Relations between Trajectories of Peer Victimization and Measures of Psychosocial Adjustment

BY

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Abstract

Background: Peer victimization has been consistently associated with a host of negative outcomes including aggression, depressive symptoms, and academic difficulties. However, few studies have examined how individual changes in victimization over time, or trajectories of victimization, are related to these outcomes. *Objectives*: The current study aimed to identify different trajectories of physical and relational victimization in third through fifth grade. Additionally, relations between peer victimization trajectories and a range of psychosocial outcomes, including proactive and reactive aggression, depressive symptoms, and academic difficulties, were examined. Finally, the impact of gender on the associations between trajectories of peer victimization and psychosocial adjustment were considered. *Methods*: Third through fifth grade teachers and students completed study measures over the course of three years resulting in a total sample of 670 elementary school aged youth. *Hypotheses*: Consistent with previous research, four trajectories were expected to emerge from the data. Trajectories characterized by high levels of victimization were expected to be positively associated with reactive aggression, depressive symptoms, and academic difficulties. Finally, victimized boys were expected to exhibit aggressive outcomes, whereas girls were expected to exhibit more depressive symptoms in response to victimization. *Results*: Three trajectories emerged for both physical and relational aggression and for both boys and girls. Intercepts and slopes of victimization remained largely unrelated to all psychosocial outcomes. Gender did not impact relations between trajectories of victimization and psychosocial outcomes. *Conclusions*: The current study suggests that three, similar trajectory groups can be identified between physical and relational victimization in children in 3rd through 5th grade. Findings regarding the relations between psychosocial outcomes and gender are discussed

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Peer victimization, an interpersonal stressor resulting from being the recipient of peers' aggressive behavior, has been identified as a pervasive problem in elementary school, as approximately 60% of elementary school aged youth report being victimized at some point in time (Crick, Casas, & Ku, 1999; Kochenderfer-Ladd & Wardrop, 2001). Peer victimization can be categorized by the form of aggression experienced. Overt victimization refers to experiencing aggressive acts that involve being physically intimidated or verbally threatened (Crick et al., 1999), and relational victimization refers to experiencing aggressive acts that involve the manipulation or damage of one's peer relations or social status (i.e., ostracism, gossip, rumor spreading; Crick & Grotpeter, 1996). A host of negative outcomes across multiple domains of functioning have been associated with peer victimization, including internalizing, externalizing, and academic difficulties (see, Hawker & Boulton, 2000; Reijntjes et al., 2011; Reijntjes, Kamphuis, Prinzie, & Telch, 2010, for review). Given the widespread nature of victimization and the associated risk, peer victimization is a major public health concern. Although there is substantial research examining cross sectional and longitudinal relations between peer victimization and psychosocial consequences, few studies have examined different trajectories of victimization and their associated outcomes.

Evidence suggests that children do not follow the same pattern of victimization throughout elementary school. Some children may experience stable victimization (i.e., chronically victimized, rarely victimized), while others may experience changes in victimization over time, as they may experience increases or decreases in victimization over the course of elementary school (Biggs et. al., 2010; Boivin, Petitclerc, Feng, & Barker, 2010; Lester, Cross, Dooley, & Shaw, 2013). Different victimization trajectories may also be associated with unique

outcomes, differing either in type (i.e., depressive symptoms, aggression) or severity (i.e., mild, moderate, severe; Biggs et. al., 2010; Boivin et al., 2010; Lester et al., 2013). Accordingly, the current study adds to the literature by using growth mixture modeling to identify trajectories of physical and relational forms of victimization from third through fifth grade and to further determine how these trajectories of victimization are differentially associated with a broad range of psychosocial outcomes, including proactive and reactive aggression, depressive symptoms, and academic achievement. Gender differences in these associations are also examined.

Trajectory Analysis

Only a handful of studies have examined relations between victimization and psychosocial outcomes using growth mixture modeling to identify specific patterns of victimization over time. This is an important gap in the literature considering not all children follow the same pattern of victimization, and these different patterns may be associated with different outcomes, varying in type or severity (Biggs et. al., 2010; Boivin et al., 2010; Lester et al., 2013). In an Australian sample of students in seventh to ninth grade, Lester and colleagues (2013) examined the relation between different trajectories of combined physical and relational victimization and anxiety and depressive symptoms. Four separate trajectory groups were identified for males including not bullied, low stable, medium stable, and low increasing groups. Three separate groups were identified for females including not bullied, low stable, and low increasing groups. Children, both male and female, in the low increasing group had higher levels of anxiety and depression scores than children in any other group; however, all children who had been victimized at some point exhibited elevated scores of depression and anxiety (Lester et al., 2013).

Another trajectory analysis conducted by Biggs and colleagues (2010) examined how different patterns of combined physical and relational victimization related to positive and negative affect in a sample of children in third through fifth grade. Growth mixture modeling identified five trajectory subgroups including low, moderate, decreasing, increasing, and chronic subgroups. Overall, more victimization led to increases in negative affect and decreases in positive affect, with the chronically victimized group exhibiting the most affective distress (Biggs et al., 2010).

Boivin and colleagues (2010) conducted a trajectory analysis of children grades 3 through 6. Three developmental trajectories were identified in the dataset including a low stable group, an extreme decreasing group, and a low increasing group. Peers rated children in the extreme decreasing group as more socially withdrawn and emotionally vulnerable. Children in the low increasing group were also perceived to be more socially withdrawn and emotionally vulnerable than the children in the low stable group. Further, children in the extreme decreasing and the high increasing groups were perceived as more aggressive than the children in the nonvictimized group. Interestingly, the victimized groups showed decreases in aggression over time; however, only children in the extreme-decreasing group showed an upward trend in social withdrawal (Boivin et al., 2010). Boys were more likely to be in high victimization trajectories compared to girls. Additionally, they found that boys were more likely to have aggressive outcomes, whereas girls were more likely to be socially withdrawn and emotionally vulnerable than boys (Boivin et al., 2010).

Understanding the trajectory, or pattern of victimization over time, is imperative to understanding the development of mental health outcomes for victimized youth. While much of the literature to date has focused on the how victimization at one point in time relates to

adjustment at another point in time, trajectory analyses can examine how patterns of victimization over time relate to psychosocial outcomes. As not all children follow the same trajectory of victimization, and these patterns are related to different outcomes (Biggs et al., 2010; Boivin et al., 2010; Lester et al., 2013), understanding the typical trajectories of victimization could be particularly important in determining which children are most at risk to experience negative outcomes. Accordingly, the current study extends the literature by identifying trajectories of physical and relational victimization in late elementary school and examining their relation to several developmentally salient outcomes: proactive and reactive aggression, depressive symptoms, and academic difficulties. Based on the research of Lester and colleagues, I expected four groups to emerge from the data, including a not victimized, increasing, decreasing, and chronically victimized group.

Proactive/Reactive Aggression

Researchers commonly distinguish between functions of aggressive behavior, specifically proactive and reactive aggression. Proactive aggression is conceptualized as aggressive acts used to achieve a desired goal (Dodge, 1991; Fite, Rathert, Colder, Lochman, & Wells, 2010). Proactive aggression is commonly associated with social learning theory, such that proactively aggressive children are motivated to engage in antisocial behavior through the anticipation of rewards (Crick & Dodge, 1996). On the other hand, reactive aggression is conceptualized as aggressive acts in response to a perceived threat (Dodge, 1991; Fite et al., 2010). Reactive aggression is typically associated with the frustration aggression hypothesis, which posits that aggressive acts are defensive and guided by anger (Crick & Dodge, 1996; Dodge, 1991).

While peer victimization has been associated with aggressive outcomes in a number of studies (see Reijntjes et al., 2011, for review), little research has been conducted examining the

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specific links between victimization and proactive and reactive aggression subtypes. Pellegrini (1998) suggested that victimization could be associated with increases in both proactive and reactive aggression. He argued that social learning mechanisms, such as modeling and reinforcement, could teach victimized children to be proactively aggressive. Additionally, victimization may increase reactive aggression as victimized children attempt to retaliate against their aggressor (Pellegrini, 1998).

Existing cross-sectional studies indicate that peer victimization is more strongly linked to reactive aggression than proactive aggression (e.g. Poulin & Boilvin, 2000; Schwartz et al., 1998). A handful of studies have also examined the prospective links between peer victimization and proactive and reactive aggression. Lamarche and colleagues (2007) found peer victimization to be unrelated to proactive aggression, whereas peer victimization was positively associated reactive aggression from kindergarten to first grade. However, an examination of bidirectional associations between peer victimization and functions of aggression found that reactive aggression was associated with increases in peer victimization, but not vice versa (Salmivalli & Helteenvuori, 2007). Thus, more research examining these associations is needed. The current study furthers previous research by examining trajectories of physical and relational victimization as they relate to proactive and reactive aggression. Additionally, the current study is the first trajectory analysis to differentiate between proactive and reactive functions of aggression.

