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THE RELATION BETWEEN PEER VICTIMIZATION AND CHANGES IN TRAUMA  
SYMPTOMS IN ADOLESCENTS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science,  
at Virginia Commonwealth University.

by

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November 2014

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## **Abstract**

### **THE RELATION BETWEEN PEER VICTIMIZATION AND CHANGES IN TRAUMA SYMPTOMS IN ADOLESCENTS**

By Anh-Thuy H. Le, B.S.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science, at Virginia Commonwealth University.

Virginia Commonwealth University, 2014

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Peer victimization has been shown to negatively impact youth functioning and may be especially damaging during adolescence, given the increased importance of peers. However, there is a dearth of longitudinal research examining trauma symptomatology as an outcome of peer victimization with low-income, ethnic minority adolescents. The present study investigated this relation in a predominantly African American sample of 684 students assessed at five time points between the fall of their sixth grade and seventh grade school years. Growth mixture models grouped participants with similar victimization trajectories, and latent growth models related growth trajectories of physical and relational victimization to changes in trauma

symptoms. Although initial levels of victimization were unrelated to changes in trauma symptoms over time, increasing victimization was associated with increasing trauma symptoms. These findings provide insight into the relation between peer victimization and trauma in an underserved sample of adolescents, with important implications for prevention efforts.

## The Relation between Peer Victimization and Changes in Trauma Symptoms in Adolescents

Peer victimization is a serious concern that affects a high percentage of children and adolescents each year. A recent report by the National Center for Education Statistics (2013) indicated that, in 2011, the rate of violent victimization at school for youth ages 12 to 18 was 24 per 1,000 students. Further, 28% of surveyed youth reported being bullied, which included being called names, having rumors spread about them, being threatened, and deliberately being excluded from activities by their peers. Although the term peer victimization has been defined differently across studies, at its broadest, it can be described as a form of abuse in which a child is targeted by various forms of peer aggression (Kochenderfer & Ladd, 1996a), including physical, verbal, and relational aggression. Bullying is encompassed by this broader term and has been defined as a harmful behavior that is perpetrated repeatedly in a relationship characterized by an imbalance of power (Olweus, 1994). Although these terms are often used interchangeably, it is important to note that bullying is more narrowly defined than peer victimization.

The prevalence of peer victimization for middle school and high school youth has ranged across studies from 11% (Nansel et al., 2001) to 77% (Finkelhor, Ormrod, Turner, & Hamby, 2005; Haynie et al., 2001; Hoover, Oliver, & Hazler, 1992). Because aggression peaks in the early middle school years, adolescents in middle school may be at particular risk of experiencing frequent peer victimization (Nylund, Bellmore, Nishina, & Graham, 2007). A greater understanding of victimization during this developmental period is therefore needed in order to better inform intervention efforts aimed at reducing peer victimization and aggression.

Considerable research has established the impact of peer victimization on adjustment. Previous studies have found that victimized youth exhibit higher rates of internalizing (Reijntjes, Kamphuis, Prinzie, & Telch, 2010), externalizing (Sullivan, Farrell, & Klierer, 2006), academic (Schwartz, Gorman, Nakamoto, & Toblin, 2005), and health problems (Rigby, 1998) compared to their nonvictimized counterparts. For example, victimization has been shown to be associated with greater aggression, lower grade point average, and cognitive difficulties. It has also consistently been linked to greater depression, anxiety, and loneliness.

One type of internalizing problem that warrants further examination is trauma symptomatology, based on cross-sectional research demonstrating an association between peer victimization and trauma in youth (e.g., Crosby, Oehler, & Capaccioli, 2010; Idsoe, Dyregrov, & Idsoe, 2012; Mynard, Joseph, & Alexander, 2000; Storch & Esposito, 2003). Theories that account for the relation between victimization and trauma symptoms include learned helplessness theory and the theory of shattered assumptions. Learned helplessness theory (Abramson, Seligman, and Teasdale, 1978) suggests that repeated victimization may cause youth to develop posttraumatic stress as a result of realizing that they are helpless to change their situation. The theory of shattered assumptions (Janoff-Bulman, 1989) states that victimization causes individuals to develop trauma symptoms as a result of difficulty reconciling the negative event to their previously-held positive beliefs about the world, themselves, and others. Victimized individuals may also develop more negative self-concepts and perceive the world and others as more threatening or dangerous. Further, repeated victimization may prime youth to believe that they are constantly at risk, resulting in hyper-arousal and selective attention to dangerous cues in a given situation.

Given the potential for peer victimization to be a traumatic experience for youth, particularly if it is ongoing, there is a clear need for research to determine whether certain patterns of peer victimization are associated with more frequent or severe trauma symptoms. Because of the importance of peers during adolescence, an understanding of how variations in patterns of victimization relate to levels of trauma symptoms during this developmental period is needed to better inform intervention efforts. If the impact of peer victimization is cumulative, with chronically victimized youth exhibiting greater maladjustment, intervention programs should target these adolescents with additional psychosocial supports. On the other hand, if victimization affects all victims equally, regardless of duration, then violence prevention programs should be universal in nature and should concentrate on reducing the frequency of victimization. Finally, if victimization produces lasting effects even after it has ended, efforts beyond simply stopping the occurrence of victimization must be undertaken to address youth's residual maladjustment.

Based on the high reported rates of peer victimization and the association between victimization and various negative outcomes, it is evident that peer victimization is a serious national problem and a salient concern for many adolescents. The present study extends the existing literature by examining the relation between victimization and posttraumatic stress in a predominantly African American sample of low-income adolescents, using data that were collected every three months. Prior research has been restricted to primarily Caucasian samples despite evidence that peer victimization may have different effects on functioning depending on students' race (Spriggs, Iannotti, Nansel, & Haynie, 2007). Moreover, studies have shown that low-income youth are more likely to experience victimization (Dake, Price, & Telljohann, 2003),

which suggests that further research with this population should be conducted to better inform effective prevention and intervention efforts. This study was also designed to address another methodological limitation of previous research; namely, the long intervals of time between assessments. In the present study, data were collected every three months, allowing for an examination of the relation between peer victimization and trauma symptoms within a given school year. This is in contrast to the majority of longitudinal studies examining the relation between victimization and internalizing problems, which have collected waves of data separated by at least six months (e.g., Biggs et al., 2010; Boivin, Petitclerc, Feng, & Barker, 2010; Kochenderfer-Ladd & Wardrop, 2001).

A preponderance of the literature has also focused on younger age groups, with many researchers examining the association between victimization and negative outcomes in elementary school students (e.g., Biggs et al., 2010; Boivin, Petitclerc, Feng, & Barker, 2010; Kochenderfer-Ladd & Wardrop, 2001) and preschool students (Barker et al., 2008). Given that victimization is more salient in middle school due to the increased importance of peers, the lack of research focused on this developmental period must be addressed to better understand whether the relation between peer victimization and adjustment persists in adolescence. Further, research examining the relation between victimization and trauma symptoms has been scarce, though exceptions do exist (e.g., Crosby, Oehler, & Capaccioli, 2010; Kamen et al. 2013; Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011). However, these studies have either been cross-sectional or have used retrospective reports to assess prior victimization, which may have distorted findings by assessing memories of past victimization rather than current experiences of victimization.

Many previous studies have also been limited by their use of cutoff scores to define victimization classes. The primary disadvantage of using cutoff scores is the arbitrariness of determining what value should serve as the cutoff, and the lack of guidelines regarding how many classes are warranted (Nylund, Bellmore, Nishina & Graham, 2007). In the present study, growth mixture modeling was used to identify groups that differed in their victimization trajectories. Growth mixture modeling provides the benefit of both conventional growth modeling and latent growth curve analyses. This approach examines patterns of change over time, estimates mean growth curves for different classes, and takes into account individual variation around each of these growth curves through growth factor variances for each class (Muthén & Muthén, 2000).

The following literature review first defines peer victimization and discusses its prevalence during adolescence. This is followed by an examination of the literature on negative outcomes of peer victimization, particularly the relations between peer victimization and internalizing problems. Next, studies examining the relation between peer victimization and trauma symptoms are discussed. Research on the relation between changes in victimization and adjustment over time is then discussed, with an emphasis on how the duration and timing of peer victimization influences adjustment outcomes. A discussion of competing theories that purport to explain the influence of the timing and duration of victimization is then presented. The first two theories, the onset and cessation hypotheses, address the influence of the timing of victimization. Next, to explain the impact of the duration of victimization, the chronic stress model and the life events model are discussed. The review concludes with a discussion of theories to explain the relation between victimization and subsequent adjustment difficulties,

including social information processing theory, general strain theory, learned helplessness theory, and cognitive theories of trauma.

## **Review of the Literature**

### **Prevalence and Definitions of Victimization**

Peer victimization has been defined as a form of abuse in which a child is targeted by peer aggression (Kochenderfer & Ladd, 1996a). Researchers have differentiated among specific forms of victimization based on the means used to cause harm. For instance, physical victimization involves actual or threatened physical harm, whereas verbal victimization is characterized by verbal behavior intended to hurt another, such as taunting and name-calling (Arsenault, Bowes, & Shakoor, 2010). These two forms of victimization have also been classified as overt victimization because they involve direct attacks against others. In contrast, relational victimization is considered a distinct construct that often involves more indirect means of harm. For example, it can include behaviors such as spreading rumors about a peer to damage their reputation and talking about someone behind their back (Grotzinger & Crick, 1996).

Relational victimization has been defined as harm via manipulation or damage to another's social relationships and has been shown to present unique challenges to well-being, above and beyond that caused by overt victimization (Crick & Bigbee, 1998; Crick, Casas, & Ku, 1999).

Of note, bullying is included under the term "peer victimization" and has been defined as behavior that is perpetrated repeatedly with the intent to harm, in a relationship characterized by an imbalance of power (Olweus, 1994). This term has often been used as a proxy for peer victimization, though this usage may not accurately reflect some youths' experiences with victimization, as bullying is more narrowly defined. Poor peer relations may also manifest in

ways other than victimization. For instance, peer rejection has often been studied with regard to youth's negative peer experiences (Van Lier & Koot, 2010). Distinguishing between rejection and victimization is important but can be difficult as the two constructs are often entangled. Namely, rejected youth may struggle to develop supportive friendships, which have been shown to protect against victimization depending on the number and quality of such relationships (Hodges, Malone, & Perry, 1997). Further, aggressors may feel justified or safe targeting disliked peers, as they are less likely to be punished by others for their actions, especially if the aggressors are socially connected (Rodkin, 2011). In fact, research has shown that physically aggressive boys and relationally aggressive girls are more socially connected than their nonaggressive counterparts, potentially diminishing the likelihood of repercussions for their behavior (Xie, Farmer, & Cairns, 2003). In contrast, youth who are repeatedly victimized may soon lose peer support and become increasingly rejected over time. Although this is an important issue to consider and warrants further investigation, the present study focused on peer victimization as it is more extreme than rejection, and may be more closely tied to trauma symptoms.

Within the literature, not only have different definitions of victimization been used across studies, but differing methods have also been applied in assessing victimization (Espelage & Swearer, 2003). For example, Finkelhor and colleagues (2005) defined bullying very broadly as being picked on, and included a measure of "emotional bullying," which they described as being harassed by peers. In contrast, victimization was defined by Haynie et al. (2005) as the frequency with which students experienced coercion and physical harm or threats. In addition to using different definitions of peer victimization, researchers have assessed its prevalence within

different time frames. Some, like Hoover, Oliver, and Hazler (1992) have assessed lifetime rates, whereas others, such as Finkelhor et al. (2005) and Nansel et al. (2001) have focused on experiences within the past year or school term.

