the fact that the parent-child relationship was only assessed during the school transition. At this point, the parent-child relationship may itself have been influenced by children's behavior and their victimization experiences via evocative pathways, including possible gene-environment correlation processes (Scarr & McCartney, 1983). Future studies with measures of the parent-child relationship at the start of the trajectory modeling would be stronger, as would be

longitudinal analyses of cross-lagged links to more clearly disentangle the directionality of association between the parent-child relationship and peer victimization experiences.

Another limitation concerns the generalizability of the data, both in terms of the covered developmental periods and in terms of sample characteristics. In regard to age range, the fact that consistent measures of self-reported peer victimization were not available prior to grade 4 made it impossible to gauge whether youth in the elevated trajectory groups were indeed bullied throughout primary school. To our knowledge, no study as yet has tracked children's course of peer victimization throughout the entire primary school period using growth mixture models. Nevertheless, there is evidence that, for some unfortunate children, patterns of persistent victimization may already be established during the preschool period when they first come into contact with peers (Barker et al., 2008). Finally, in regard to sample characteristics, generalization could be limited given that data were based on a twin sample. However, empirical evidence suggests that twins do not differ from singletons in terms of their level of peer victimization, their level of aggression and internalizing symptoms during childhood, or their relationship with parents (Bekkhuis et al., 2014; Boivin et al., 2013; Lytton & Gallagher, 2005; Moilanen, 1999; Thorpe, 2003). As previously mentioned, the demographic characteristics of the twin families were also extremely similar to those of a representative sample of families from a population-based birth-cohort study of singletons (Jetté & Des Groseilliers, 2000).

Despite these limitations, the present study provides important new insights about interindividual differences in peer victimization from primary to secondary school and the associated risk and protective factors. Overall, the observed trajectory patterns are in line with studies showing that, on average, peer victimization decreases over the course of middle childhood and into mid-adolescence (Reavis et al., 2010; Troop-Gordon & Ladd, 2005). These findings are encouraging, as they suggest that - in most cases - the transition to secondary school offers the chance to escape previous suffering. Sadly, a small group of children continue to be tormented by their peers even during secondary school

and youth with pre-existing aggressive and internalizing behavior seem to be at specific risk to fall into this category. The good news is that a close and supportive parent-child relationship may help decrease the risk of peer victimization, at least in primary school. Even more important, however, seems to be parents' role in teaching their offspring to regulate their negative emotions and to solve conflicts in a constructive and peaceful manner in order to avoid chronic peer relation difficulties. Together, the present results thus support the notion that parent training as well child-focused activities in current school-based prevention programs are key features for decreasing peer victimization over the long term (Ttofi & Farrington, 2011).

Table 1

Bivariate Correlations of the Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Victimization G4	--											
2. Victimization G6	.41 ***	--										
3. Victimization G7	.32 ***	.58 ***	--									
4. Victimization G9	.27 ***	.41 ***	.55 ***	--								
5. Victimization G9	.17 ***	.37 ***	.42 ***	.44 ***	--							
6. Sex	.15 ***	.21 ***	.18 ***	.13 ***	.09 *	--						
7. Internalizing G4	.06	.20 ***	.13 *	.14 **	.07	-.13 **	--					
8. Aggression G4	.29 ***	.18 ***	.17 ***	.18 ***	.20 ***	.34 ***	-.07	--				
9. Warmth/Support G7	-.05	-.06	-.10 *	-.07	-.06	-.06	.03	-.02	--			
10. Conflict G7	.14 **	.15 ***	.09 *	.11 **	.09 *	-.03	.08	.19 ***	-.07	--		
11. Family Income	-.06	-.12 **	-.03	-.02	-.03	.04	-.04	.01	-.05	.04	--	
12. Maternal Education	-.03	-.11 *	-.10 *	-.04	-.03	.07	-.11 *	-.09	.01	.07	.41 ***	--
13. Non-Intact Family	.11 *	.14 **	.07	.06	.05	.00	.04	.04	.06	.01	-.32 ***	.10