Depressive Symptoms

Depressive symptoms in youth can include depressed mood, irritability, diminished interest in activities, and loss of energy (American Psychological Association, 2013; Stringaris, Maughan, Copeland, Costello, & Angold, 2013). Peer victimization has been associated with

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internalizing symptoms, especially depressive symptoms (see Hawker & Boulton, 2000;

Reijntjes et al., 2010, for review). The relation between peer victimization and internalizing

symptoms is likely bidirectional, such that children who are withdrawn and depressed are at an

increased risk to be victimized, which in turn is associated with increases in depressive

symptoms (e.g. Leadbeater & Hoglund, 2009; Snyder et al., 2003). However, some evidence

suggests that the relation between victimization and later internalizing symptoms is somewhat

stronger and more consistently demonstrated in research (Rejntjes et al., 2010; Rudolph, Troop-

Gordon, Hessel, & Schmidt, 2011; Schwartz, Gorman, Nakamoto, & Tobin, 2005). Further,

victimization in youth has been associated with negative self-cognitions, which may contribute

to the development of later depressive symptoms (Cole et al., 2014; Graham & Jovonen, 1998;

Troop-Gordon & Ladd, 2005).

Several longitudinal studies have linked peer victimization to depressive symptoms

across development (Kochenderfer & Ladd, 1996; Rudolph et al., 2011; Schwartz et al., 2005).

For example, in a sample of second through fifth grade children, early and increasing child-rated

peer victimization was significantly related to increases in teacher-rated depressive symptoms.

However, they did not find early depressive symptoms to be related to later victimization

(Rudolph et al., 2011). Previous trajectory analyses have examined outcomes of depressive

symptoms (Lester et al., 2013; Boivin et al., 2010); however, the current study, to my

knowledge, is the first trajectory analysis to examine the relation between trajectories of

victimization and depressive symptoms by form of victimization during late elementary school.

Academic Functioning

Measures of academic achievement can include anything from GPA and achievement

tests to other teacher and self-reported measures. Studies have consistently indicated that high

levels of peer victimization are associated with poor academic performance across different forms of measurement (Berthold & Hoover, 2000; Buhs & Ladd, 2001; Fite, Cooley, Williford, Frazer, & DiPierro, 2014; Ladd, Kochenderfer, & Coleman, 1996; Nakamota & Schwartz, 2010; Olweus, 1978; Perry, Kusel, & Perry, 1988; Sutton, Smith, & Swettenham, 1999). Peer victimization may be related to disruptions in the learning process, as children may become distracted or distressed by negative peer interactions (Jovonen, Nishina, & Graham, 2000; Schwartz et al., 2005). Other studies have found peer victimization to increase absenteeism, which may also lead to deficits in academic functioning (Kochenderfer & Ladd, 1996; Nishina, Juvonen, & Witkow, 2005). The current study extends previous research by examining how different trajectories of victimization over time may relate to academic difficulties while taking into account different forms of victimization.

Gender

Gender may also be associated with differences in victimization experiences as well as response to victimization. Research has most consistently demonstrated that boys are more likely to experience physical or overt forms of victimization (Crick & Bigbee, 1998; Rose & Rudolph, 2006). Some studies have also suggested that girls are more likely to experience relational forms of victimization (e.g. Crick & Bigbee, 1998); however, this relation is more inconsistent (Rose & Rudolph, 2006; Underwood, 2003). Fewer studies have examined the differential effects of victimization for boys and girls. A handful of studies have found that victimization is more likely to lead to emotional distress in girls (Bond, Carlin, Thomas, Rubin, & Patton, 2001; Lopez & DeBois, 2005; Rose & Rudolph, 2006; Rudolph, 2002), and other studies have suggested the boys' exposure to physical forms of victimization may be related to increases in aggressive responses to victimization (Rose & Rudolph, 2006).

Some studies have examined the effects of gender on these associations using trajectory analyses. Using a measure that primarily assessed for physical aggression, Boivin and colleagues (2010) found that boys were more likely to be in high victimization trajectories and display aggressive outcomes, while girls were more likely to be socially withdrawn and emotionally vulnerable. However, Biggs and colleagues (2010) found that boys were more likely to respond to victimization experiences with negative emotions than girls. Lester and colleagues (2013) found boys to report higher levels of victimization than girls. Accordingly, gender differences in peer victimization trajectories and outcomes were examined.

The Current Study

The current study used growth mixture modeling to identify patterns of child-reported victimization in a sample of elementary school aged youth in third to fifth grade. The aims of this study are threefold: (a) to identify different trajectories of physical and relational victimization, (b) to examine how different trajectories of victimization relate to a range of psychosocial outcomes including proactive and reactive aggression, depressive symptoms, and academic difficulties, and (c) to examine differences in peer victimization trajectories and outcomes by gender. Consistent with previous research (Lester et al., 2013) and allowing for the identification of increasing, decreasing, not victimized, and chronically victimized groups, it was hypothesized that four subgroups of victimization would emerge from the data, with most children experiencing little to no victimization and very few children experiencing chronically high levels of victimization. It was further hypothesized that the more victimized groups would exhibit more reactive aggression, depressive symptoms, and academic difficulties, such that chronically victimized children were expected to have the worst outcomes. Trajectories of victimization were not expected to be associated with proactive aggression. Similar patterns of trajectories

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were expected to emerge for physical and relational forms of aggression, as well as for boys and girls. However, boys were expected to experience higher levels of physical victimization than girls; whereas girls and boys were expected to experience similar levels of relational victimization. Boys were expected to be more aggressive in response to victimization, whereas girls were expected to exhibit more depressive symptoms. However, no hypotheses were specified in regards to the effects of gender in the relation between peer victimization and academic difficulties.

Methods

Participants

Participants included third through fifth grade students and teachers recruited across three years from an elementary school in a small, Midwestern community (see Table 1). Homeroom teachers reported on the students in their class at each of three time points. At baseline (Time 1), all 18 teachers in the third through fifth grade reported on all 360 students in their classrooms. Additionally, at Time 1, 221 students completed self- reported measures. At one year follow up (Time 2), all 17 teachers in the third through fifth grade participated, collecting data on all 384 students in their classrooms. At Time 2, 279 students participated. Finally, at two-year follow up (Time 3), all 17 of the third through fifth grade teachers again participated. Teachers answered questions on all 375 students in their classrooms. At Time 3, 295 students participated in data collection. Teachers reported on 100% of their students at each time point. See Table 2 for a complete breakdown of participants in each cohort.

Missing data were due mainly to students moving out of the district. Of the students who completed surveys at Time 1, 45 did not complete surveys at Time 2; and, of the students who completed surveys at Time 2, 31 did not complete surveys at Time 3. Teachers did not report on

25 students at Time 2 that they reported on at Time 1. Further, teachers did not report on 24 students at Time 3 that they reported on at Time 2. New students beginning their participation at Time 2 and Time 3 were included in analysis. Thus, 65 additional students completed surveys at Time 2, and an additional 40 students participated at Time 3. Teachers reported on 38 additional students at Time 2, and they reported on an additional 18 students at Time 3. Note that one student moved in and out of the district over the three-year time period. Accordingly, a total of 670 students were included in data analysis.

School records indicate that the school was predominantly Caucasian, as less than 20% of the student body identified as a racial/ethnic minority. Approximately half of the participants were female (49.9%). Socioeconomic information was not available for the participants; however, approximately 35% of the students in the school were eligible for free or reduced lunch.

Measures

Demographics. Teachers reported on students' gender (male/female) and grade level (third through fifth).

Peer victimization. Student-reported victimization was measured using the Victimization of Self subscale of the Peer Experiences Questionnaire. The Victimization of Self subscale was adapted from prior victimization literature (Dill, et al., 2004; Vernberg, Jacobs, & Hershberger, 1999) and has been used in previous trajectory research (e.g., Biggs et al., 2010). Students were prompted to consider their experiences since the start of school using nine items. Four items examined overt (e.g., "A kid hit, kicked, or pushed me in a mean way") forms of victimization, and five items examined relational (e.g., "Some kids left me out of things just to be mean to me") forms of victimization. Students answered these questions using a 5-point Likert scale evaluating

the frequency of victimization experiences (1 = never, 5 = a few times a week). Mean scores were calculated such that higher scores indicated increased levels of victimization. This measure demonstrated good reliability across each wave of data for both overt (.76, .85, and .71) and relational (.86, .91, and .83) victimization.

Proactive and reactive aggression. Teachers reported on students' levels of proactive and reactive aggression using Dodge and Coie's (1987) measure. Previous studies have found this measure to be reliable and valid when reported by teachers (Dodge & Coie, 1987; Waschbusch, Willoughby, & Pelham, 1998). Three items of the scale were used to assess proactive aggression (e.g., "When the child has been teased or threatened, s/he gets angry easily and strikes back"), and three items were used to assess reactive aggression (e.g., "The child gets other kids to gang up on somebody that s/he doesn't like"). Teachers responded using a 5-point Likert scale (1 = never, 5 = almost always). Mean scores were calculated for each subscale, with higher scores indicating higher levels of proactive or reactive aggression. Subscales of both proactive (.85, .87, and .78) and reactive (.92, .95, and .95) aggression demonstrated good internal consistency across all waves of data.

Depressive symptoms. Teacher-reported depressive symptoms were assessed using the withdrawn and depressed subscale of the Teacher Report Form (TRF; Achenbach & Rescorla, 2001). The TRF has been shown to be a reliable and valid measure of childhood internalizing symptoms (Achenbach & Rescorla, 2001; Hoge & McKay, 1986). Further, teachers are often asked to report of child internalizing behavior during clinical assessment, thus teacher reports of internalizing symptoms are appropriate to inform intervention efforts. Teachers responded to eight items using a three point Likert scale (1 = Not True, 2 = Somewhat or Sometimes True, 3 =

Very or Often True). Mean scores were calculated such that higher scores indicated higher levels of depressive symptoms. Reliability was good across all time points (.87, .87, and .88).