Although there is general consensus in the literature that victimization is common among school-age children, the estimated prevalence of victimization varies by country and sample. For instance, the percentage of students reporting frequent victimization has ranged from 8% to 24% in studies conducted in Germany, England, and Malta (Borg, 1999; Wolke, Woods, Stanford, & Schulz, 2001). A nationally representative study of sixth to tenth graders in the U.S. found that approximately 30% of the sample was involved in moderate to severe bullying, as perpetrators, victims, or both. In particular, about 11% of the sample reported being a target of peer bullying (Nansel et al., 2001). Finkelhor and colleagues (2005) examined the prevalence of peer victimization in a nationally representative sample of youth ages 2 to 17 years. They found that approximately 20% of surveyed students reported being bullied (i.e., picked on, grabbed, coerced), and 25% reported being teased or emotionally bullied (i.e., called names, having mean things said about them), within the past year. A study conducted within middle schools in a suburban Maryland school district found that 47% of students reported being victimized at least once during the school year, and 31% were victimized three or more times (Haynie et al., 2001). In a study of a Midwestern school district, Hoover, Oliver, and Hazler (1992) found that 77% of adolescents in their sample had been victimized at some point during their years in school.

Despite the wide range of victimization rates reported, there has been agreement in the literature that peer victimization affects a considerable proportion of youth. Further, it is noted that victimization is more prevalent at younger ages and spikes during the transition from

elementary school to middle school, peaking during the early middle school years (Nansel et al., 2001; Pellegrini, 2002; Pellegrini & Bartini, 2000). One explanation for this increase in victimization is that the period of change between fifth and sixth grade is particularly challenging, as it is characterized by tentative new social roles and uncertainty regarding peer relations. Navigating new social roles is particularly relevant for adolescents as this developmental period involves greater peer interaction and peer influence, as youth are increasingly in contact with one another and social relations take on greater importance. During this stage, peers exert a strong influence on one another's self-concepts, identities and behaviors (Newman, Lohman, & Newman, 2007; Tanti, Stukas, Halloran, & Foddy, 2011). Social dominance theory attempts to account for the rise in aggression at this critical juncture, stating that, at a time of flux, such as the transition into a new school environment, youth attempt to establish their social status and secure their relationships (Pellegrini, 2002; Pellegrini & Bartini, 2000). During this transitional period, adolescents display a greater willingness to explore new means to achieve their social goals, which may result in the increased use of aggression by youth seeking to establish dominance over their peers (Williford, Brisson, Bender, Jenson, & Forrest-Bank, 2011).

Following this peak, overall rates of aggression, bullying and victimization decrease across the middle school years (Dake, Price & Telljohann, 2003; Nylund, Bellmore, Nishina & Graham, 2007; Pellegrini, 2002). It has been suggested that this trend is due to the increasing stabilization of bully and victim roles over time (Perry, Kusel, & Perry, 1988; Sweeting, Young, West, & Der, 2006). For instance, Perry, Perry, and Boldizar (1990) argued that, although bullies typically aggress against peers more haphazardly during early childhood, by adolescence,

they restrict the scope of their aggression to those students whom they know will not retaliate. At earlier ages, aggressive children may not yet be able to identify which of their peers will remain passive and which will react. Their attacks may therefore be more indiscriminate and target a wider range of students. Over time, however, aggressive youth may become better able to discern passive victims from retaliatory ones. With this knowledge, bullies may concentrate their aggression on a smaller subset of peers. This theory could account for the overall decline in the prevalence of victimization and the increasing stabilization of victim and bully status (Schäfer, Korn, Brodbeck, Wolke & Schulz, 2005). Studies have also found that chronic victimization is a very relevant concern for adolescents (e.g., Juvonen, Nishina, & Graham, 2000; Menesini, Modena, & Tani, 2009), whose roles as victims may have solidified over time, resulting in persistent attacks from their peers. Given these findings, it is evident that peer victimization is particularly salient for adolescents and has far-reaching consequences on their adjustment and well-being. This underscores the importance of further examining peer victimization during this developmental period in order to better inform intervention programs aimed at reducing youth violence and victimization.

Studies have typically found that boys experience higher rates of victimization in general, and are more often victims of overt aggression than girls (Crick & Nelson, 2002; Nylund, Bellmore, Nishina & Graham, 2007). Girls, on the other hand, are more often targets of relational aggression (Crick & Bigbee, 1998; Crick, Casas, & Ku, 1999; Crick & Nelson, 2002; Nylund, Bellmore, Nishina & Graham, 2007). Studies have also shown that gender moderates the impact that victimization has on victims (Rigby, 2000). For example, there is evidence that girls rate physical and social aggression as equally damaging, and that they view social

aggression as more hurtful than boys do (Galen & Underwood, 1997; Paquette & Underwood, 1999). As such, it is important to include multiple forms of victimization, including physical and relational, when studying this phenomenon so as not to underestimate the impact of peer victimization for boys or girls.

Research has also shown that overt and relational victimization are distinct constructs that impact adjustment differently. For example, Bagwell and Schmidt (2011) surveyed an ethnically diverse, predominantly low SES sample of third and fifth grade students during the fall and spring of the academic year. Students reported on the quality of their best friendships, as well as the frequency with which they experienced relational and overt peer victimization. Although poor friendship quality is not an internalizing problem, it has been shown to be associated with loneliness, which in turn predicts depression (Nangle, Erdley, Newman, Mason, & Carpenter, 2003). Bagwell and Schmidt (2011) found that relational victimization and overt victimization were indeed associated with different aspects of friendship quality. Specifically, relational victimization predicted greater friendship conflict during fall and spring but was not related to other features of friendship quality. Overt victimization, on the other hand, predicted greater conflict in addition to lower security and closeness in friendships.

In another study, Storch and Masia-Warner (2004) examined the impact of overt and relational victimization on social anxiety and loneliness in a predominantly Caucasian sample of high school girls. Four classes of victims were derived based on whether girls' scores on each victimization measure fell at least one standard deviation above the mean: overtly victimized, relationally victimized, overtly and relationally victimized, and non-victimized. The authors found that girls who were relationally victimized reported greater internalizing difficulties than

girls who were only victimized via overt aggression. Further, the degree of maladjustment reported by relationally victimized girls was comparable to that of girls who experienced both forms of victimization, suggesting that relational victimization had particularly detrimental effects on functioning. The degree of importance girls place on social relationships, particularly at this developmental stage, may explain why relational victimization alone was significantly more deleterious to adjustment than overt victimization. In particular, girls may view harm to peer relations as more distressing than direct physical or verbal harm.

Similar findings were reported by Crick, Casas, and Ku (1999) who examined the effects of relational and physical victimization in an ethnically diverse sample of younger students (preschool age). Victimization, depression, and peer acceptance were assessed with teacher ratings, social acceptance/rejection and prosocial behavior by peer nomination, and loneliness and social dissatisfaction by self-report. Results indicated that both forms of victimization were associated with teacher-reported internalizing problems, but that there were also unique patterns of associations with other outcomes. For instance, younger physically victimized students reported worse peer relationships than older physically victimized youth. Additionally, relational victimization was associated with lower peer-reported acceptance but no such effect was found for physical victimization.

Taken together, these studies suggest that overt and relational victimization warrant separate examination, as they each demonstrate unique relations to adjustment outcomes. The present study therefore examined physical and relational victimization separately in order to determine how trajectories for each victimization type related to adjustment over time. Physical victimization was used rather than overt victimization, as the term “overt” encompasses both

physical and verbal behaviors. Much of the present research on this topic has used aggregated measures of victimization, often by summing students' ratings on items assessing various victimization types, such as general, relational, and physical, or by calculating a mean score (e.g., Biggs et al., 2010; Rudolph, Troop-Gordon, Hessel, & Schmidt, 2011; Rueger, Malecki, & Demaray, 2011). This approach may obscure unique findings for each form of victimization and, as such, was avoided in the current study.

### **Relation between Peer Victimization and Adjustment Outcomes**

There has been consistent empirical support to indicate that victimized youth experience an array of negative outcomes spanning various domains of functioning. Specifically, the literature has shown that victimization is associated with internalizing (Goldbaum, Craig, Pepler, & Connolly, 2003; Hawker & Boulton, 2000) and externalizing difficulties (Reijntjes et al., 2011), as well as poor academic functioning (Schwartz, Gorman, Nakamoto, & Toblin, 2005) and health outcomes (Biebl, DiLalla, Davis, Lynch, & Shinn, 2011). For instance, in their meta-analysis of 14 longitudinal studies of the relation between peer victimization and externalizing behaviors, Reijntjes et al. (2011) found that victimization was associated with subsequent increases in externalizing difficulties, which included aggression, attention problems, and antisocial behaviors. The studies included in their analyses assessed children from early childhood to adolescence, with the majority focused on middle childhood. Not only was victimization related to later externalizing problems, but the authors also found reciprocal relations between the two variables, suggesting that externalizing difficulties may function as both an antecedent and consequence of peer victimization.

Victimization has also been linked to poorer academic functioning and social skills (Kochenderfer & Ladd, 1996a; Schwartz, Gorman, Nakamoto, & Toblin, 2005). For example, risk factors for victimization include interpersonal difficulties such as having poorer quality peer relations (Goldbaum, Craig, Pepler, & Connolly, 2003; Nansel et al., 2001). Victims have also been shown to have lower grade point averages, be less engaged in school, and be more highly rejected by peers, compared to their nonvictimized counterparts (Giang & Graham, 2007). These outcomes often result in further victimization, which serves to worsen the psychosocial maladjustment that such children experience.

Furthermore, research has shown an association between peer victimization and poorer health outcomes for samples of youth from different countries (Biebl et al., 2011; Houbre, Tarquinio, Thuillier, & Hergott, 2006; Rigby, 1999). In their study of French fourth and fifth graders, Houbre et al. (2006) found that victimized youth reported more somatic problems compared to both their nonvictimized and aggressive peers. Victims were much more likely to report cognitive difficulties such as memory and attention problems, eating disorders, and sleep problems. Similar results were found in samples from the United States and Australia, where victimized youth displayed more sleep problems, headaches, and mouth sores (Biebl et al., 2011; Rigby, 1999). These findings indicate that the link between victimization and health problems is robust across diverse samples.

**Relation between peer victimization and internalizing problems.** Within the literature, the term “internalizing problems” has often been used to describe a variety of negative outcomes that are directed towards the self rather than at others; the most notable examples of which are depression and anxiety. The relation between victimization and internalizing

difficulties is particularly important to study as internalizing difficulties are characteristic of many victimized youth (Reijntjes et al., 2010). Cross-sectional and longitudinal studies have been conducted to examine this relation, with depression, anxiety, and loneliness being the most frequent outcomes of interest (Kochenderfer & Ladd, 1996a; Kochenderfer-Ladd & Wardrop, 2001; Nylund, Bellmore, Nishina, & Graham, 2007). Research has typically shown both concurrent and predictive relations between peer victimization and internalizing problems, though some studies have found mixed results regarding this relation.