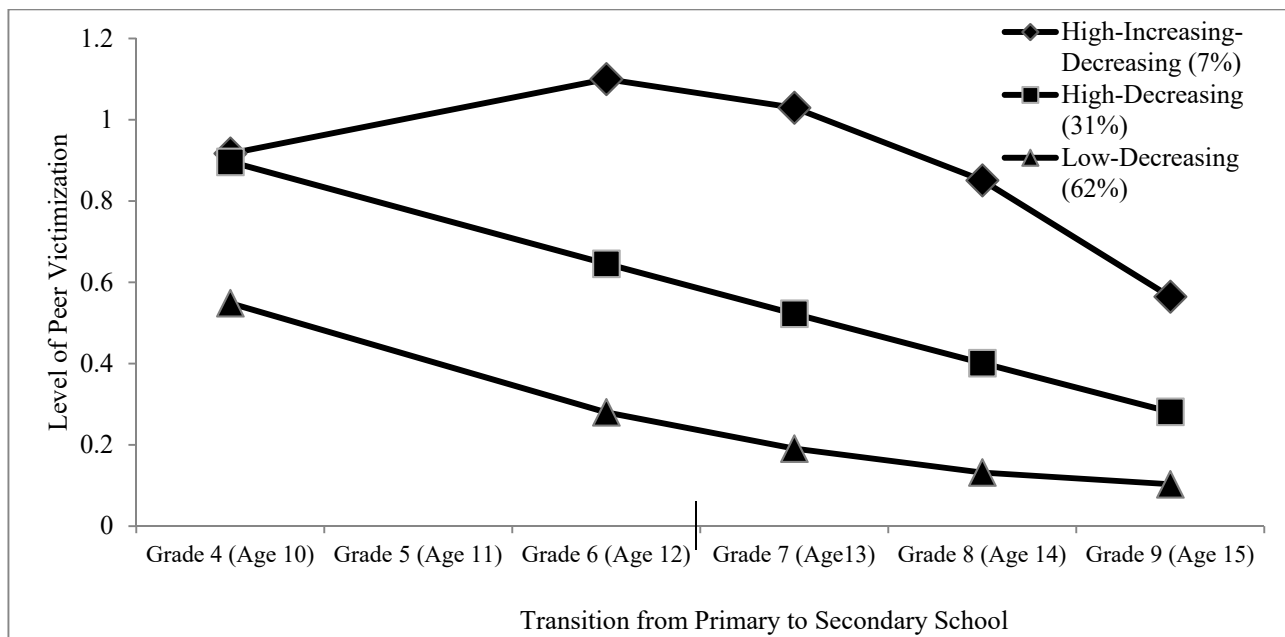
Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. Robust standard errors were used to account for data interdependency due to twinning. Sex was coded such that a higher value designates boys.

Table 2

Predictors of Peer Victimization Trajectories

Predictor	High-Decreasing vs Low-Decreasing				High-Increasing-Decreasing vs Low-Decreasing				High-Increasing-Decreasing vs High-Decreasing			
	Estimate (SE)	p	OR	C. I.	Estimate (SE)	p	OR	C. I.	Estimate (SE)	p	OR	C. I.
Sex	.80 (.24)	.001	2.22	(1.52;4.35)	1.86 (.54)	.001	6.25	(3.13;10)	1.06 (.56)	.06	2.86	(1.37;25)
Family Income	-.09 (.13)	.50	.91	(.67; 1.15)	.07 (.24)	.79	1.07	(.56; 1.58)	.16 (.26)	.55	1.17	(.58; 1.76)
Maternal Educ.	-.02 (.14)	.88	.98	(.72; 1.24)	-.21 (.26)	.42	.81	(.40; 1.22)	-.19 (.26)	.48	.83	(.40; 1.26)
Non-Intact Fam.	.04 (.27)	.89	1.04	(.68; 2.22)	1.24 (.53)	.02	3.45	(1.70;10)	1.20 (.56)	.03	3.33	(1.59;33)
Internalizing G4	.36 (.23)	.11	1.44	(.80; 2.08)	.93 (.25)	.001	2.53	(1.29; 3.76)	.56 (.20)	.01	1.76	(1.05; 2.46)
Aggression G4	.55 (.25)	.03	1.73	(.90; 2.56)	.72 (.28)	.01	2.06	(.93; 3.19)	.17 (.23)	.45	1.19	(.65; 1.72)
Warmth/Support G7	-.22 (.11)	.05	.80	(.62; .98)	-.22 (.20)	.27	.80	(.49; 1.11)	.01 (.20)	.98	1.01	(.61; 1.40)
Conflict G7	.28 (.14)	.04	1.32	(.97; 1.67)	.57 (.22)	.01	1.77	(1.02; 2.52)	.30 (.22)	.19	1.34	(.76; 1.93)
Internalizing X Warmth/Support	-.13 (.16)	.40	.87	(.60; 1.15)	-.02 (.15)	.91	.98	(.70; 1.26)	.12 (.17)	.49	1.12	(.75; 1.50)
Internalizing X Conflict	-.21 (.16)	.20	.81	(.56; 1.07)	-.30 (.19)	.11	.74	(.47; 1.01)	-.09 (.20)	.65	.91	(.56; 1.27)
Aggression X Warmth/Support	-.08 (.16)	.64	.93	(.63; 1.22)	.00 (.19)	.99	1.00	(.63; 1.37)	.08 (.17)	.66	1.08	(.71; 1.44)
Aggression X Conflict	.18 (.24)	.46	1.20	(.63; 1.76)	-.34 (.23)	.14	.71	(.40; 1.03)	-.52 (.22)	.02	.60	(.34; .86)
Internalizing X Aggression	.47 (.28)	.09	1.61	(.72; 2.49)	.69 (.30)	.02	1.99	(.82; 3.16)	.22 (.16)	.19	1.24	(.84; 1.64)

Note. Sex was coded such that a higher value designates boys. Robust standard errors were used to account for data interdependency due to twinning. SE = Standard Error. OR = Odds Ratio. C.I. = Confidence Interval



	1-Group Model	2-Group Model	3-Group Model	4-Group Model	5-Group Model
AIC	1792.20	1129.24	956.39	882.69	800.13
BIC	1829.34	1184.95	1030.67	975.54	911.55
Entropy	--	.86	.78	.78	.82
LMR-LRT p-value	--	.001	.001	.17	.24

Figure 1. Predicted longitudinal profiles of peer victimization from grade 4 to grade 9 (i.e., age 10 to age 15) based on the best fitting (i.e., the 3-group) model. The Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) and Entropy fit statistics can only be calculated for multi-group models.