Academic difficulties. Teachers rated three different items regarding their students' academic performance. First, they were asked, "How does this child perform academically relative to other students in your class?" Second, they were asked, "When thinking about this student how would you describe their overall academic performance (reputation based on all of their classes)?" Each of these items was rated using a 5-point Likert scale (1 = Well Below Average, 5 = Well Above Average"). Third, teachers were asked to provide a letter grade reflecting the overall academic performance for each student in the class (A, B, C, D, or F). Higher letter grades correspond to higher academic performance (1 = "F", 5 = "A"). An academic performance score was calculated by averaging aforementioned questions. Thus, overall high scores indicated higher levels of academic performance. This measure has been used in previous studies to assess academic functioning (e.g. Becker, Fite, Vitulano, Rubens, Evans, & Cooley, 2014, Fite et al., 2014). The internal consistency was good across all time points (.94, .95, and .96)

Procedures

Both the researcher's Institutional Review Board and the school's administration provided approval for this study. Prior to participation at each time point, teachers provided written consent. Teachers were then asked to complete a survey using Qualtrics online survey software. Data collection began approximately two months into the fall semester across all three time points. Teachers were provided one month to complete the survey. At each time point, participating teachers were asked to complete a 10-minute survey on each of the students in their

classroom. At Time 1, teachers received $7 compensation for each completed survey. At both Time 2 and Time 3, teachers received $50 for the completion of surveys for the entire class.

Student data were also collected approximately 10 weeks into the fall semester across all waves of data. Data collection took place in the students' regular classroom, and only students whose parents provided written consent remained in the classroom. Prior to their participation at each time point, students were required to provide verbal assent. Self- reported measures were administered to study participants over the course of 30 minutes. Two to four trained research team members collected data in each classroom. One research team member read the standardized instructions and questions out loud to ensure comprehension. Other team members circulated throughout the room to answer questions and make sure that the students were keeping pace as the questions were being read. No school personnel were allowed in the classroom during data collection to ensure confidentially and increase accuracy in reporting. Classrooms were compensated for their time and effort at Time 1 by receiving a $75 gift card. Classrooms were compensated $50 at Time 2, but were not compensated at Time 3 due to limitations in the study funds. However, at Time 3, students were given a mechanical pencil after completing their survey.

Data Analysis Plan

Analyses were conducted using Mplus version 7.0 software. Diagnostics of study variables were conducted in order to evaluate non-normality of the data prior to fitting models. An accelerated longitudinal design was used to maximize the number of study participants, such that participants with any data at any time point were included in analysis. Traditional longitudinal designs analyze one set, or cohort, of individuals beginning data collection at the same initial time point and at the same age, and then assess for changes over *time points*.

Accelerated longitudinal designs analyze multiple cohorts beginning at the same initial time point but at different ages and then assess for changes over *ages* (see Figure 1; Galbraith, Bowden, & Mander, 2014). Thus, the current study evaluated data by grade, rather than by year of data collection, such that data gathered over the course of three years was collapsed by grade for analysis. Use of the accelerated longitudinal design is consistent with previous research using growth mixture modeling (e.g., Biggs, et al., 2010; Boivin et al., 2010).

Due to the nature of the study design, both planned (e.g., years when data were not available) and unplanned (e.g., students moving out of the district) missingness were represented in the dataset. The current data set contains 52% planned and unplanned missing data. While Full Information Maximum Likelihood (FIML) was originally proposed for analysis due to the robustness of the procedure, limitations of MPlus software would not allow for the use of FIML estimation while conducting trajectory analysis. Accordingly, multiple imputation was used to account for planned and unplanned missingness. As opposed to FIML which estimates model parameters (Arbuckle, 1996; Wothke, 2000), multiple imputation uses available data to estimate individual scores within the dataset, and these scores are then estimated across multiple replicated datasets. Scores generated in these datasets are then aggregated during model analysis, creating unbiased estimates for model parameters (Sinharay, Stern, & Russell, 2001; Little, Jorgensen, Lang, & Moore, 2014). Similar to FIML, multiple imputation significantly outperforms listwise and pairwise deletion in creating unbiased estimates for model parameters (Newman, 2003). Further, multiple imputation performs similarly well when compared to FIML (Graham, Olchowski, & Gilreath, 2007; Newman, 2003). Simulation research suggests that given a missing data rate of 52%, 40 imputed datasets need to be created in order to maintain similar power as generated by FIML and obtain accurate parameter estimates (Graham et al., 2007).

Accordingly, the present study created 100 datasets from which to aggregate parameter estimates in order to maintain adequate power and accurate estimates, and further allowing for the entire dataset of 670 participants to be utilized for analysis.

Growth mixture modeling was used to estimate different trajectory groups. Growth mixture modeling is a type of latent growth curve that identifies unobserved trajectory groups within a dataset, such that different subgroups are allowed to emerge from the dataset (Ram & Grimm, 2009; Wang & Bodner, 2007). Two separate models were fitted with one model examining physical victimization and another examining relational victimization. To begin analysis for either model, a single-group growth model was fitted to the data to establish a baseline representation of change. Subsequent models were specified using an increasing number of groups. Using start values generated during the initial latent growth curve model, 2 through 5 group victimization trajectory models were specified in order to determine the model that best fit the data. Next, physical and relational victimization trajectory models were specified for both boys and girls to determine if patterns remained the same across gender. Although only 3 through 5 group models were first proposed, 2 group models were specified when it appeared that 3 group models may best characterize the sample, in order to adequately compare goodness-of-fit (Ram & Grimm, 2009). Models were examined for good fit using the Bayesian Information Criteria (BIC) and Akailke Information Criteria (AIC), in which lower numbers indicate better fitting models (Muthen, 2003; Nylund, Asparouhov, & Muthen, 2007; Ram & Grimm, 2009; Wang & Bodner, 2007). Entropy was also used to make model-fitting decisions, as it indicates the confidence of group membership (Ram & Grimm, 2009). Finally, theoretical underpinnings were considered in determining the model's sensibility and ultimate selection.

Following model selection, functions of aggression, depressive symptoms, and academic difficulties variables were added to the model individually in order to determine how different trajectories are associated with individual outcomes. Unlike the proposed model, class membership could not be related to outcomes directly, as these models would not converge. To compensate, the intercept and slope of each trajectory group were related to outcomes individually, in order to detect patterns of associations between the characteristics of each trajectory group and psychosocial outcomes (see Figure 2). Each outcome variable was controlled for at grade 3 in the analysis. Thus, outcome variables represented change in outcome over the three-year period (3rd through 5th grade).

Gender was first included as a covariate to determine the effect of gender on trajectory group membership. Unfortunately, the moderation of gender between trajectories of victimization and outcomes was not possible to complete as proposed due to previously discussed difficulty relating class membership to outcomes. Further, gender could not be added as a moderator to the relation between intercept and slope and psychosocial outcomes, as moderation cannot be tested between latent variables and outcomes due to limitations in software. Further, multiple group analysis could not be conducted; similarly due to limitations in software, as mixture modeling cannot be adapted to multiple group analysis. However, in order to further understand patterns of association between gender and trajectories of physical and relational victimization, two models (one for females and one for males) were run for physical and relational victimization respectively.

Power is difficult to estimate when considering latent growth curve models and may not be feasible, as many factors such as sample size, size of effect, growth curve reliability, number of repeated measures, and degrees of freedom need be considered (Duncan & Duncan, 2004;

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Preacher, Wichman, MacCallum, & Briggs, 2008; von Oertzen & Brandmaier, 2013). However, latent growth models, including growth mixture modeling, have been determined to possess increased statistical power over other comparable longitudinal methods (Curran, Obeidat, & Losardo, 2010). Further, it has been proposed that the number of observations can add additional power to longitudinal studies (Curran et al., 2010; Muthen & Curran, 1997). Thus, the three time points used in the current study were expected to increase the power to detect effects, as the total sample size (n = 670) had observations at three time points, making 2,010 total person x time observations. Additionally, other studies utilizing growth mixture modeling have used smaller sample sizes than that of the current study and were able to identify subgroups within their sample (e.g. Czyz & King, 2015; Mackie, Castellanos-Ryan, & Conrod, 2011). Taken together, this suggests that the current study was adequately powered to detect effects.

Results

Diagnostics

First, diagnostics of study variables were completed in order to evaluate for skewness and kurtosis beyond what could be accommodated by maximum likelihood estimation as well as determine simple relations between variables. See Table 3 for means, standard deviations, skewness, kurtosis, and correlations among study variables. Most values remained within the bounds of normality (3), with the exception of proactive aggression in 3rd grade (3.46), suggesting that skewness did not need to be corrected (Kline, 2005). Further, values for kurtosis only slightly exceeded recommendations of 10 for peer victimization in 4th grade (11.15) and proactive aggression in 3rd grade (13.73), suggesting that kurtosis was not a problem in the current sample (Kline, 2005). It should be noted that while some corrective procedures could be used to adjust estimates for these values, these corrections make it more difficult to detect

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trajectory groups with small sample sizes (Muthen & Asparouhov, 2015). Accordingly, residual non-normality was not corrected for in the current sample.