For instance, Craig (1998) examined the relation between victimization, anxiety, and depression in a sample of 546 fifth to eighth grade students. Victimization was assessed using the Relational Aggression and Victimization Scale, which consisted of scales assessing the frequency of physical, verbal, and indirect/relational victimization. Each form of victimization was considered separately, rather than as an aggregated measure of total victimization, which represents a departure from most other studies examining the relation between peer victimization and maladjustment. Depression was assessed with the Children's Depression Inventory and anxiety with the Social Anxiety Scale. Results indicated that all three forms of victimization uniquely predicted social anxiety. Hanish and Guerra (2002) also examined the relation between victimization and internalizing difficulties with an ethnically diverse sample of first, second, and fourth grade students who were assessed over two years. Using cluster analysis, they defined eight profiles of adjustment based on peer and teacher ratings of functioning; these included externalizing, internalizing, symptomatic, disliked, and high achieving groups. The authors found that profiles of adjustment were differently related to victimization. Specifically, although

peer victimization predicted subsequent membership in the externalizing, disliked, and symptomatic groups, it did not predict inclusion in the internalizing group.

In their meta-analysis of cross-sectional studies, Hawker and Boulton (2000) found that victimized children were more likely than nonvictimized children to display depressive symptoms, anxiety, and loneliness. In addition, victimized youth reported lower self-esteem and social self-concept, suggesting that they viewed themselves in a negative light, particularly with regards to peer relations. Overall, effect sizes were strongest for the association between depression and victimization. Effect sizes were moderate for studies involving global self-esteem, and were smallest in studies of anxiety. These findings indicate that depression may be particularly salient to victimized youth, who may feel dejected and unhappy at bearing the brunt of their peers' aggression. These studies were conducted with male and female youth, across a wide age range, although the majority of participants were in middle childhood. Studies from across countries and nationalities were included in the meta-analysis, suggesting that these associations are robust across various populations. However, victimization was often narrowly defined in these studies based on composite measures of physical and verbal victimization, with few studies including relational or indirect victimization.

Longitudinal research has also been conducted to explore the relation between peer victimization and internalizing problems. Evidence for reciprocal relations between peer victimization and internalizing problems has been mixed, with different patterns of association emerging depending on the specific internalizing problem and form of victimization assessed. For instance, Fekkes, Pijpers, Fredriks, Vogels, and Verloove-Vanhorick (2006) found support for bidirectional associations in their longitudinal study of 9 to 11 year old Dutch students.

Youth were asked to report on their victimization experiences and their psychosocial and somatic symptoms, at two time points, which were two years apart. The authors determined that, in addition to victimization predicting later maladjustment, children who initially reported higher levels of depression and anxiety were also more likely to be victimized by their peers.

In their four-year longitudinal study of third to sixth grade youth, Boivin et al. (2010) also found support for bidirectional relations between peer victimization, social withdrawal, and emotional vulnerability. Peer nominations were used to assess overt victimization, which included being beat up, called names, and picked on. Indirect verbal and relational victimization were not included in this measure. Using cross-lagged models, the authors found support for modest, positive bidirectional relations between victimization and social withdrawal, as well as between peer victimization and emotional vulnerability, across one-year intervals. These results illustrate the influence that victimization and internalizing difficulties exert on one another, which must not be overlooked in trying to better understand the effects of victimization.

Reijntjes and colleagues (2010) conducted a meta-analysis of longitudinal studies examining the relation between victimization and internalizing problems, which included 18 longitudinal studies that assessed broadband internalizing problems, as opposed to individual constructs such as depression and anxiety. The authors found support for bidirectional relations between peer victimization and internalizing difficulties, such that each construct at baseline significantly predicted subsequent changes in the other. Effect sizes for each of these pathways were comparable, suggesting similar predictive power. This indicates that, although the extant literature has typically focused on predicting maladjustment from peer victimization, there is also evidence of bidirectional effects such that internalizing problems place youth at greater risk for

subsequent victimization. It may be that internalizing difficulties, such as depression and anxiety, hinder youth's abilities to develop close and protective peer relationships as these individuals may be more irritable, lack motivation, and may withdraw from social situations. As a result, depressed and anxious youth may be more susceptible to peer victimization than their well-adjusted counterparts (Rudolph, Troop-Gordon, Hessel, & Schmidt, 2011).

Less clear results have emerged in other studies, with regard to reciprocal relations between internalizing problems and peer victimization. For instance, Storch and colleagues (2005) examined the prospective, bidirectional relations between peer victimization, general social anxiety, and social phobia. Their predominantly Caucasian sample consisted of 198 ninth grade students from an urban parochial school. Peer victimization was measured by the Social Experience Questionnaire, and included both overt and relational victimization. Social anxiety and social phobia were assessed with the Social Anxiety Scale for Adolescents and the Social Phobia and Anxiety Inventory for Children, respectively. Youth completed measures during the fall of their ninth grade year, and again one year later. Results showed that relational victimization predicted subsequent social phobia, whereas overt victimization did not. Further, social anxiety did not predict either form of victimization. This suggests a unidirectional relation between relational victimization and social anxiety, such that victimization predicts anxiety, rather than bidirectional associations as other studies have shown. Van Lier and Koot (2010) also found that peer victimization did not predict changes in internalizing problems in a four-year longitudinal study. However, victimization did predict social preference, which in turn was related to internalizing difficulties. For this reason, the authors argued that including multiple

indicators of peer relations is critical to disentangle the effects they may have on adjustment outcomes.

Another outcome that is included under the term “internalizing problems” is distress or trauma symptomatology. Trauma symptoms are distinct from other forms of internalizing difficulties as they represent a more severe response to distressing life events. In the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition, text revision; *DSM-IV-TR*; American Psychiatric Association, 2000), posttraumatic stress disorder (PTSD) is included under the umbrella term of anxiety disorders. Criteria for a diagnosis of PTSD include exposure to a traumatic event with a risk of serious injury or death to self or others; persistent re-experiencing in the form of flashbacks, recurring distressing dreams, or intense psychological response to reminders of the event; persistent avoidance and emotional numbing, including avoidance of stimuli, places, or behaviors associated with the trauma; increased arousal, such as sleep difficulties and hypervigilance; clinically significant impairment; and a duration of symptoms for at least one month.

Studies have shown a link between peer victimization and the development of trauma symptoms in adolescents (Carney, 2008; Crosby, Oehler, & Capaccioli, 2010; Idsoe, Dyregrov, & Idsoe, 2012; Mynard, Joseph, & Alexander, 2000; Stickley et al., 2013; Storch & Esposito, 2003). For instance, in their 2010 study, Crosby and colleagues examined the relation between peer victimization and posttraumatic stress symptoms in a sample of 244 rural students, in fifth to eighth grade. They found that physical, verbal, and relational victimization were positively related to posttraumatic stress symptoms, such as avoidance, intrusive thoughts and nightmares.

Additionally, the authors found evidence of gender differences, such that girls reported higher rates of relational victimization and PTSD symptomatology than did boys.

Storch and Esposito (2003) conducted a similar study with a more ethnically diverse sample of students. Specifically, they assessed 205 primarily low-income students in fifth and sixth grade to determine whether overt and relational peer victimization were each significantly related to trauma symptoms. They found moderate positive associations between each form of victimization and posttraumatic stress, regardless of gender. Storch and Esposito's study (2003) represents an exception to the majority of the research in this area, which has tended to examine predominantly Caucasian samples.

Despite evidence of a significant and positive relation between peer victimization and posttraumatic stress, few studies have examined this link longitudinally in adolescents. Those that have done so have relied on retrospective accounts of victimization. For example, Newman, Holden, and Delville (2005) conducted a study with a predominantly Caucasian sample of 853 undergraduate students. Participants reported the frequency with which they were bullied before and during high school (*never, occasionally, or frequently*), as well as the degree to which they felt isolated during adolescence (*not at all to very*). They also completed the Trauma Symptom Checklist to assess current levels of stress and trauma symptoms. Results showed that bullying prior to high school was significantly related to bullying during high school. Further, of those students who were bullied frequently prior to high school, greater victimization during high school was associated with greater reports of distress in college. The relation between degree of victimization as an adolescent and current level of distress was also moderated by participants' perceptions of isolation due to bullying. That is, victimization and distress were more strongly

related for youth who perceived themselves as more isolated as a result of their victimization experiences.

Kamen et al. (2013) also examined the effect of childhood bullying on current trauma symptomatology. They assessed 171 HIV-positive men who were part of a broader study on group interventions for HIV and trauma. Bullying was measured by the Multidimensional Peer-Victimization Scale, which asks how frequently participants experienced physical, relational, and verbal victimization prior to age 18. Trauma symptoms in the past seven days were assessed via the Impact of Events Scale-Revised (*not at all to extremely*). The authors found that bullying in childhood predicted unique variance in trauma symptoms in adulthood, even after accounting for other forms of trauma such as crimes, general disaster, and assault.

Two other retrospective studies were conducted with adolescents and examined whether reports of past victimization predicted current trauma symptoms (Mynard, Joseph, & Alexander, 2000; Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011). Turner and colleagues (2011) examined this question with a nationally representative sample of youth ages 6 to 17. In contrast to other studies, more extreme forms of peer aggression, such as property crime and sexual victimization, were included. Results showed that, when considered independently, each form of victimization significantly predicted trauma symptoms, controlling for demographic variables. In particular, emotional victimization, which included peer rejection and peers saying mean things, demonstrated the strongest association with trauma symptoms. Further, a model in which all forms of victimization were included found a stronger relation between victimization and trauma symptoms than the relations that emerged when each form of victimization was considered independently.

Although these studies are a useful starting point, they were not longitudinal designs in nature. Instead, they relied on retrospective reports of peer victimization and trauma symptoms in adolescence or adulthood. In particular, those studies conducted with adult samples examined associations across a long interval of time, raising concerns about the accuracy of recall compared to reports within a shorter timeframe (e.g., within the past month) (Sudman & Bradburn, 1973). The scarcity of longitudinal empirical research that considers the association of peer victimization and trauma symptoms during adolescence remains a significant limitation of the current literature and warrants further investigation. Without longitudinal studies, causal conclusions cannot be made regarding the direction of the association between peer victimization and PTSD symptoms.

### **Patterns of Victimization and their Relation to Adjustment**

More recently, studies have focused on identifying distinct patterns of victimization and determining their relation to youth functioning. In studies that have defined patterns over time, four classes have typically emerged: chronic/stable victims (victimized across waves), late-onset/new victims (youth who were not victims at the earlier time points but become victims at a later time), desisters/old victims (youth who begin as victims but move out of victimization status at a later time point), and nonvictimized/infrequently victimized youth (youth who report not being victimized or consistently low levels of victimization) (e.g., Goldbaum Pepler, Craig, & Connolly, 2003; Juvonen, Nishina, & Graham, 2000; Rueger, Malecki, & Demaray, 2011; Scholte, Engels, Overbeek, De Kemp, & Haselager, 2007). Notably, these classes closely reflect those that have been found in studies examining developmental trajectories of aggression (Pepler, Craig, Jiang, & Connolly, 2008; Xie, Drabick, & Chen, 2011). Across studies,

chronically victimized youth typically experienced greater maladjustment than their peers. This relation has proven robust for various adjustment outcomes, including depression, loneliness, and health problems.

Goldbaum and colleagues (2003) conducted a longitudinal study of 1,241 students in fifth through seventh grade. Participants reported their experiences of general and physical victimization at each of three time points across two years. First, the authors identified trajectories of victimization using a trajectory analysis, and determined that four groups best fit the data: non-victims, desisters, late onset, and stable victims. Goldbaum et al. (2003) found that chronically victimized youth consistently reported the worst outcomes, which included internalizing problems such as higher levels of anxiety and withdrawal, as well as interpersonal difficulties, such as higher rates of peer victimization and lower ratings of social self-competence. Next, the authors identified risk and protective factors of victimization by examining characteristics of the late onset and desister groups. Results showed that, at the initial wave, late onset victims reported as much anxiety and comparably low- quality peer relations as desisters.