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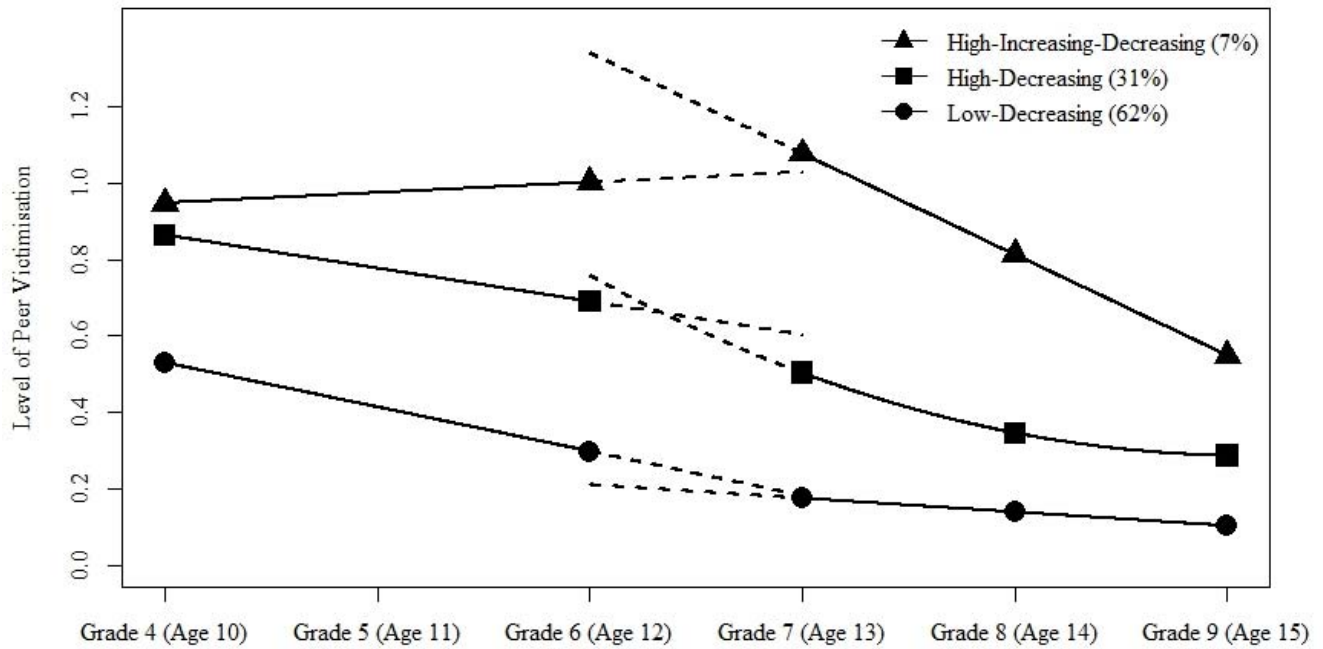
Supplementary Table 1

Trajectory Parameter Estimates and Fit Statistics of the Three-Group Piece-Wise Trajectory Model

Group		Estimate	SE	P-Value
Low-Decreasing	Intercept-P	0.53	0.03	0.00
	Linear-P	-0.12	0.01	0.00
	Intercept-S	0.28	0.02	0.00
	Linear-S	-0.04	0.01	0.00
High-Decreasing	Intercept-P	0.86	0.04	0.00
	Linear-P	-0.09	0.02	0.00
	Intercept-S	1.56	0.39	0.00
	Linear-S	-0.50	0.20	0.01
	Quadratic-S	0.05	0.02	0.05
High-Increasing- Decreasing	Intercept-P	0.95	0.08	0.00
	Linear-P	0.03	0.01	0.06
	Intercept-S	1.87	0.19	0.00
	Linear-S	-0.26	0.05	0.00
	AIC	943.76		
BIC	1036.62			
Entropy	0.77			

Note. Within each group of the three-group piece-wise trajectory model, separate intercept and slope parameters were estimated for the two measurement times in primary school (i.e., grade 4 and grade 6) and for the three measurement times in secondary school (i.e., grade 7, 8, and 9). P denotes the primary school period; S denotes the secondary school period. Quadratic trends were not significant for the Low-Decreasing group and for the High-Increasing-Decreasing group and were thus not estimated in the final model. SE = Standard Error. AIC = Akaike Information Criterion. BIC = Bayesian Information Criterion.

PREDICTORS OF PEER VICTIMIZATION TRAJECTORIES



Supplementary Figure 1. Predicted longitudinal profiles of peer victimization from grade 4 to grade 9 (i.e., age 10 to age 15) based on the three-group piece-wise trajectory model.