In correlational analyses (see Table 3), physical victimization in grade 3 was significantly positively related to physical victimization in grade 4, and physical victimization in grade 4 was significantly positively related to physical victimization in grade 5. Further, physical victimization in grade 3 was significantly positively related to relational victimization in grades 3 and 4; physical victimization in fourth grade was significantly positively related to relational victimization in grades 3, 4 and 5; and physical victimization in grade 5 was related to relational victimization in grades 4 and 5. Relational aggression in grade 3 was significantly positively associated with relational victimization in grade 4, and relational aggression in grade 4 was significantly positively associated with relational victimization in grade 5. Gender was significantly associated with physical victimization in third and fourth grade, such that boys were more likely to be physically victimized. Gender was unrelated to relational victimization.

In regards to outcomes of psychosocial adjustment, physical and relational victimization in grade 3 were positively related to proactive aggression in third and fifth grade, while physical and relational victimization in grade 5 was positively related to proactive aggression in fifth grade. Physical victimization in third, fourth, and fifth grade were significantly positively related to reactive aggression in third grade. Only physical victimization in grade 5 was significantly positively related to reactive aggression in the fifth grade. Relational victimization in the third and fifth grade was positively related to reactive aggression in grade 3, and relational victimization in grade 5 was positively associated with reactive aggression in grade 5. Physical and relational victimization were unrelated to depressive symptoms across grade levels. Finally, physical and relational victimization in grade 3 was associated with academic difficulties in

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grade 3. Physical and relational victimization in grade 4 and physical victimization in grade 5 were associated with academic difficulties in the fifth grade. Associations with academic difficulties were such that high levels of victimization were associated with low academic performance. Gender was associated with proactive aggression in grade 3 and reactive aggression in grade 3 and grade 5, such that boys were more likely to engage in proactive and reactive aggression at the specified grade levels.

Latent Growth Curve

First, a single latent growth curve was estimated in order to establish a pattern over time, regardless of group membership, for both physical and relational victimization. To assess goodness of fit for latent growth curves a Root Mean Square of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) of .06, .95, and .95 respectively are considered acceptable model fit (Hooper, Coughlan, & Mullen, 2008). For the physical victimization latent growth model, model fit indices demonstrated poor model fit using traditional fit indices (χ^2 = 21.710; RMSEA = 0.11; CFI = 0.57; TLI = -0.30). Accordingly, these results suggest that a singular linear growth curve does not adequately capture the pattern of change across grades. The intercept was significantly different than zero; however, the slope was not significant, suggesting no changes in physical victimization across grades (See Table 4).

Similar to the latent growth curve for physical victimization, model fit indices for the relational latent growth curve also demonstrated poor model fit (χ^2 = 7.76; RMSEA = 0.10; CFI = 0.72; TLI = 0.160; thus, fit indices suggest that a singular linear growth curve does not adequately capture the pattern of change across grades. Comparable to the physical victimization latent growth curve, while the intercept was significantly different than zero for the relational victimization latent growth curve, the change in victimization from third to fifth grade was not

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significantly different than zero, suggesting no change in relational victimization across grades (See Table 4).

Mixture Modeling

Next, models were specified using different specifications of trajectory groups for physical and relational victimization respectively (see Table 5). The three group trajectory model appeared to provide the best fit for the data, according to model fit indices (i.e., AIC, BIC), entropy, and substantive theory. The four group model did not demonstrate substantially better model fit and added an additional group inconsistent with theory that did not appear to be meaningful. Figure 3 illustrates trajectory groups for the physical victimization three group mixture model. The largest trajectory, comprising approximately 92% of the sample (n = 615), is characterized of low levels of physical victimization across grade levels, making a not victimized group. Levels of physical victimization in the not victimized group remained below one unit and only slightly decreased by 0.12 units from grade 3 to grade 5. The second trajectory group, comprising approximately 6% of the sample (n = 38), displayed a decreasing trajectory across grade levels, decreasing by 1.70 units from grade 3 to grade 5. Finally, the smallest trajectory included approximately 3% of the sample (n = 17) and is characterized by an increasing trajectory of physical victimization across grades, increasing by 1.73 units from third to fifth grade.

For relational victimization, 2 through 5 trajectory group models were specified (see Table 5). Similar to the physical victimization model, the three group trajectory model best characterized the patterns of relational victimization in the sample according to model fit indices, entropy, and theory. Additionally, the four group model did not provide substantially better model fit while also adding a group that did not appear to be meaningful and did not fit into

existing theory. Figure 4 illustrates trajectory groups for the relational victimization three group mixture model. The largest trajectory group included approximately 90% of the sample (n = 603). Consistently low levels of relational victimization from 3rd to 5th grade characterized this group such that there were no changes in level of victimization from grade 3 to grade 5, creating a not victimized group. The second trajectory group included approximately 7% of the sample (n = 47) and followed a declining trajectory across grades, decreasing by 1.92 units from grade 3 to grade 5. Finally, the smallest group, comprising approximately 3% of the sample (n = 20), is characterized by an increasing trajectory across grades, increasing by 1.76 units from third to fifth grade.

Differing trajectories were specified for physical and relational victimization depending on status as a boy or girl (see Table 6). The three-group physical victimization trajectory model appeared to best fit the data, according to model fit indices, entropy, and substantive theory for both boys and girls. Only slight differences in the proportion of youth falling into each trajectory was evident. While low levels of victimization across grades (not victimized) characterized the largest group for both boys (93%) and girls (90%), slightly more girls (7%) fell into the increasing trajectory than boys (2%). The same proportion of boys and girls (4%) fell into the decreasing trajectory group. The three-group model also appeared to best fit the trajectories of relational aggression for both boys and girls. Similar to trajectory groups for the overall model, the largest group was a not victimized group (90%; 89%, respectively), followed by the decreasing group (7%; 7%, respectively), and the smallest group was the increasing group (3%; 4% respectively). These models suggest no marked difference between boys and girls in patterns of trajectories. Accordingly, the overall models, in which boys and girls were included in the same model, were used for further analysis.

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Psychosocial Outcomes

Next, outcomes were added to the physical and relational trajectory analysis in separate models in order to understand unique relations between trajectory groups and outcomes. While controlling for grade 3 levels of outcome variables, no significant relationships were detected between the intercepts and slopes of any physical victimization trajectory group and outcome. Similarly, no significant relationships were identified between intercepts and slopes of the relational victimization trajectory groups and proactive and reactive aggression, depressive symptoms, or academic difficulties (see Table 7). Accordingly, neither initial levels of victimization nor changes in victimization over time were related to changes in proactive and reactive aggression, depressive symptoms, or academic difficulties. Thus, findings suggest that no pattern of either physical or relational victimization is related to changes psychosocial adjustment from 3rd to 5th grade.

Gender

Gender was added as a covariate to determine if gender was significantly related to trajectory group characteristics (i.e., intercept, slope) and indicators of psychosocial adjustment. Gender was significantly related to both the initial levels of physical victimization (lambda = -.93, p = .01) and changes in physical victimization across grades (lambda = .48, p = .04) in the decreasing trajectory group (Figure 2, Class 3). Findings are such that boys had higher levels of initial physical victimization, while girls experienced greater decreases in physical victimization across grades. No significant relations were found between gender and outcomes, including proactive and reactive aggression, depressive symptoms, and academic difficulties in the physical victimization model. Further, no significant associations were found between relational victimization trajectories or outcomes and gender in the relational victimization model.

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No differing patterns of association were found between slopes and intercepts of trajectories groups for physical victimization between boys and girls. One differing association emerged for the relational aggression models, such that for the increasing trajectory (Figure 3; Class 1), higher initial levels of relational victimization were associated with decreases in reactive aggression in the 5th grade for males (lambda = -2.48, p = .05) but not for females (lambda = -0.54, p = .76).

<div align="center">Discussion</div>

The current study examined patterns of physical and relational victimization from third through fifth grade using growth mixture modeling. Trajectory models were used to determine how differing patterns of victimization relate to indicators of psychosocial adjustment, including proactive and reactive aggression, depressive symptoms, and academic difficulties in the fifth grade. The effect of gender was also tested as it related to trajectories of victimization and psychosocial adjustment. This study extended previous research by examining the patterns of victimization that may emerge for both physical and relational victimization distinctly. Further, research was extended by examining the associations between these trajectories of physical and relational forms of victimization and indicators of psychosocial adjustment in late elementary school.

As expected, distinct trajectory groups were identified for both physical and relational victimization. Four groups were expected as this number was consistent with previous literature (Lester et al., 2013) and allowed for the identification of increasing, decreasing, not victimized, and chronically victimized groups. However, three, rather than four, trajectory groups were identified within the current sample, as four group models of physical and relational victimization added an additional group that was inconsistent with theory while also failing to

<div align="center">23</div>

add additional meaning to the model. Interestingly, models identifying three victimization

trajectories replicated results from Boivin and colleagues (2010), who similarly found three

trajectory groups using a measure primarily assessing for physical victimization. Specifically, for

both physical and relational victimization, a not victimized group, an increasingly victimized

group, and a decreasingly victimized group were identified. The number and features of

trajectories remained the same between boys and girls. The largest trajectory group was the not

victimized group, comprising approximately 92% to 90% of the sample, for both physical and

relational victimization respectively. Further, the decreasing victimization group was the second

largest group (6%, 7%, respectively), while the increasing group was the smallest victimization

group for both physical (3%) and relational victimization (3%).