It may be that internalizing problems place youth at greater risk of victimization because anxious children are less likely to retaliate or have social support when bullied by others. Additionally, children with fewer close friendships to protect them may be increasingly bullied, and victimized children may be less affectionate and trusting of their friends as a result of their victimization. In contrast, characteristics of the desister group provided insight into protective factors. For instance, this group reported decreasing levels of bullying and aggressive behaviors

over time, which may suggest that students on this trajectory were enacting alternative responses to peer victimization that resulted in less victimization subsequently.

A longitudinal study by Nylund, Bellmore, Nishina and Graham (2007) found significant differences between victimization classes and the development of subsequent depression. Students from 11 urban public middle schools were assessed bi-annually throughout middle school, resulting in six waves of data. Their measure of victimization consisted of six items capturing general, verbal, physical, and relational victimization. They conducted a latent class analysis that suggested a three-class model of victimization with the following classes: victimized, sometimes victimized, and nonvictimized. Students from both victimization classes viewed school as a less safe environment than did non-victims. In addition, the victimized class was significantly more likely to endorse depressive symptoms one semester later across the length of the study, compared to each of the other two classes.

Bradshaw and colleagues (2013) also examined underlying classes in their predominantly Caucasian sample of middle and high school youth. However, these classes were defined based on type of victimization, rather than development over time. As such, three forms of bullying were assessed, including physical, relational, and verbal, with students indicating whether they had experienced any of these forms within the past month. They also reported the frequency of their victimization experiences during the last month. Further, aggression and internalizing problems were assessed using the Aggression Questionnaire and How I Feel – Child Version scale, respectively. Using latent class analysis, the authors found that a four-class model best fit the data for middle school respondents. This included a low victimization/normative class, a high verbal, physical, and relational class, a verbal and relational class, and a verbal and physical

class. For high school respondents, a three-class model fit best and included the same classes as middle school, except for the verbal and physical class.

In comparing the mean scores of aggression and internalizing difficulties across classes, Bradshaw et al. (2013) found that, for middle school and high school, students in the high verbal, physical, and relational class reported the highest levels of aggression and internalizing problems. Students in this class were also victimized more often than those in any of the other classes, indicating particularly detrimental effects of experiencing multiple forms of victimization. Middle school youth in the verbal and physical class also reported greater aggression compared to the verbal and relational class, though these classes had similar levels of internalizing difficulties. Finally, high school students in the verbal and relational class were victimized more often, and reported greater aggression and internalizing problems, than their peers in the low victimization/normative class. Gender differences were also detected, such that middle school girls were more likely to be in the verbal and relational, rather than verbal and physical class. In contrast, boys were more likely to be in the verbal and physical class. The fact that each of these classes reported comparable levels of internalizing problems suggests that relational victimization is as damaging for girls as physical aggression is for boys.

These findings support the need for differentiation between levels of victimization, as highly victimized youth may experience worse outcomes than intermittently victimized and nonvictimized peers. Further, they provide evidence of the far-reaching negative outcomes for students who experience persistent victimization or multiple forms of victimization. Although studies have examined the relation between peer victimization and internalizing problems such as depression, anxiety, and loneliness, no studies were found that considered how different

trajectories of victimization relate to differences in trauma symptoms in youth. Given the previously mentioned research that has demonstrated a clear association between victimization and reports of trauma, this is a gap that must be addressed in order to inform the development of interventions that are more effective at addressing these negative outcomes.

Recent studies have extended this line of research to examine the impact of the timing and duration of peer victimization on the development of maladjustment (e.g., Boivin, Petitclerc, Feng, & Barker, 2010; Kochenderfer & Ladd, 1996a; Kochenderfer- Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). For example, studies have examined whether students who moved from non-victim to victim status reported subsequent increases in maladjustment. Further, they have examined whether stably victimized youth fared worse over time than those who were not victimized or those who experienced time-limited victimization.

Kochenderfer-Ladd and Wardrop (2001) proposed theories to explain the effect of the timing and duration of victimization on adjustment problems. The onset hypothesis and cessation hypothesis have been proposed to account for the effects of the timing of victimization. According to the onset hypothesis, youth who are not initially victimized but become so over time will evince increasing maladjustment, consistent with the increase in their peer victimization experiences. On the other hand, the cessation hypothesis suggests two mechanisms by which a decrease in victimization can affect maladjustment. First, it may be that youth who are initially victimized but no longer experience victimization over time will show significant decreases in maladjustment. This provides support for recovery effects, in which the effects of victimization are time-limited. The alternative is that adjustment problems will persist even after victimization has ceased, providing support for residual effects of peer victimization. In this

case, youth who were initially victimized, but no longer are, will report elevated levels of maladjustment that are maintained across time, despite no longer being victimized.

The life events model and chronic stress models have been proposed to explain the impact of the duration of victimization on internalizing problems (Kochenderfer-Ladd & Wardrop, 2001). The life events model posits that enduring victimization will have the same effect on maladjustment as brief episodes of victimization, and that lasting victimization will trigger maladjustment that continues at the same level rather than increasing over time. This model argues that the duration of victimization is irrelevant such that individuals will experience a similar level of maladjustment regardless of whether they are victimized for a lengthy period of time or just once. In other words, adjustment problems do not necessarily worsen as victimization continues. In contrast, the chronic stress model emphasizes the cumulative impact of victimization on adjustment outcomes. Specifically, youth who are continuously victimized will report greater maladjustment than youth who experience time-limited victimization, as victimization has compounding negative effects.

Although studies have examined the effects of the timing and duration of victimization, they have varied in their approaches to defining victimization trajectories, as well as determining their relation to adjustment outcomes. For instance, in some studies, cutoff scores have been used to assign youth to different trajectories (e.g., Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011), whereas others have used growth mixture modeling techniques (Biggs et al., 2010; Boivin Petitclerc, Feng, & Barker, 2010; Goldbaum, Craig, Pepler, & Connolly, 2003). Additionally, different statistical techniques have been used to test the aforementioned models. For example, Kochenderfer-Ladd and Wardrop (2001) conducted

hierarchical linear modeling to test their hypotheses. However, subsequent research has tended to rely on contrasts between group means at the first and last time points assessed, in order to test these models (e.g., Juvonen, Nishina, & Graham, 2000; Goldbaum et al., 2003; Rueger, Malecki, & Demaray, 2011). In addition to contrasts between groups, Biggs et al. (2010) examined correlations between change factors of victimization and adjustment to test their hypotheses.

Research consistently supports the onset hypothesis, such that children who move from non-victim to victim status evince poorer functioning, including greater loneliness, anxiety, and lower social satisfaction, compared to their nonvictimized peers (Kochenderfer & Ladd, 1996a; Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). For example, in their 2001 study, Kochenderfer-Ladd and Wardrop assessed children from kindergarten through fifth grade. They found that students who moved from nonvictim to victim status reported increasing loneliness and decreasing social satisfaction, as predicted by the onset hypothesis. However, support for the remaining models has been mixed. For instance, with regard to the cessation hypothesis, studies have found evidence of both residual effects of peer victimization, as well as full and partial recovery effects. In a longitudinal study conducted by Kochenderfer and Ladd (1996a), 200 students reported on their experiences of peer victimization, school adjustment, and loneliness during the fall and spring of kindergarten. Four groups were formed based on whether students' victimization scores fell above or below a mean cutoff score at each wave, including fall only, spring only, stable, and nonvictims. As expected, those who were victimized only in the fall exhibited higher rates of loneliness than their nonvictimized counterparts during that season. However, these students continued to exhibit higher levels of

loneliness in the spring of that same year despite no longer being victimized, illustrating the enduring effects of victimization beyond the time period in which it occurred.

Similarly, in a 2011 study, Rueger, Malecki, and Demaray surveyed a sample of 863 seventh and eighth grade students, the majority of whom were White or Latino. Students were assessed once during the fall and again during the spring and reported on the frequency of their victimization experiences. This included physical, relational, verbal, and electronic victimization, which was then combined into a Total Victim score. Students were classified into one of four victimization classes based on whether they scored above or below the top quartile on this measure: nonvictims, fall-only victims, spring-only victims, and stable victims. Participants also reported on their emotional and academic functioning (depression, anxiety, self-esteem, and attitude towards school). The authors found gender differences and residual effects such that girls who were only victimized during the fall continued to exhibit anxiety and depression in the spring of that same year, even after victimization had ended. On the other hand, boys who were only victimized during the fall reported no lasting anxiety or depression during the spring.

There has been further evidence in the literature to support both partial and full recovery effects (e.g., Biggs et al., 2010; Juvonen, Nishina & Graham, 2000; Rueger, Malecki, & Demaray, 2011; Scholte et al., 2007). For instance, Juvonen, Nishina, and Graham (2000) found support for full recovery effects in their study of an ethnically diverse sample of seventh and eighth grade adolescents. Youth were grouped into one of four classes (stable victims, old victims, new victims, and stable non-victims) based on the stability or change in their victimization status across two time points. Groups were established based on whether or not

youth scored above or below the mean score on a measure of victimization. The authors found that students who were victimized only at time one (old victims) displayed levels of self-worth, loneliness, and depressive symptoms comparable to that of their nonvictimized peers at time two. That is, old victims demonstrated full recovery effects and did not report any lasting negative consequences from their experiences of victimization.

Scholte et al. (2007) found similar results in a study of third and fourth grade students in the Netherlands. Students completed measures at two time points that were three years apart. They were classified as victims if their scores on a peer nomination measure of victimization were at least one standard deviation above the mean. Groups that were defined included: stable victims, childhood only victims, adolescence only victims, and non-involved. At the second time point, childhood only victims' scores on measures of shyness and insecurity were comparable to those of non-involved students, suggesting that their functioning returned to normal once victimization had ended. Regarding trauma symptoms, Newman, Holden, and Delville (2005) found support for recovery effects. In their study, college students who reported being frequently victimized prior to high school, but experienced only occasional or no victimization during high school, reported fewer current trauma symptoms than their consistently victimized peers. Gender has also been shown to moderate recovery effects. In Rueger and colleagues' study (2011), for example, although girls showed lingering anxiety and depression, boys who were only victimized during the fall demonstrated full recovery effects, such that they reported levels of anxiety and depression comparable to that of their nonvictimized peers during the spring assessment.

Biggs et al. (2010) also found support for full recovery effects on children's reports of positive affect; however their results were less positive regarding negative affect, such that there was only evidence for partial recovery effects rather than complete recovery. Specifically, Biggs et al. (2010) examined the victimization trajectories of a sample of 1,528 students in third to fifth grade with the goal of determining the relation between each trajectory and negative and positive affect. Participants were drawn from 11 Midwestern elementary schools, and comprised a predominantly Caucasian sample. Measures were administered in the fall and spring of each year, for three years, resulting in six time points. Peer victimization was assessed using a self-report inventory that provided a summary score that included general, overt, and relational victimization. Peer nominations were also completed, which evaluated students' peer reputations as victims of overt or relational aggression. In addition, the degree to which students experienced negative and positive affect within the "past few weeks" was measured via self-report questionnaire. Although affect is not considered an internalizing problem, the authors justified their use of it as an outcome of interest since affective processes underlie both depression and anxiety, in line with the tripartite model of depression and anxiety (Brown, Chorpita, & Barlow, 1998). As such, negative affect may be a risk factor for both anxiety and depression, and lack of positive affect a risk factor for depression.

Biggs et al. (2010) employed growth mixture modeling to derive victimization trajectories, and found a five-group model was the optimal fit based on self-reported victimization. The five trajectories of victimization that were defined included: low, moderate, decreasing, increasing, and chronic. Mean posterior probabilities of group membership ranged from .82 to .95, suggesting fairly precise classification. Next, the authors compared the

decreasing, chronic, and low victimization groups in the fifth grade to determine whether recovery or residual effects of victimization were evident. Findings showed that students in the decreasing group reported levels of positive affect significantly greater than that of the chronic group and comparable to that of the low group. Further, those in the decreasing group reported less negative affect than the chronic group, but greater negative affect than the low group. These results indicate that students who were no longer victimized by fifth grade displayed some improvements in adjustment compared to their stably victimized peers. That is, they demonstrated full recovery effects when positive affect was the outcome of interest. However, this finding was qualified by the fact that the decreasing group's report of negative affect during fifth grade, although lower than that of their chronically-victimized peers, had not yet decreased to the level of students who consistently experienced little victimization.

Goldbaum and colleagues (2003) and Boivin et al. (2010) also used growth mixture modeling to define victimization trajectories. Goldbaum et al. (2003) examined a predominantly European Canadian sample of fifth to seventh grade youth, from diverse economic backgrounds. They determined that four victimization trajectories best fit their data: non-victims, desisters, late onset, and stable victims. Results of their study supported partial and full recovery effects of victimization. For instance, although the desister group reported anxiety higher than that of the non-victim group at the last time point, they reported decreasing levels of anxiety over time, which supports partial recovery effects. On the other hand, the desister group demonstrated full recovery on withdrawal symptoms as assessed by the Child Behavior Checklist, reporting comparable levels as their non-victimized counterparts at the last time point.

Boivin et al. (2010) examined the relation between victimization trajectories and social and emotional difficulties in a socioeconomically diverse sample of Canadian students in third to sixth grade, over four years. They identified three trajectories of victimization: extreme-decreasing, high-increasing, and low-stable. Victimization, social withdrawal, and emotional vulnerability were assessed via peer nomination. Findings showed that, after an initial increase in emotional vulnerability and social withdrawal, the extreme-decreasing group thereafter exhibited decreases on these outcomes, in support of recovery effects. It should be noted that the use of growth mixture modeling in these studies is a significant improvement over previous work in defining victimization trajectories. Rather than using arbitrary cutoff scores to determine class membership, classes were defined based on statistical criteria.

The literature has also been unclear about whether the life events model or chronic stress model better explains the association between the duration of victimization and maladjustment (e.g., Biggs et al., 2010; Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). For example, in their 2010 study, after determining victimization classes using growth mixture modeling, Biggs et al. conducted contrasts to determine whether the impact of victimization on affect was episodic or chronic in nature. The authors compared the level of positive and negative affect across victimization trajectories, in third and fifth grade. They found that youth following the chronic trajectory reported similar levels of negative affect in third grade as youth on the decreasing trajectory but greater negative affect in the fifth grade than all other groups. This provides support for the hypothesis that stable victimization results in greater maladjustment than time-limited victimization, as students in the chronic group reported worse functioning than all groups at the final time point.

Additionally, two studies conducted by Kochenderfer and colleagues examined the impact of the duration of victimization on loneliness among elementary school students drawn from a larger longitudinal project. In their 1996 study, Kochenderfer and Ladd administered self-report questionnaires measuring peer victimization, loneliness, and school avoidance to a primarily Caucasian sample of kindergarteners. Students were assessed twice within the year, once in the fall and again during the spring. Using cutoff scores, results showed that almost 9% of students were chronically victimized across the school year, forming a stable victim group. The other three groups that emerged were fall-only victims, spring-only victims, and nonvictimized youth. The authors found support for the chronic stress model in that chronically victimized youth reported increasing loneliness and decreased school liking across time, suggesting that maladjustment is compounded by persistent victimization. Spring-only victims also experienced increasing loneliness and decreased school liking from fall to spring. In contrast, fall-only victims reported similar levels of loneliness in fall and spring, which shows that certain indicators of adjustment continued to suggest poor functioning even after victimization had ended.

Kochenderfer-Ladd and Wardrop (2001) expanded the scope of their previous study to determine the impact of the timing and duration of victimization on adjustment in a four-year longitudinal study of youth from kindergarten to third grade. Children reported the frequency of their victimization experiences (general, verbal, and physical) and their levels of loneliness and social satisfaction, at each of four time points. Although loneliness and social satisfaction do not represent internalizing problems, they assess adjustment in regards to peer relations, which is likely to be linked to internalizing difficulties like depression and anxiety, particularly for youth

who are being victimized by their peers. Children were classified as victims or non-victims at each time point depending on whether they fell above or below a z-score of 0.5 on the mean victimization score. This resulted in 16 distinct trajectories across time. The authors found that the majority of students were not chronically victimized, with 4% to 14% of participants meeting criteria for stable victimization, depending on whether this was defined as victim status across four or three time points, respectively. This suggests that stable victimization was a relatively uncommon experience for most children within this sample. For chronic victims, different trajectories of maladjustment emerged for loneliness and social satisfaction. The trajectory for social satisfaction was consistent with a chronic stress model whereas the course for loneliness supported the life events model. That is, chronic victims displayed a decreasing trajectory of social satisfaction over time, in line with the chronic stress model, which indicates that these students were not initially dissatisfied with their peer relations, but rather, that this pattern emerged only after victimization experiences had accrued. Unlike the findings from the previous study (Kochenderfer & Ladd, 1996a), which showed that loneliness increased over time for stable victims, results from this study indicated that chronically victimized youth maintained a consistently high level of loneliness over time, supporting the life events model.

Rueger et al. (2011) also found support for the life events model in their aforementioned study of suburban middle school students. Results showed that symptoms of anxiety and depression did not significantly increase between assessments for youth who were stably victimized. This finding was robust across gender and suggests that boys and girls who were stable victims exhibited consistently high rates of psychosocial maladjustment across waves. Self-esteem of stable victims also did not significantly decrease between assessments, instead

remaining consistently low across the study, providing further support for the life events model. Findings from Scholte et al. (2007) provided further support for the life events model, in that youth who were classified as stable victims reported levels of social adjustment (being liked/disliked, shyness, insecurity) comparable to the adolescence-only victim group during adolescence. This indicates that the duration of victimization did not result in decreased functioning over time, but instead, produced maladjustment that was similar to students experiencing time-limited victimization. Results are consistent with the argument that the duration of victimization was irrelevant to the levels of maladjustment reported.

In sum, important research has been conducted examining the impact of the timing and duration of victimization in predominantly Caucasian samples of younger school-age children. However, it is unclear whether these same patterns would hold for adolescents or for more ethnically diverse populations. Moreover, few longitudinal studies have examined the impact of peer victimization on trauma symptoms; instead, they have primarily focused on outcomes such as depression, anxiety, and affect. Finally, none of the studies reviewed here differentiated between overt and relational forms of victimization when examining their impact on adjustment. Rather, composite measures of victimization were used, which combined students' responses regarding their various victimization experiences.

### **Mechanism of Relation between Victimization and Internalizing Problems**

A number of theories have attempted to account for the relation between victimization and subsequent maladjustment, particularly internalizing difficulties. One such explanation derives from Crick and Dodge's (1994) seminal work on social-information processing (SIP), which states that victimization experiences inform the way youth subsequently evaluate

themselves and others. Based on this model, individuals proceed through a series of steps when confronted with social stimuli in order to determine an appropriate course of action. First, they encode and interpret situational cues. This includes decoding attributions of intent and trying to understand why certain events have occurred. Once individuals have organized their understanding of the situation, they formulate their goals for that given situation. Next, they retrieve and/or generate potential responses that can be used to achieve their goals. In the following step, youth evaluate their potential responses based on their self-efficacy for performing each response and their outcome expectancies in terms of how effective they believe a particular response will be in achieving their goals. Finally, individuals choose a response to enact.

Applying the SIP framework to victimization and maladjustment, it is hypothesized that a cyclical relation develops between these constructs. That is, youth who are repeatedly victimized may incorporate these victimization experiences into their own self-concept, their view of others, or both. Specifically, adolescents may come to believe that their experiences are reflective of how they deserve to be treated, resulting in internalizing problems, or they may begin to attribute negative or hostile intentions to others, resulting in externalizing or oppositional behavior. Further, maladjusted youth typically have a limited cache of responses, many of which are maladaptive rather than prosocial. This may be due to the fact that such youth have had few positive social experiences from which to learn adaptive responses. As a result, they may enact poor responses in situations, thereby exacerbating their victimization and resulting in a stabilization of their victim status and maladjustment (Crick & Bigbee, 1998).

Research has shown that attributions play a pivotal role in victimization and may determine what types of adjustment problems subsequently develop (Graham & Juvonen, 1998; Ladd & Troop-Gordon, 2003; Prinstein, Cheah, & Guyer, 2005; Troop-Gordon & Ladd, 2005). Troop-Gordon and Ladd (2005) explored this model in depth by examining whether self- and peer-beliefs mediated the relation between peer victimization and internalizing difficulties. Their research is unique in that it distinguishes between the effects of children's self-concepts and children's views of their peers. Their findings demonstrated that both self- and peer-perceptions functioned as independent mechanisms to explain the association between initial victimization and later maladjustment. The authors included both internalizing and externalizing variables as outcomes and found that the relation was stronger for the former. This suggests that attributions captured a greater amount of variance for internalizing problems than they did for externalizing difficulties.

Similarly, Grills and Ollendick (2002) examined whether the relation between peer victimization and anxiety was mediated by global self-worth. Their sample consisted of sixth grade students at a southern middle school, the majority of whom were Caucasian from moderate SES families. The authors predicted that girls who experienced peer victimization would incorporate these negative experiences into their self-concept, identifying it as an attack against their character. This would lead to higher levels of anxiety, given the importance of peer relations and evaluations at this developmental stage. Specifically, it was speculated that girls would become more anxious in anticipation of future instances of peer interaction that could potentially involve further negative evaluations. Results supported this hypothesis such that global self-worth mediated the relation between peer victimization and anxiety in girls. This

finding did not hold for boys, however, which suggests that this pathway uniquely captures girls' experiences of peer victimization.

McLaughlin, Hatzenbuehler and Hilt (2009) also proposed that impaired emotion regulation skills mediated the relation between victimization and internalizing problems. Their study consisted of a racially diverse sample of 11-to-14 year old adolescents from two middle schools in the eastern United States. Students were administered measures at three time points, three to four months apart. McLaughlin and colleagues (2009) then created a latent variable capturing emotion dysregulation using students' ratings of rumination, dysregulated anger and sadness, and lack of emotional understanding. Internalizing symptoms were defined as a composite of children's self-report ratings on anxiety and depression measures. Results indicated that emotion dysregulation mediated the association between relational victimization and subsequent internalizing problems for boys and girls. As relational victimization increased, so did emotion dysregulation, which accounted for the rise in subsequent internalizing difficulties. Notably, emotion dysregulation did not account for the association between overt victimization and later internalizing symptoms, suggesting another mechanism is responsible for the influence that overt victimization exerts on adjustment difficulties.

Another theory that has been applied to youth victimization is general strain theory (Agnew, 1992), which posits that stressful events are positively related to delinquency and are partially fueled by feelings of frustration or anger (Hay, Meldrum, & Mann, 2010). According to general strain theory, youth who experience one of three types of strain are likely to resort to delinquency as a coping response: being prohibited from achieving positively valued goals, being threatened with, or experiencing, the removal of positively valued stimuli, and having

negative stimuli introduced (Wallace, Patchin, & May, 2005). These experiences of strain are likely to result in negative emotions that increase the likelihood of deviance.