Proportions of students within each trajectory group were also consistent with previous

research. Boivin and colleagues (2010) similarly identified that 85.5% of their sample fell into a

rarely victimized group, while 4.5% of the sample fell into the decreasing group and 10% fell

into the increasing group. Other studies that utilizing trajectory analyses indicated that not

victimized (56.2%; Biggs et al., 2010) and rarely victimized (52%; Lester et al., 2013) groups

were the largest in their sample. Although these studies implicated a smaller proportion of their

sample into the not victimized group, this might be expected given that they identified more than

three groups in their sample (Biggs et al., 2010; Lester et al., 2013). Biggs and colleagues (2010)

also identified decreasing (5.90%) and increasing (4.04%) groups, with proportions similar to the

current study. In contrast, Lester and colleagues (2013) did not identify a decreasing group,

although their increasing group consisted of 4% of the sample. It might be expected that similar

groups would be identified between the current study and Boivin and colleagues (2010) and

Biggs and colleagues (2010) as they utilized a similar a age range (3rd through 6th grade and 3rd

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through 5th grade, respectively), while Lester and colleagues used and older sample of youth in grades 7 through 9.

While growth mixture modeling is an exploratory approach to data analysis, as identified groups are artifacts of the data, replications of these finding provide additional support that similar groups of students are likely to be identified in a variety of elementary school settings. Further, while other trajectory analyses using elementary school age samples identified more groups, namely containing a chronically victimized trajectory, characterized by high levels of victimization over time, and a moderately victimized group (Biggs et al., 2010), they also found similar not victimized, increasing, and decreasing groups (Biggs et al., 2010; Boivin et al., 2010). Accordingly, there is some support for the broad identification of these groups of physical victimization in elementary school settings.

Similar conclusions cannot be drawn regarding relational victimization, as I believe this is the first growth mixture modeling analysis to examine relational victimization specifically. Interestingly, similar trajectories of victimization and proportions of group membership were identified for both physical and relational victimization. Further, neither trajectory for physical or relational victimization was related to differing outcomes of proactive and reactive aggression, depressive symptoms, or academic difficulties. While a gender difference was noted in the current study in regards to the decreasing group of physical victimization, the effect of gender did not appear to differentiate between physical and relational forms victimization and outcomes. These findings are consistent with other studies that have demonstrated the limited differences between physical and relational victimization, in that children commonly view themselves as being victims of both physical and relational victimization (Felix & MacMahon, 2007; Nylund, Bellmore, Nishina, & Graham, 2007). Further, other studies have shown that physical and

relational victimization result in similar short and long-term adjustment outcomes (Nishina &

Juvonen, 2005; Rudolph et al., 2011; Rudolphet al., 2014). Research should continue to examine

distinctions between physical and relational victimization and outcomes as well as the effects of

gender. However, the current study does suggest that patterns in initial levels and changes in

victimization from third to fifth grade are not drastically different between physical and

relational forms of victimization.

Interestingly, no trajectory of victimization with the overall sample, either for physical or

relational victimization, was associated with changes in proactive and reactive aggression,

depressive symptoms, or academic difficulties. Consistent with expectations, changes in

proactive aggression did not result for different trajectories of victimization. However, contrary

to expectations, trajectories of victimization did not differentially relate to reactive aggression,

depressive symptoms, or academic difficulties. These finding run contrary to previous studies

establishing a link between victimization and reactive aggression, depressive symptoms, and

academic difficulties (e.g., Hawker & Boulton, 2000; Reijntjes et al., 2011; Reijntjes, Kamphuis,

Prinzie, & Telch, 2010) as well as other trajectory analyses which have established differential

relations between trajectories of victimization and aggressive and depressive outcomes (Boivin

et al., 2010; Lester et al., 2013).

It could be that the current study was underpowered. While there was significant support

for the use of these analyses with the current sample size, given the number of observations

(Curran et al., 2010; Muthen & Curran, 1997) and the use of smaller sample sizes in other studies

(e.g. Czyz & King, 2015; Mackie, Castellanos-Ryan, & Conrod, 2011), the lack of significant

findings is surprising and contradictory to prevailing theory. It may be that while there was

enough power to detect distinct trajectory groups, relating these groups to outcomes was more

than the sample size could allow. Given that a majority of the sample remained in the not victimized group, differential relations between outcomes and the smaller trajectory groups could have become statistically tenuous. Further support for this notion is that other studies examining trajectories of victimization and outcomes involved larger sample sizes, usually containing approximately 1,000 students (Biggs et al., 2010; Boivin et al., 2010; Lester et al., 2013); thus, even the smallest trajectory groups, which included approximately 30, 33, and 40 students respectively, may have included enough participants to detect effects.

Issues with power could have been further compounded by the limited variability in study outcomes, with means indicating that the average response was low on the scale with relatively small standard deviations for all outcome measures. Accordingly, the restricted range of scores could have made it difficult to relate trajectories to outcomes. Indeed, prior trajectory analyses examining depressive symptoms were in a sample of 7th to 9th grade students (Lester et al., 2013). Depressive symptoms are relatively low in younger children when compared to older children (e.g., Weis & Garber, 2003); thus, it could be that depressive symptoms did not reach meaningfully high levels in the current sample. Accordingly, future studies should continue to examine how different trajectories of victimization relate to proactive and reactive aggression, depressive symptoms, and academic difficulties using larger samples with more variability.

Other factors may have contributed to the nonsignificant findings. In particular, given the timing of assessments and the measure of victimization used, a relatively small number of victimization experiences may have been captured. Assessments occurred approximately two months into the semester with students prompted to consider only their victimization experiences since the beginning of school. It could be that victimization experiences did not occur often as children are still becoming familiar with each other since the start of school. Additionally,

psychosocial adjustment outcomes may not have been fully realized, as students may have benefited from a reprieve following summer break. As it was expected that a chronically victimized group would experience the most negative outcomes, the timing of assessments and the measure of peer victimization used may have impacted associations, such that expected associations were not found. Finally, the school was implementing a universal social-emotional curriculum with anti-bullying components. Thus, the program may be effective in stalling the development of a chronically victimized group as well as mitigating poor psychosocial adjustment.

Only one statistically significant finding emerged, which suggested that for males, higher initial levels of relational victimization in the third grade were associated with lower levels of reactive aggression in the fifth grade. It could be that males experiencing high initial levels of relational victimization learn over time to reduce aggressive outbursts. However, it should be noted that the effect was only marginally significant ($p = .05$). Considering the number of analyses conducted, this finding should be interpreted with caution, and replication of this finding is necessary to draw definitive conclusions.

Gender appeared to contribute to some relations between variables. Specifically, for the decreasing group of physical victimization, boys had higher levels of initial victimization, while girls demonstrated steeper decreases in victimization across grades. It could be that boys are more likely to be physically victimized than girls over time, such that boys experience higher levels of physical victimization that are slightly more stable than physical victimization patterns for girls, although still decreasing over time. Indeed, while research is in contention regarding experiences of relational victimization (Rose & Rudulph, 2006), studies have found that boys are more likely to experience physical victimization than girls (Crick & Bigbee, 1998; Rose &

Rudolph, 2006). Accordingly, groups showing decreases in physical victimization over time may be more susceptible to the effects of gender.

Findings of the current study should be considered in light of its limitations. First, as previously discussed, the current study may be underpowered to detect effects given the relatively small number of students in the increasing and decreasing groups and lack of variability in outcomes. Accordingly, future studies should continue to examine these relations using a larger sample size with more variability in outcomes. Second, as growth mixture modeling is an exploratory approach, the findings from the current study may not be generalizable to the population or students in other age groups. While consistent with some previous growth mixture models, research should continue to examine trajectories of victimization to determine if they are present across samples and if they are meaningfully and differentially related to indicators of psychosocial adjustment. Third, while consistent with previous research and the analytical methods being used, the current study had a large amount of missing data. Other studies should attempt to minimize the amount of missing data. Fourth, although the current study examined proactive and reactive aggression, depressive symptoms, and academic difficulties as outcomes of peer victimization, these factors could also be examined as predictors (e.g, Leadbeater & Hoglund, 2009; Schwartz et al., 1998). Future studies should examine these factors as predictors for trajectories of physical and relational victimization in order to provide better understanding of the possible bidirectional associations between these variables. Fifth, while the use of teacher reported symptoms might be clinically relevant, children may be the best reporters of their depressive symptoms (e.g., Epkins, 1993). Thus, future studies should consider the use of self-reported depressive symptoms among students. Sixth, as previously noted, the measure of peer victimization prompted youth to consider experiences

since the beginning of school. As these assessments occurred within approximately two months following the beginning of school, the current study obtained a limited number of victimization experiences that may not have been indicative of the entire school year. Future study should use alternative timeframes of measurement, which may lend themselves to the identification of a chronically victimized group and capture a wider range of victimization experiences. Finally, the measure of academic difficulties is unstandardized, as they are based on teachers' perceptions of students' performance. Other studies should consider standardized forms of measurement, such as GPA, in order to provide a more objective standard of measurement. Additionally, future studies should consider the gender of the perpetrator of victimization experiences in order to further extrapolate the effect of gender in these associations.