Traditionally, general strain theory has examined whether stressors predict higher involvement in externalizing behaviors such as aggression against others or property crimes, but Hay and colleagues (2010) extended this theoretical framework to capture “internalizing deviance” as well. The authors defined this as suicidal ideation and nonlethal self-harm, such as cutting or burning – behaviors that have been linked to more traditional notions of internalizing problems, most notably depression. Their sample consisted of 400 high school and middle school youth (ages 10 to 21) located in the rural southeastern United States. Results indicated that both traditional victimization (physical and verbal) and cyber-victimization were significantly associated with internalizing problems. In fact, the link between victimization and internalizing difficulties was stronger than that between victimization and externalizing problems. It may be that peer victimization causes students to withdraw from social interactions and their peers, isolating themselves and removing the opportunity for aggressing against others. As a result, much of their frustration is directed at the self, manifesting as internalizing problems. However, this study is limited in that the authors failed to assess strain as a mediator; rather, they used general strain theory as a framework to potentially explain the association between victimization and internalizing difficulties.

The community violence literature provides an explanation for the development of PTSD following peer victimization. Community violence has been defined as deliberate acts intended to cause harm against persons in the community (Cooley-Strickland et al., 2009), with both direct and indirect victims. That is, community violence does not simply affect those involved in

the altercation but also impacts bystanders and witnesses who may experience anticipatory anxiety of future violence. As such, it represents a more pervasive concern compared to isolated instances of victimization. Studies have shown that repeated exposure to community violence can exacerbate neurotransmitter activity that is associated with aggression and hyperarousal - characteristics of PTSD (Cooley-Strickland et al., 2009). Bullying, like community violence, can be viewed as engendering a hostile climate for victims at school. Therefore, these findings can be extrapolated to youth who are chronically victimized by their peers, predicting heightened arousal and distress in the face of repeated bullying.

Cognitive theories of trauma may also account for the relation between victimization and the development of PTSD in adolescents. For instance, one widely accepted theory is Janoff-Bulman's theory of shattered assumptions (1989), which states that traumatic events may be incongruous with individuals' prior beliefs about the world, themselves, and others. These beliefs include the just-world belief wherein one holds that bad things only happen to bad people, notions of self-worth and personal invulnerability, and beliefs about others, including whether or not they intend to cause harm (Rodríguez-Muñoz, Moreno-Jiménez, Vergel, & Hernández, 2010).

Rodríguez-Muñoz et al. (2010) explored this theory with workplace bullying in a sample of 366 adults in Spain, half of whom experienced victimization in the workplace and half of whom did not. Participants completed measures assessing the frequency of their workplace bullying experiences, including social isolation and unfair demands, symptoms of PTSD, and basic assumptions about the world and themselves (i.e., "The world is a good place" and "I am basically a lucky person"). Results showed that, not only was workplace bullying associated

with PTSD symptoms, but victims of bullying reported much more negative worldviews compared to their nonvictimized counterparts. For example, victims viewed the world as less benevolent and evaluated themselves more critically, in line with a cognitive approach to understanding the development of trauma symptoms in victimized youth. As such, peer victimization may increase rates of PTSD by priming chronically victimized youth to constantly be prepared for a threatening situation (Dunmore, Clark, & Ehlers, 2001). Chronic victims may demonstrate selective attention bias to fear-relevant cues in any given situation, whether or not it is objectively dangerous, as a result of their repeated victimization experiences. Selective bias and hyper-awareness are symptoms of PTSD that may cause youth to constantly feel at risk or on-edge.

Finally, the theory of learned helplessness has been provided as another explanation of the development of PTSD following bullying and victimization. Abramson, Seligman, and Teasdale (1978) stated that learned helplessness occurs when individuals realize that they have no control over outcomes, resulting in three types of deficits: cognitive, motivational, and emotional. They argued that exposure to an uncontrollable situation is not enough to trigger helplessness; rather, it requires the realization that one's actions are futile and the expectation that the situation will remain uncontrollable. This results in motivational deficits, such that the initiation of responses to alter the situation is inhibited due to the belief that one has no control over outcomes, cognitive deficits, whereby victims fail to learn that responses *can* produce desired outcomes, and emotional deficits such as higher rates of depression. Matthieson and Einarsen (2004) proposed that individuals who are repeatedly victimized are at risk of developing a sense of learned helplessness, particularly if they are unable to leave the

environment in which victimization occurs. This is particularly relevant to peer victimization within the school setting, as victimized youth must often continue attending school with the same aggressors and with little possibility of escaping these negative circumstances. Over time, victims may come to believe that they have little power over their fate, resulting in persistent anxiety and hyperarousal, avoidance of school, and/or recurrent thoughts or fears about past instances of victimization.

### **Statement of the Problem**

Peer victimization is a widespread phenomenon that has been shown to negatively impact youth across various domains of functioning. Studies have consistently demonstrated an association between victimization and behavioral problems, academic performance, and health. Victimization has also been shown to be associated with internalizing problems, such as depression, loneliness, anxiety and posttraumatic stress. However, certain gaps exist in the literature with regards to peer victimization and the negative sequelae that follow. First, the majority of studies have examined depression, loneliness and anxiety as outcomes of victimization, with few studies examining the influence of victimization on trauma symptoms and distress. Although studies have examined this relation cross-sectionally and found a correlation between victimization and PTSD symptoms, few longitudinal studies have examined this association over time in adolescence.

Understanding the link between peer victimization and PTSD symptoms, in particular, is important because certain characteristics of chronic victimization, such as feelings of helplessness and acute anxiety, are criteria for PTSD (Storch & Esposito, 2003). The present study sought to address this gap in the literature by examining the relation between longitudinal

patterns of adolescents' reports of peer victimization and their reports of trauma symptoms. Previous research has also typically used aggregate measures of victimization that combine reports of physical, verbal, relational, and general victimization into a single construct. This approach may obscure different patterns of relations that emerge between various forms of peer victimization and internalizing difficulties. For that reason, the impact of physical victimization and relational victimization on trauma symptoms in adolescents was examined separately in the current study.

Another limitation of previous research is that the majority of studies have focused predominantly on younger samples and less is known about how trajectories of victimization influence adjustment patterns during adolescence. The present study contributes to the literature by exploring peer victimization during this critical period of children's lives (middle school), which is characterized by increasing peer interactions and influence. A greater understanding of the relation between victimization experiences and adjustment within this age group may enhance current knowledge by indicating whether these processes remain stable over time and whether trajectories differentially influence maladjustment in older youth. This can be used to inform prevention programs by providing researchers with a better understanding of which victimized students to select for intervention or how to structure violence prevention efforts to optimize youth well-being. For instance, if different patterns of association between victimization and maladjustment emerge for different age groups, researchers should tailor prevention efforts for specific age groups. It may be that younger children are more resilient and experience no lasting negative effects (i.e., recovery effects) from victimization, whereas older youth continue to exhibit poorer functioning even after victimization has ended. If this is the

case, simply stopping victimization may not be enough to curb maladjustment in middle school students who experience chronic victimization. This also suggests that violence prevention researchers may need to go beyond strategies to reduce bullying and school victimization in general by enhancing psychosocial supports to help chronically victimized youth cope with their lingering depression, anxiety, or distress.

An additional issue is that the majority of studies have been conducted with Caucasian youth (e.g. Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). Failure to include more ethnic minority participants limits the generalizability of prior findings, precluding broader statements about how victimization and maladjustment are related for adolescents. In contrast to previous research, the sample in the present study was composed primarily of African-American, low-income youth. Examining the impact of victimization trajectories on posttraumatic stress within this typically underserved population provides a basis for determining the generalizability of prior findings across ethnicity. Furthermore, the salience of victimization in the lives of many urban, inner-city youth warrants greater investigation in order to gain a better understanding of a phenomenon that is highly relevant to this population.

Much of the previous longitudinal research examining victimization and internalizing difficulties involves assessments that are separated by long intervals of time ranging from every six months to every year (Biggs et al., 2010; Boivin, Petitclerc, Feng, & Barker, 2010; Kochenderfer-Ladd & Wardrop, 2001). Few studies have examined victimization or maladjustment within a given school year, potentially missing changes across a shorter period of time. The current study contributes to the existing literature as assessments were administered after shorter intervals; namely, every three months. Data were consequently available for every

season which provided an opportunity to examine the victimization-trauma relation within a school year.

Consistent with most other studies that have examined the relation between victimization and adjustment, the current study assessed victimization and distress based on self-report. Self-report may provide a more accurate indicator of youth's experiences, particularly for adolescents. Teacher reports are typically more accurate when children are younger because teachers have more contact with younger students. During middle school, however, teachers may be less adept at identifying victims, underreporting half of those students classified as victims by their peers (Leff, Kupersmidt, Patterson, & Power, 1999). Self- and peer-reports may therefore be more accurate indicators of adolescents' victimization experiences.

Finally, past studies have relied heavily on cutoff scores to classify participants into victimization classes (e.g., Juvonen, Nishina, & Graham, 2000; Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). Use of these cutoffs has been criticized for allowing researcher subjectivity to determine the point at which groups differ, and how many victimization groups are appropriate (Nylund, Bellmore, Nishina & Graham, 2007). In addition, the arbitrariness of this method makes it difficult to compare results meaningfully across studies, as different criteria are used to define classes (e.g., above the mean, 0.5 SD above the mean, etc.). This may contribute to differences in findings across studies. In contrast, statistical techniques such as growth mixture modeling or latent class analysis can be used to determine the patterns and number of classes that best fit the data (Nylund, Asparouhov, and Muthén, 2007). These analyses provide an empirical basis for identifying classes of students that exhibit similar trajectories of victimization. Using these methods generates groupings based on statistical rather

than subjective decision rules that vary from study to study. The current study used growth mixture modeling rather than cutoff scores in attempting to define victimization groups.

The goal of the present study was to examine the relation between victimization trajectories and posttraumatic stress symptoms in low-income, minority adolescents. Addressing this question provides greater information regarding how victimization develops over time for this population, whether classes with distinct trajectories of victimization emerge, and how they relate to youth ratings of distress. Due to the mixed findings in the extant literature regarding the impact of the duration and timing of victimization on maladjustment, the goal was to test competing models based on the onset hypothesis, the competing life events and chronic stress models, as well as the recovery versus residual effects hypotheses. Based on the current literature and theory regarding peer victimization patterns and their relation to adjustment difficulties, the following hypotheses were considered:

*Hypothesis 1.* Four trajectories of victimization will be found: Chronic, Increasing, Decreasing, and Low/Nonvictimized.

*Hypothesis 2.* Based on the onset hypothesis, youth who are on an increasing trajectory of victimization will report significant increases in trauma symptoms over time.

Two competing hypotheses regarding patterns of trauma symptoms for students on a decreasing trajectory of victimization were tested:

*Hypothesis 3a.* Based on the recovery hypothesis, youth who follow a decreasing trajectory of victimization will report significant decreases in distress over time.

*Hypothesis 3b.* Based on the residual effects hypothesis, youth who follow a decreasing trajectory of victimization will report consistently elevated levels of distress across time.

Two competing hypotheses regarding patterns of trauma symptoms for students on a chronic trajectory of victimization were tested:

*Hypothesis 4a.* Based on the chronic stress model, chronically victimized youth will report increasing levels of distress over time.

*Hypothesis 4b.* Based on the life events model, chronically victimized youth will report consistently elevated levels of distress over time.

## **Method**

### **Participants**

This study was conducted through secondary analysis of longitudinal data from a larger study examining the impact of a comprehensive youth violence prevention program in schools within a large city in the southeastern United States. Data collection began in 2010 as part of a multiple-baseline design that involved collecting data over the course of five years from students in three high-risk communities. The three participating communities were defined by middle school attendance zones and were chosen based on examination of community violence surveillance data, reviews of currently available youth resources in the community, and meetings with community partners. Communities were selected to be comparable in terms of risk, resources, and location. The three middle schools whose attendance zones defined these communities had student bodies consisting of between 435 to 615 students, most of whom were African American (78% to 96%). The majority of students at these schools came from families with low socioeconomic status based on the percentage of students eligible for free or reduced lunch, which ranged from 76% to 89%. Weapons incidents and offenses against students, school staff, and others were high across all three schools included in the final sample. These rates of

violence-related discipline incidents ranged from 37 to 40 per 100 students during the 2008 to 2009 school year.

## **Procedure**

Active parental consent and student assent were obtained. Data were collected every three months beginning in the winter of 2010 using computer-administered surveys of a random sample of students at each school. The sampling strategy consisted of randomly selecting 821 students from the rosters of all three grades of the middle schools in Year 1. Of these 821 students, 669 provided parental consent and student assent, for a participation rate of 81%. Each student was randomly assigned to complete the survey at two of the four waves each year they participated to reduce participant burden. Participating students remained eligible until they left middle school or declined to participate further. Eighth graders who moved on to high school were replaced with a sample of approximately 210 incoming sixth graders randomly selected from the school rosters. Similarly, students who left the schools for other reasons were replaced with a randomly selected sample of students drawn from other students in the same grade. Surveys were administered during the school day for assessments during the school year and in participants' homes or another community location during the summer waves of data collection. Data were collected using computer-assisted self-administered surveys and each student was assigned a unique identification number to link data across waves. Participants were compensated with a \$10 gift card for each assessment that they completed.

The current study was based on data obtained from students from the fall of their sixth grade through the fall of their seventh grade school years, encompassing five waves of data collection. The rationale for this focus was that it provided complete coverage of one school

year, allowing for a more time-intensive examination of the relation between victimization and trauma than has previously been possible. Participants were 684 sixth and seventh grade students who completed surveys at least once between the fall of sixth grade and the fall of seventh grade, during years one through three of the broader project. Covariance estimates were based on 32% to 49% of all cases, across the five waves of the study. The total sample was approximately 48% male, and predominantly African American (70%). Approximately 7% of participants reported their race as White, and 12% as multiracial.

## **Measures**

Students completed a survey containing a variety of measures of problem behaviors, dating violence, and exposure to violence. The current study focused on measures of the frequency with which respondents experienced physical and relational victimization within the past month and their frequency of distress symptoms within the past six months.

**Victimization.** Victimization was assessed by the Problem Behavior Frequency Scale – Revised (PBFS-R). The PBFS-R is based on a measure developed by Farrell, Kung, White and Valois (2000) that includes two subscales that measure the frequency with which students experienced physical and relational victimization. Several items from the relational victimization scale were adapted from the Social Experiences Questionnaire (Crick & Grotpeter, 1996). The physical and relational victimization subscales consist of five and six items, respectively. Students rated how often they had been victimized within the past 30 days on a six-point scale from *Never* to *20 times or more*.

Examples of items assessing physical victimization include “Someone threatened to hit or physically harm you” and “Someone hit you hard enough to hurt.” The relational victimization

subscale included items such as “Someone made fun of you to make others laugh” and “Someone spread a false rumor about you.” Both subscales have adequate internal consistency, with alphas ranging from .67 to .87 based on the first six waves of data collection. The PBFS-R has been used in prior research evaluating violence prevention programs and has shown high internal reliability (e.g., Miller-Johnson, Sullivan, Simon, & The Multi-Site Violence Prevention Project, 2004).

**Trauma Symptoms.** The Checklist of Children’s Distress Symptoms (CCDS) (Richters & Martinez, 1990) was used to assess how often respondents experienced distress within the past six months, using a five-point scale ranging from *Never* to *Most of the time*. Internal consistency of the CCDS is acceptable (ranging from .62 to .79) and the measure is well-validated, demonstrating convergent validity with the Child Depression Inventory (Kovacs, 1985). Moreover, the scale was specifically designed to assess distress in youth who are exposed to community violence (Richters & Martinez, 1990). The CCDS consists of 28 items and is based on diagnostic criteria for Posttraumatic Stress Disorder (PTSD) as outlined in the DSM-III. Examples of items include “How often do you have bad dreams or nightmares?” and “How often do you feel like something bad or frightening from the past is happening all over again?”

### **Data Analysis**

All analyses were conducted using Mplus Version 7.11 statistical software (Muthén & Muthén, 1998-2012) which allows for the use of all available data, including cases with missing data, through full information maximum likelihood estimation. Unconditional latent growth models were first estimated to determine the shape that best fit the data. Latent growth modeling is a statistical approach that tests models that use different sets of parameters to represent

changes over time, as a function of an initial level (intercept) and changes over time (Duncan & Duncan, 2004). This approach allows for a parsimonious and accurate depiction of individual differences in growth trajectories.

Intercept-only, linear, and quadratic models were examined for each form of victimization. Because chi-squared tests can be misleading, given that large samples may result in significant p-values for minor derivations from a perfect fit, other fit indices were used to evaluate model fit (Cheung & Rensvold, 2002). The fit indices used in the current study included the root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI). CFI and TLI values of .95 or greater and RMSEA values of .06 or smaller indicate a good fit (Hu & Bentler, 1999).

After establishing the shape of the growth models for physical and relational victimization, growth mixture models were estimated to test the study's hypotheses. Growth mixture modeling is a person-centered approach that attempts to classify individuals into homogenous groups that display similar patterns of change over time (Jung & Wickrama, 2008). Conventional growth modeling provides a single growth trajectory based on the assumption that variations in individuals' patterns of change over time can be represented by random effects representing variation in the intercepts and slopes of their growth curves. This allows for a single growth model to represent all individuals' growth trajectories. As such, this approach assumes that individuals within a sample are drawn from a single population with similar parameters. The advantage of growth mixture modeling, on the other hand, is that it allows for individuals to be classified into groups based on similar patterns of change. As a result, distinct trajectories for each latent class can be determined, rather than having one representative growth

model for all individuals within a sample. Within the present study, a series of growth mixture models were run to determine whether distinct groups could be defined for physical victimization and relational victimization. Models with increasing numbers of classes were tested, using fit indices and a likelihood ratio test to determine optimal fit.

Finally, covariates were added to the growth models to determine the predictive ability of physical and relational victimization on changes in distress over time. That is, these models were run in order to test hypotheses by relating growth models of victimization to changes in trauma symptoms. Gender and trauma symptoms in the fall of sixth grade were also included in the models to control for their influence. In these growth models, trauma symptoms in the fall of seventh grade were regressed on gender, trauma symptoms in the fall of sixth grade, and the appropriate growth factors (intercept, slope, and quadratic factors).

## **Results**

### **Descriptive Statistics**

The means and standard deviations for all scales used in the present study are reported in Table 1. Trauma symptoms are only reported for the first and last waves because responses at those waves were the only ones considered in determining change over time in student report of trauma symptoms.

Table 1

*Means and Standard Deviations for Measures of Victimization and Trauma Symptoms by Wave*

Variable	<u>6<sup>a</sup>-Fall</u>		<u>6<sup>a</sup> -Winter</u>		<u>6<sup>a</sup> -Spring</u>		<u>6<sup>b</sup> -Summer</u>		<u>7<sup>c</sup> -Fall</u>	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Physical Victimization	1.40	.60	1.34	.62	1.32	.60	1.26	.53	1.30	.64
Relational Victimization	1.47	.80	1.44	.71	1.37	.68	1.29	.61	1.28	.58
Trauma Symptoms	2.08	.76	--	--	--	--	--	--	1.95	.79

*Note.*  $N = 684$

<sup>a</sup>Data collected during sixth grade school year. <sup>b</sup>Data collected in summer following sixth grade.

<sup>c</sup>Data collected during seventh grade school year.

### **Correlations among Measures**

Table 2 shows correlations among measures of physical victimization, relational victimization, trauma symptoms, and gender across waves. Correlations between physical victimization and relational victimization at the same time point were consistently large according to Cohen's (1992) criteria ( $r$  values ranged from .73 to .79). Physical and relational victimization were also fairly stable based on correlations between adjacent waves (i.e.,  $r_s = .60$  to .81 for physical victimization and .65 to .85 for relational victimization). Of note, stability coefficients were particularly high between the spring and summer waves, for both physical and relational victimization. Physical victimization and relational victimization during the fall of sixth grade were also highly related to the concurrent measure of trauma symptoms ( $r_s = .54$  and .45, respectively). Similarly, victimization and trauma symptoms during the fall of seventh grade were highly related ( $r_s = .43$  and .44 for physical and relational victimization, respectively). Trauma symptoms reported during the fall of the sixth and seventh grade were also highly correlated ( $r = .56$ ).

Table 2

*Stability Coefficients and Correlations Among Physical Victimization, Relational Victimization, and Trauma Symptom Across Waves*

Variable	1	2	3	4	5	6	7	8	9	10	11	12
<u>Physical Victimization</u>												
1. Fall of 6th grade	-				.							
2. Winter of 6th grade	.60	-										
3. Spring of 6th grade	.61	.68	-									
4. Summer of 6th grade	.22	.34	.81	-								
5. Fall of 7th grade	.22	.53	.55	.74	-							
<u>Relational Victimization</u>												
6. Fall of 6th grade	.79	.62	.35	-.05	.06	-						
7. Winter of 6th grade	.45	.73	.47	.25	.40	.70	-					
8. Spring of 6th grade	.40	.69	.79	.59	.45	.29	.65	-				
9. Summer of 6th grade	.17	.28	.69	.76	.47	-.08	.38	.85	-			
10. Fall of 7th grade	.12	.49	.57	.63	.74	-.05	.49	.62	.65	-		
<u>Children's Distress Scale</u>												
11. Fall of 6th grade	.54	.46	.39	.29	.29	.45	.36	.37	.26	.35	-	
12. Fall of 7th grade	.33	.30	.44	.45	.43	.19	.33	.38	.46	.44	.56	-
13. Male gender	.07	.05	.02	.03	.04	.03	-.08	-.05	-.06	-.02	-.22	-.20

Note.  $N = 684$ .

## Unconditional Growth Models

The first step in the analysis was to determine the shape of growth curves that best represented changes in physical and relational victimization over time. Missing data were handled with full information maximum likelihood analysis, which included all cases with at least one wave of data. The maximum likelihood estimator with robust standard errors (MLR) was used in these analyses. It is a maximum likelihood parameter estimate with standard errors and a chi-square test statistic that are robust to non-normality of the data.

Estimating the unconditional growth models involved comparing the fit of (a) an intercept-only model that assumed levels of victimization could be represented by an overall mean; (b) a linear growth model representing change in victimization over time as a function of an intercept, representing the level at Wave 1, and a linear slope coefficient that represented the change across waves; and (c) a quadratic model in which change in victimization over time was represented as a function of an intercept, a linear slope coefficient, and a quadratic coefficient representing curvilinear change across waves. These were unconditional models in that they estimated changes in victimization over time, without the inclusion of covariates in the model. Model fit was compared using the Satorra-Bentler scaled difference test, which is an adjusted chi-square test statistic that takes into account non-normality of the data. Several fit indices were also considered; specifically, the CFI, the TLI, and the RMSEA.