The current study examined trajectories of victimization between physical and relational victimization in late elementary school and related these trajectories to psychosocial outcomes including proactive and reactive aggression, depressive symptoms, and academic difficulties. Overall, findings suggest that for this age range, a majority of students experience low levels of victimization across grades, while other students experience increasing or decreasing levels of victimization. Interestingly, there is little difference between physical and relational forms of victimization in regards to trajectories or differential outcomes, even when taking into account gender. While the current study may be underpowered to detect associations between trajectories and outcomes, the low rates of these behaviors, both in the current sample and in this age range, may contribute to the lack of significant findings. Finally, gender did not appear to relate to different relations between trajectory groups and psychosocial outcomes.

These finding have further implications for interventions designed to target bullying and victimization in school. Most interventions for peer victimization utilize a school wide approach,

with components that can include parent involvement, teacher training, and bystander interventions (Evans, Fraser, & Cotter, 2014). Findings from the current study suggest that in order for these interventions to be effective, the form of victimization (i.e., physical, relational) and gender of the youth may not require special consideration in late elementary school, as differences between forms of victimization and gender in the current study were minimal. Thus, the use of universal interventions may be best suited for late elementary school aged students. Additionally, findings from the current study illuminate the importance of peer victimization interventions in elementary school as potentially preventative to chronic victimization and poor psychosocial adjustment in middle and high school. It could be that effective interventions in elementary school could prevent the development of a chronically victimized group, as a chronically victimized group has not been reliably identified in late elementary school (i.e., Boivin et al., 2010). Further, while limited power could explain nonsignificant results between victimization and psychosocial outcomes, it could also be that in elementary school, the effects of peer victimization, including aggression, depression, and academic difficulties, may not be fully developed. Thus, interventions in this age group may be preventative to the negative effects of peer victimization.

References

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont Department of Psychiatry.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling* (pp. 243-277). Mahwah, NJ: Erlbaum.

Bauer, D.J. (2007). Observations on the use of growth mixture models in psychological research. *Multivariate Beharioral Research*, 42, 757–786.

Bauer, D.J., & Curran, P.J. (2003). Distributional assumptions of growth mixture models: Implications for overextraction of Latent trajectory classes. *Psychological Methods*, 8, 338–363.

Becker, S. P., Fite, P. J., Vitulano, M. L., Rubens, S. L., Evans, S. C., & Cooley, J. C. (2014). Examining anxiety and depression as moderators of the associations between ADHD symptoms and academic and social problems in Hispanic adolescents. *Journal of Psychopathology and Behavioral Assessment, 36*(2), 265-275.

Berthold, K. A., & Hoover, J. H. (2000). Correlates of bullying and victimization among intermediate students in the Midwestern USA. *School Psychology International, 21*, 65–78.

Biggs, B. K., Vernberg, E., Little, T. D., Dill, E. J., Fonagy, P., & Twemlow, S. W. (2010). Peer victimization trajectories and their association with children's affect in late elementary school. *International Journal of Behavioral Development, 34*(2), 136-146.

Boivin, M., Petitclerc, A., Feng, B., & Barker, E. D. (2010). The developmental trajectories of

    peer victimization in middle to late childhood and the changing nature of their behavioral

    correlates. *Merrill-Palmer Quarterly, 56*(3), 231-260.

Bond, M. J., Carlin, J. B., Thomas, L., Rubin, K., & Patton, G. (2001). Does bullying cause

    emotional problems? A prospective study of young teenagers. *British Medical Journal,*

    323, 480-484.

Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as an antecedent of young children's

    school adjustment: An examination of mediating processes. *Developmental*

    Psychology, 37, 550–560.

Crick, N.R., & Bigbee, M.A. (1998). Relational and overt forms of peer victimization: A

    multiinformant approach. *Journal of Consulting and Clinical Psychology, 66*(2), 337-

    347.

Crick, N. R., Casas, J. F., & Ku, H. C. (1999). Relational and physical forms of peer

    victimization in preschool. *Developmental Psychology, 33,* 579-588.

Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms on reactive and

    proactive aggression. *Child Development, 67*(3), 993-1002.

Cole, D. A., Dukewich, T. L., Roeder, K., Sinclair, K. R., McMillan, J., Will, E., Bilsky, S. A.,

    Martin, N. C., & Felton, J. W. (2014). Linking peer victimization to the development of

    depressive self-schemas in children and adolescents. *Journal of Abnormal Child*

    Psychology, 42, 149-160.

Crick, N. R., & Grotpeter, J. K. (1996). Children's treatment by peers: Victims of relational and

    overt victimization. *Development and Psychopathology, 8,* 367-380. doi:

    10.1017/S0954579400007148

Curran, P. J., Obeidat, K., & Losardo, D. (2010). Twelve frequently asked questions about growth curve modeling. *Journal of Cognitive Development, 11*(2), 121-136.

Czyz, E. K., & King, C. A. (2015). Longitudinal trajectories of suicidal ideation and subsequent suicide attempts among adolescent inpatients. *Journal of Clinical Child and Adolescent Psychology, 44*(1), 181-193.

Dill, E.J., Vernberg, E.M., Fonagy, P., Twemlow, S.W., & Gamm, B.K. (2004). Negative affect in victimized children: The roles of social withdrawal, peer rejection, and attitudes towards bullying. *Journal of Abnormal Child Psychology, 32*, 159–173.

Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201–218). Hillsdale , NJ : Erlbaum.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53*(6), 1146-1158.

Duncan, T. E., & Duncan, S. C. (2004). An introduction to latent growth curve modeling. *Behavior Therapy, 35*(2), 333-363.

Epkins, C. C. (1993). A preliminary comparison of teacher ratings and child self-report of depression, anxiety, and aggression in inpatient and elementary school samples. *Journal of Abnormal Child Psychology, 21*(6), 649-661.

Evans, C. B.R., Fraser, M. W., Cotter, K. W. (2014). The effectiveness of school-based bullying prevention programs: A systematic review. *Aggression and Violent Behavior, 19*, 532-544.

Felix, E. D., & McMahon, S. D. (2007). The role of gender in peer victimization among youth: A

study of incidence, interrelations, and social cognitive correlates. *Journal of School Violence, 6*, 27-44.

Fite, P. J., Cooley, J. L., Williford, A., Frazer, A., & DiPierro, M. (2014). Parental school involvement as a moderator of the association between peer victimization and academic performance. *Children and Youth Services Review, 44*, 25-32.

Fite, P. J., Evans, S. C., Cooley, J. L., & Rubens, S. L. (2014). Further evaluation of associations between attention-deficit/hyperactivity and oppositional defiant disorder symptoms and bullying-victimization in adolescence. *Child Psychiatry and Human Development, 45*(1), 32-41.

Fite, P. J., Rathert, J., Colder, C. R., Lochman, J. E. & Wells, K. C. (2010). Proactive and Reactive Aggression. In R. J. R. Levesque (Ed.) *Encyclopedia of Adolescence.* New York: Springer.

Galbraith, S., Bowden, J., & Mander, A. (2014). Accelerated longitudinal designs: An overview of modelling, power, costs and handeling missing data. *Statistical Methods in Medical Research.*

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*, 549-576.

Graham, S., & Juvonen, J. (1998). Self-blame and peer victimization in middle school: An attributional analysis. *Developmental Psychology, 34*, 538-587.

Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science, 8*, 206-213.

Hawker, D. S., & Boulton, M. J. (2000). Twenty years' research on peer victimization and

psychosocial adjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry, 41*(4), 441–455.

Hoge, R. D., & McKay, V. (1987). Criterion-related validity data for the Child Behavior Checklist- Teacher Report Form. *Journal of School Psychology, 24*, 387-393.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods, 6*(1), 53-60.

Juvonen, J., Nishina, A., & Graham, S. (2000). Peer harassment, psychological adjustment, and school functioning in early adolescence. *Journal of Educational Psychology, 92*, 349-359.

Kempes, M., Matthys, W., de Vries, H., & van Engeland, H. (2005). Reactive and proactive aggression in children: A review of theory, findings and the relevance for child and adolescent psychiatry. *European Child & Adolescent Psychiatry, 14*(1), 11-19.

Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York: Guilford

Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Cause or consequence of school maladjustment? *Child Development, 67*, 1305-1317.

Kochenderfer-Ladd, B., & Wardrop, J. L. (2001). Chronicity and instability of children's peer victimization experiences as predictors of loneliness and social satisfaction trajectories. *Child Development, 72*(1), 134–151.

Ladd, G.W., Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a predictor of young children's early school adjustment. *Child Development, 67*, 1103–1118.

Lamarche, V., Brendgen, M., Boivin, M., Vitaro, F., Dionne, G., & Pérusse, D. (2007). Do

friends' characteristics moderate the prospective links between peer victimization and

reactive and proactive aggression? *Journal of Abnormal Child Psychology, 38*, 665-680.

Leadbeater, B. J., & Hoglund, W. L. G. (2009). The effects of peer victimization and physical

aggression on changes in internalizing from first to third grade. *Child Development, 80*(3), 843-859.

Lester, L., Cross, D., Dooley, J., & Shaw, T. (2012). Developmental trajectories of adolescent

victimization: Predictors and outcomes. *Social Influence, 8*(2-3), 107-130.

Little, T. D., Jorgensen, T. D., Lang, K. M., & Moore, W. G. (2014). On the joys of missing data.

Journal of Pediatric Psychology, 39(2), 151-162.

Lopez, C., & DuBois, D. L. (2005). Peer victimization and rejection: Investigation of an

integrated model of effects on emotional, behavioral, and academic adjustment in early

adolescence. *Journal of Clinical Child and Adolescent Psychology, 34*, 25-36.

Mackie, C. J., Castellanos-Ryan, N., & Conrod, P. J. (2011). Developmental trajectories of

psychotic-like experiences across adolescence: Impact of victimization and substance

use. *Psychological Medicine, 41*(1), 47-58.

Muthen, B. (2003). Statistical and substantive checking in growth mixture modeling: Comment

on Bauer and Curran (2003). *Psychological Methods, 8*, 369-377.

Muthen, B., & Asparouhov, T. (2015). Growth mixture modeling with non-normal distributions.

Statistics in Medicine, 34, 1041-1058.

Muthen, B. O., & Curran, P. J. (1997). General longitudinal modeling of individual differences

in experimental designs: A latent variable framework for analysis and power estimation.

Psychological Methods, 2(4), 371-402.

Nakamoto, J., & Schwartz, D. (2010). Is peer victimization associated with academic

achievement? A meta-analytic review. *Social Development, 19*, 221–242.

Newman, D. A. (2003). Longitudinal modeling with randomly and systematically missing data: A simulation of ad hoc, maximum likelihood, and multiple imputation techniques. *Organizational Research Methods, 6*, 328-362.

Nishina, A., & Juvonen, J. (2005). Daily reports of witnessing and experiencing peer harassment in middle school. *Child Development, 76*, 435-450.

Nishina, A., Juvonen, J., & Witkow, M. R. (2005). Sticks and stones may break my bones, but names will make me feel sick: The psychosocial, somatic, and scholastic consequences of peer harassment. *Journal of Clinical Child and Adolescent Psychology, 34*(1), 37-48.

Nylund, K. L., Asparouhov, T., & Munthen, B. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling, 14*, 535-569.

Nylund, K., Bellmore, A., Nishina, A., & Graham, S. (2007). Subtypes, severity, and structural stability of peer victimization: What does latent class analysis say? *Child Development, 78*, 1706-1722

Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere.

Pellegrini, A. D. (1998). Bullies and victims in school: A review and call for research. *Journal of Applied Developmental Psychology, 19*(2), 216-224.

Perry, D.G., Kusel, S. J., & Perry, L. C. (1988). Victims of peer aggression. *Developmental Psychology, 16*, 77–93.

Poulin, F., & Boivin, M. (2000). Reactive and proactive aggression: Evidence of a two-factor model. *Psychological Assessment, 12*, 115-122.

Preacher K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (Eds.). (2008). *Latent Growth Curve Modeling.* Thousand Oaks, CA: SAGE Publications, Inc.

Ram, N., & Grimm, K. J. (2009). Growth mixture modeling: A method for identifying differences in longitudinal change among unobserved groups. *International Journal of Behavioral Development, 33*(6), 565-576.

Reijntjes, A., Kamphuis, J. H., Prinzie, P., Boelen, P. A., van der Schoot, M., & Telch, M. J. (2011). Prospective linkages between peer victimization and externalizing problems in children: A meta-analysis. *Aggressive Behavior, 37*, 215-222.

Reijntjes, A., Kamphuis, J. H., Prinzie, P., & Telch, M. J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect, 34*(4), 244–252.

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*, 98-131.

Rudolph, K. D. (2002). Gender differences in emotional responses to interpersonal stress during adolescence. Journal of Adolescent Health, 30, 3–13.

Rudolph, K. D., Troop-Gordon, W., Hessel, E. T., & Schmidt, J. D. (2011). A latent growth curve analysis of early and increasing peer victimization as predictors of mental health across elementary school. *Journal of Clinical Child and Adolescent Psychology, 40*(1), 111-122.

Rudolph, K. D., Troop-Gordon, W., Monti, J. D., & Miernicki, M. E. (2014). Moving against and away from the world: The adolescent legacy of peer victimization. *Development and Psychopathology, 26*, 721-734.

Salmivalli, C., & Helteenvuori, T. (2007). Reactive, but not proactive aggression predicts victimization among boys. *Aggressive Behavior, 33*, 198-206.

Schwartz, D., Dodge, K. A., Coie, J. D., Hubbard, J. A., Cillessen, A. H. N., Lemerise, E. A., & Bateman, H. (1998). Social-cognitive and behavioral correlates of aggression and victimization in boys' play groups. *Journal of Abnormal Child Psychology, 26*, 431-440. doi: 10.1023/A:1022695601088

Schwartz, D., Gorman, A. H., Nakamoto, J., & Tobin, R. L. (2005). Victimization in the peer group and children's academic functioning. *Journal of Educational Psychology, 97*, 425-435.

Sinharay, S., Stern, H. S., & Russell, D. (2001). The use of multiple imputation for the analysis of missing data. *Psychological Methods, 6*(4), 317-329.

Snyder, J., Brooker, M., Patrick, M. R., Snyder, A., Schrepferman, L., & Stoolmiller, M. (2003). Observed peer victimization during early elementary school: Continuity, growth, and relation to risk for child antisocial and depressive behavior. *Child Development, 74*, 1881-1898.

Stringaris, A., Maughan, B., Copeland, W. S., Costello, E. J., & Angold, A. (2013). Irritable mood as a symptom of depression in youth: Prevalence, developmental, and clinical correlates in the Great Smoky Mountains Study. *Journal of the American Academy of Child & Adolescent Psychiatry, 52*(8), 831-840.

Sutton, J., Smith, P. K., & Swettenham, J. (1999). Social cognition and bullying: Social inadequacy or skilled manipulation? *British Journal of Developmental Psychology,* 17, 435–450.

Troop-Gordon, W., & Ladd, G. W. (2005). Trajectories of peer victimization and perceptions of the self and schoolmates: Precursors to internalizing and externalizing problems. *Child Development, 76*, 1072-1091.

Underwood, M. K. (2003). *Social aggression among girls.* New York: Guilford

Vernberg, E. M, Jacobs, A. K., & Hershberger, S. L. (1999). Peer victimization and attitudes about violence during early adolescence. *Journal of Clinical Child Psychology, 28*(3), 386-395.

Von Oertzen, T., & Brandmaier, A. M. (2013). Optimal study design with identical power: An application of power equivalence to latent growth curve models. *Psychology and Aging, 28*(2), 414-428.

Wang, M., & Bodner, T. E. (2007). Growth mixture modeling: identify and predicting unobserved subpopulations with longitudinal data. *Organizational Research Methods, 10*(4), 635-656.

Waschbusch, D. A., Willoughby, M. T., & Pelham, W. E., Jr. (1998). Criterion validity and the utility of reactive and proactive aggression: Comparisons to attention deficit hyperactivity disorder, oppositional defiant disorder, conduct disorder, and other measures of functioning. *Journal of Clinical Child Psychology, 27*(4), 396-405.

Weiss, B. & Garber, J. (2003). Developmental differences in the phenomenology of depression. *Development and Psychopathology, 15*, 403-430.

Wothke, W. (2000). Longitudinal and multigroup modeling with missing data. In T. D. Little, K. U. Schnabel, & J. Baumert (Eds.), *Modeling longitudinal and multilevel data: Practical issues, applied approaches, and specific examples* (pp. 219-240, 269-281). Mahwah, NJ: Erlbaum.

Table 1: Timeline of Data Collection

Cohort	3rd Grade	4th Grade	5th Grade
A			Fall 2012
B		Fall 2012	Fall 2013
C	Fall 2012	Fall 2013	Fall 2014
D	Fall 2013	Fall 2014	
E	Fall 2014		

Table 2: Child and Teacher Participation at Each Time Point

Cohort	3rd Grade		4th Grade		5th Grade	
	Child	Teacher	Child	Teacher	Child	Teacher
A	-	-	-	-	61	104
B	-	-	84	137	101	143
C	76	119	79	117	96	117
D	99	124	91	118	-	-
E	108	140	-	-	-	-
TOTAL	283	383	254	372	267	364

Table 3: Diagnostics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender	-														
2. PV 3	-.53*	-													
3. PV 4	-.14*	.42*	-												
4. PV 5	-.09	.18	.27*	-											
5. RV 3	-.03	.69*	.35*	.06	-										
6. RV 4	-.11	.45*	.77*	.27*	.45*	-									
7. RV 5	.03	.00	.21*	.75*	.06	.26*	-								
8. PA 3	-.03	.27*	.05	.18	.25*	.02	.18	-							
9. PA 5	-.09	.29*	.06	.24*	.25*	.06	.30*	.30*	-						
10. RA 3	-.19*	.32*	.17*	.21*	.32*	.12	.24*	.77*	.22*	-					
11. RA 5	-.17*	.11	.04	.24*	.07	.05	.35*	.28*	.76*	.43*	-				
12. DS 3	-.02	.06	-.03	-.13	.05	-.03	-.05	.07	-.17	.23*	-.13	-			
13. DS 5	-.04	.06	.02	-.02	-.04	.07	-.06	-.02	.06	.05	.16*	.38*	-		
14. AD 3	.07	-.16*	-.09	-.09	-.20*	-.15	-.07	-.09	-.14	-.15*	-.07	-.26*	-.03	-	
15. AD 5	.10	-.07	-.19*	-.13*	-.20	-.22*	-.09	-.20*	-.22*	-.22*	-.28*	-.11	-.11*	.73*	-
M	-	1.50	1.30	1.32	1.58	1.40	1.46	1.19	1.30	1.45	1.56	1.23	1.17	3.50	3.68
SD	-	.74	.59	.58	.88	.72	.73	.52	56	.91	.87	.37	.29	1.09	.94
Skewness	-	2.21	2.96	2.77	2.25	2.89	2.57	3.46	2.00	2.26	1.78	2.03	2.14	-.34	-.41
Kurtosis	-	5.64	11.15	9.18	4.93	9.18	7.61	13.70	3.59	4.56	3.03	4.13	4.23	-.54	-.47

*p ≤ .01
PV = Physical Victimization; RV = Relational Victimization; PA = Proactive Aggression: RA = Reactive Aggression; DS = Depressive
Symptoms; AD = Academic Difficulties; 3 = third grade; 4 = fourth grade; 5 = fifth grade

Table 4: Model Fit Indices and Latent Structure for Single Class Latent Growth Curve

	χ2	df	p	RMSEA	CFI	TLI	AIC	BIC	Intercept	Slope	Slope with Intercept
					Model Fit				Latent Structure		
Physical Victimization	9.11	1	0.003	0.11	0.57	-0.30	3791.23	3827.29	0.89*	-0.38	-0.88
Relational Victimization	7.76	1	0.005	0.10	0.72	0.16	4562.97	4599.02	0.86*	-0.27	-0.85

* p < .001; Estimates for latent structure are standardized

Table 5: Model Fit Indices for Trajectory Analysis

Physical Victimization

	AIC	BIC	Entropy
2 Group Model	3722.65	3772.23	.95
3 Group Model	3649.76	3712.87	.92
4 Group Model	3639.32	3715.95	.86
5 Group Model	3645.32	37.47	.88

Relational Victimization

	AIC	BIC	Entropy
2 Group Model	4470.31	4519.89	.88
3 Group Model	4411.77	4474.87	.91
4 Group Model	4402.57	4479.20	.85
5 Group Model	4389.18	4479.32	.85

Table 6: Model Fit Indices for Trajectory Analysis between Boys and Girls

Physical Victimization

	Boys			Girls		
	AIC	BIC	Entropy	AIC	BIC	Entropy
2 Group Model	1996.06	2038.04	.97	1681.02	1722.94	.88
3 Group Model	1951.92	2005.36	.95	1662.30	1715.09	.91
4 Group Model	1944.66	2009.55	.85	1668.30	1733.09	.91
5 Group Model	1950.66	2027.00	.87	1666.52	1742.74	.86

Relational Victimization

	Boys			Girls		
	AIC	BIC	Entropy	AIC	BIC	Entropy
2 Group Model	2322.45	2364.44	.90	2139.43	2181.35	.90
3 Group Model	2296.92	2350.36	.91	2111.75	2165.10	.91
4 Group Model	2289.77	2354.66	.85	2108.77	2173.55	.88
5 Group Model	2295.77	2372.11	.87	2113.29	2189.51	.87

Table 7: Relations between Trajectories of Victimization and Psychosocial Outcomes

Physical Victimization

	Proactive Aggression	Reactive Aggression	Depressive Symptoms	Academic Difficulties
Class 1 (Increasing)				
Intercept	-0.23	-2.87	-0.22	-0.05
Slope	-2.77	-5.70	-0.14	-0.69
Class 2 (Decreasing)				
Intercept	1.21	0.44	-0.43	024
Slope	3.81	2.66	-1.08	0.22
Class 3 (Not Victimized)				
Intercept	0.43	0.29	-0.03	-0.20
Slope	-0.05	-0.09	-0.31	0.46

Relational Victimization

	Proactive Aggression	Reactive Aggression	Depressive Symptoms	Academic Difficulties
Class 1 (Increasing)				
Intercept	0.95	-1.47	-0.34	0.31
Slope	3.05	-0.40	-0.72	1.39
Class 2 (Decreasing)				
Intercept	0.16	0.34	-0.22	0.06
Slope	2.02	2.88	-0.01	0.66
Class 3 (Not Victimized)				
Intercept	0.44	0.40	-0.17	-0.17
Slope	0.70	1.07	-0.30	0.74

Figure 1: Basic Growth Mixture Model with Outcome in Original Proposal
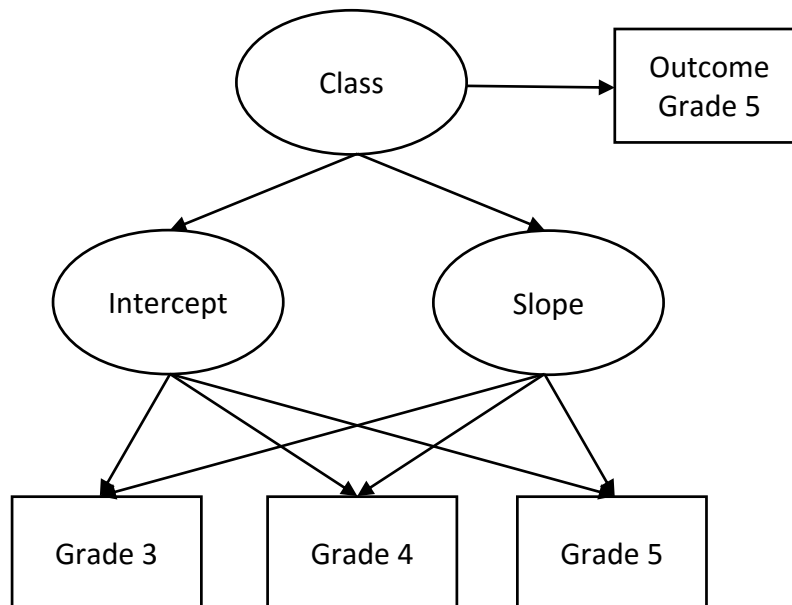
Figure 2: Basic Growth Mixture Model with Outcome in Final Model

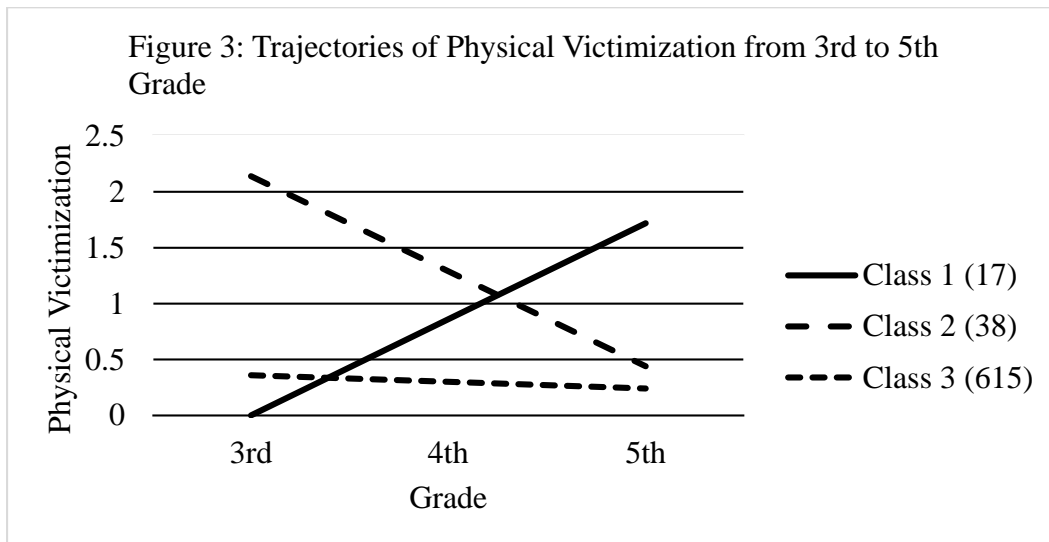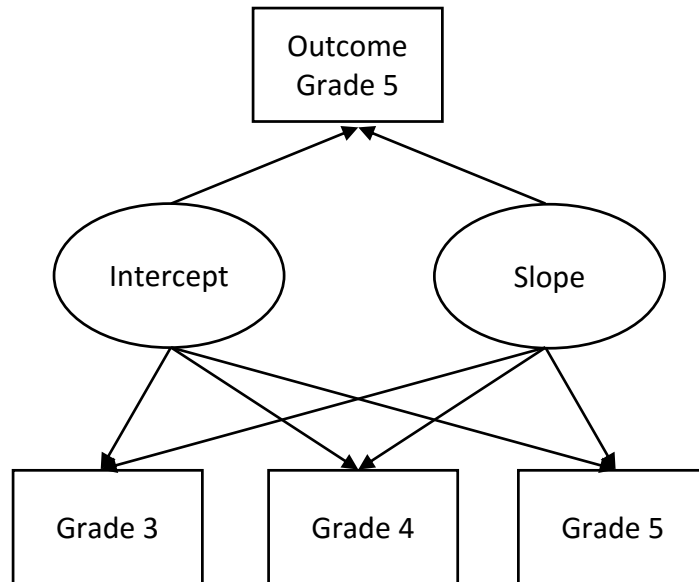Figure 3: Trajectories of Physical Victimization from 3rd to 5th Grade

Figure 4: Trajectories of Relational Victimization for 3rd to 5th Grade