**Physical victimization.** The intercept-only model for physical victimization did not fit the data well ( $\chi^2 (17, N = 684) = 19.87, p = .28, CFI=.900, TLI=.941, RMSEA=.016$ ). In contrast, the linear model for physical victimization fit the data very well ( $\chi^2 (14, N = 684) = 10.76, p = .71, CFI=1.000, TLI=1.081, RMSEA=.000$ ; see Table 3), and significantly improved

model fit relative to the intercept-only model ( $\Delta\chi^2_{SB} = 16.57, p < .001$ ). Figure 1 depicts the observed and predicted means for the linear model for physical victimization across waves. In this model, the predicted mean intercept factor was 1.37 and had significant variance ( $\tau = .27, p < .001$ ), which indicates that there were individual differences in initial levels of physical victimization in the sample. The mean slope factor of  $-.09$  suggests that, on average, physical victimization decreased over time. Significant variance of the slope parameter ( $\tau = .32, p = .016$ ) also indicates that there were significant individual differences in these trajectories over time.

Table 3  
*Summary of Latent Growth Curve Models*

Model	$\chi^2$	df	<i>p</i>	CFI	TLI	RMSEA
<u>Physical Victimization</u>						
Intercept-only	19.87	17	.28	.900	.941	.016
Linear	10.76	14	.71	1.000	1.081	.000
Linear with covariates <sup>1</sup>	-	-	-	-	-	-
<u>Relational Victimization</u>						
Intercept-only	62.33	17	< .001	.661	.801	.063
Linear	34.54	14	.002	.846	.890	.046
Quadratic	16.28	10	.09	.953	.953	.030
Quadratic with covariates	23.86	18	.16	.978	.967	.022

*Note.* CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation.

<sup>1</sup>Fit indices for this model were not reported because the standard errors for the H1 estimated sample statistics could not be computed.

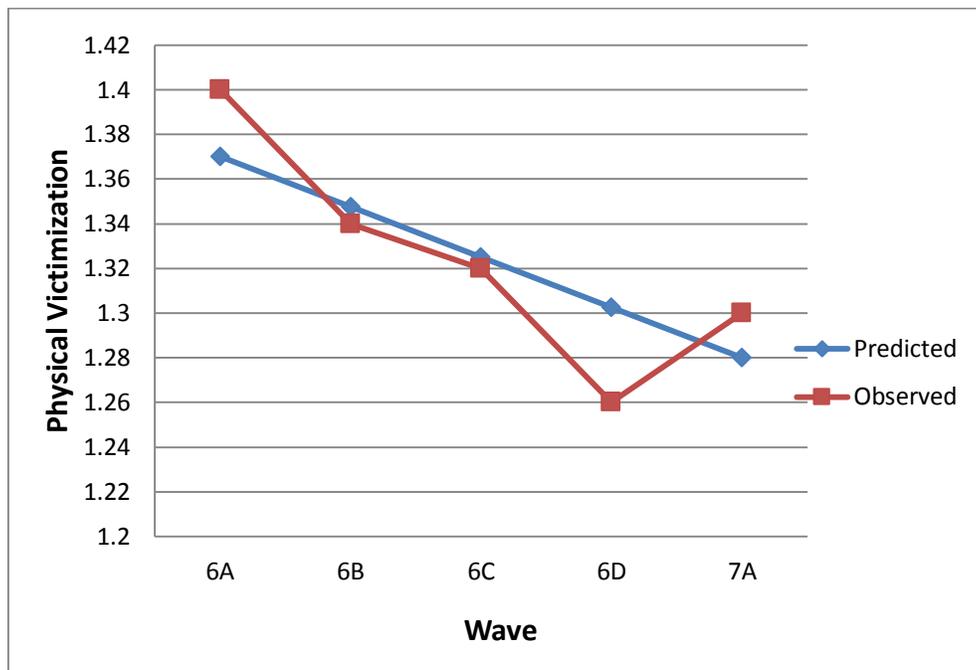


Figure 1. Observed and predicted means on the physical victimization scale at each of five time points assessed.

**Relational victimization.** The intercept-only model for relational victimization fit the data poorly ( $\chi^2(17, N = 682) = 62.33, p < .001, CFI=.661, TLI=.801, RMSEA=.063$ ; see Table 3). Although the linear model for relational victimization improved model fit compared to the intercept-only model ( $\Delta\chi^2_{SB} = 22.05, p < .001$ ), it also fit the data poorly ( $\chi^2(14, N = 682) = 34.54, p = .002, CFI=.846, TLI=.890, RMSEA=.046$ ; see Table 3). In contrast, the quadratic model for relational victimization fit the data well ( $\chi^2(10, N = 682) = 16.28, p = .09, CFI=.953, TLI=.953, RMSEA=.030$ ; see Table 3). Compared to the linear model, the quadratic model significantly improved fit ( $\Delta\chi^2_{SB} = 17.83, p < .001$ ). Figure 2 shows the observed and estimated means for relational victimization over time. In this model, the predicted mean intercept factor was 1.50, and the variance was significant ( $\tau = .61, p = .003$ ), which suggests significant individual differences in baseline levels of relational victimization within this sample. The value

of the slope was  $-.30$ , though the variance of this factor was not significant. The variance of the quadratic factor was also not significant.

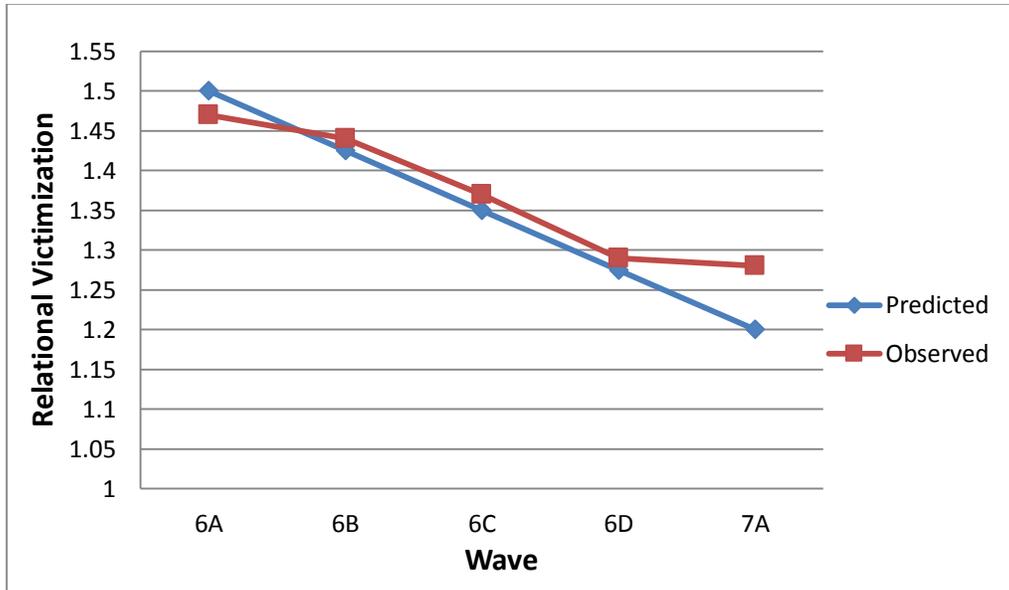


Figure 2. Observed and predicted means on the relational victimization scale at each of five time points assessed.

### Growth Mixture Models

In order to address the first aim of the study, a series of growth mixture models was examined for physical and relational victimization, with each model specifying an increasing number of classes. The purpose of these analyses was to determine if the individual differences in growth parameters for each model could be captured by identifying clusters of adolescents with similar patterns of change over time. To this end, victimization at each wave from the fall of sixth grade through the fall of seventh grade was entered into a mixture model, using the MLR estimator and 500 random starts. As stated previously, the MLR estimator is a maximum likelihood parameter estimate that is robust to non-normality of the data. Random starts are sets of starting points that are chosen at random when sampling from a given population. The Mplus

software default is 20 random starts, but this value was increased to 500 in order to increase the likelihood of finding an accurate solution. In the growth mixture model with relational victimization, variance of the quadratic factor was also fixed to zero. This is a common approach used to aid in convergence of the model (Jung & Wickrama, 2008). To determine the optimal number of classes in these growth mixture models, the Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test was considered, consistent with recommendations in the literature (Wang & Bodner, 2007). Increasing numbers of classes were run and compared using the VLMR, which compares the fit of a current model with  $K$  classes to that of a model with one fewer class ( $K-1$  classes). A significant  $p$ -value indicates that the  $K$ -class model is a better fit. Model fit was also compared using the Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-size adjusted Bayesian information criterion (saBIC). Lower values of these coefficients indicate better fit.

**Physical victimization.** For physical victimization, the one-class solution fit the data best. Although the values of the AIC, BIC, and saBIC for the two-class solution were lower than that of the one-class solution, the VLMR test for the two-class model showed no significant improvement in fit ( $-1008.58$ ;  $p = .06$ ; see Table 4). This finding did not support Hypothesis 1 which predicted four trajectories of physical victimization over time (chronic, increasing, decreasing, and low/nonvictimized).

Table 4  
*Physical Victimization Growth Model Fit Indices.*

Model	VLMR LRT <sup>a</sup>	Entropy	BIC <sup>b</sup>	AIC <sup>c</sup>	saBIC <sup>d</sup>
GMM: 1 Class	--	--	2082.432	2037.153	2050.681
GMM: 2 Classes	-1008.58	.98	1736.706	1677.843	1695.429

<sup>a</sup>Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.

\* $p < .05$ .

For this model, the mean intercept and mean slope were similar to those estimated in the unconditional linear growth model, suggesting a gradual decline in physical victimization over time, on average. There was also significant within-class variance in the intercept parameter ( $\tau = .19, p = .01$ ), suggesting individual differences in baseline levels of physical victimization. However, there was no significant variance in the slope factor ( $\tau = .22, p = .10$ ), indicating that the individual differences in changes in physical victimization over time were accounted for by the model.

**Relational victimization.** For relational victimization, the VLMR test indicated that a two-class model significantly improved fit over a one-class solution (-1161.109;  $p = .02$ ; see Table 5). Examination of the AIC, BIC, and saBIC supported this, as the values of these fit indices decreased with the addition of the second class. Fit indices were better for the three- than two-class model; nonetheless, the VLMR likelihood ratio test indicated that an additional class did not significantly improve the fit of the model (-969.366;  $p = .31$ ). Given this, the two-class model was considered optimal (see Table 5).

Table 5  
*Relational Victimization Growth Model Fit Indices*

Model	VLMR LRT <sup>a</sup>	Entropy	BIC	AIC	saBIC
GMM: 1 Class	--	--	2393.993	2344.217	2359.066
GMM: 2 Classes	-1161.109*	.99	2036.607	1968.732	1988.981
GMM: 3 Classes	-969.366	.93	1784.050	1698.075	1723.723

<sup>a</sup>Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.

\* $p < .05$ .

Within the two-class model, one class labeled the High Victimization class consisted of 3% of the sample, and was characterized by elevated levels of relational victimization that increased sharply over time (intercept = 2.83; slope = 2.95) (see Figure 3). The other class was much larger, and comprised the remaining 97% of the sample. This class, labeled the Low Victimization class, was characterized by initially low levels of relational victimization that decreased marginally over time (intercept = 1.45; slope = -.47). In this model, within-class variance was constrained across classes. Results indicated that significant within-class variance existed in the intercept ( $\tau = .30, p < .001$ ) and slope ( $\tau = .31, p = .008$ ) factors. This suggests that there was significant individual variability in adolescents' initial levels of relational victimization and in the patterns of change in their victimization experiences over time. Hypothesis 1 was thus not supported for relational victimization, as there was no evidence of a four-class model. Rather, the best-fitting model consisted of two classes that differed significantly in size, which failed to account for significant within-class variance in the initial level of victimization as well as in change in relational victimization over time.

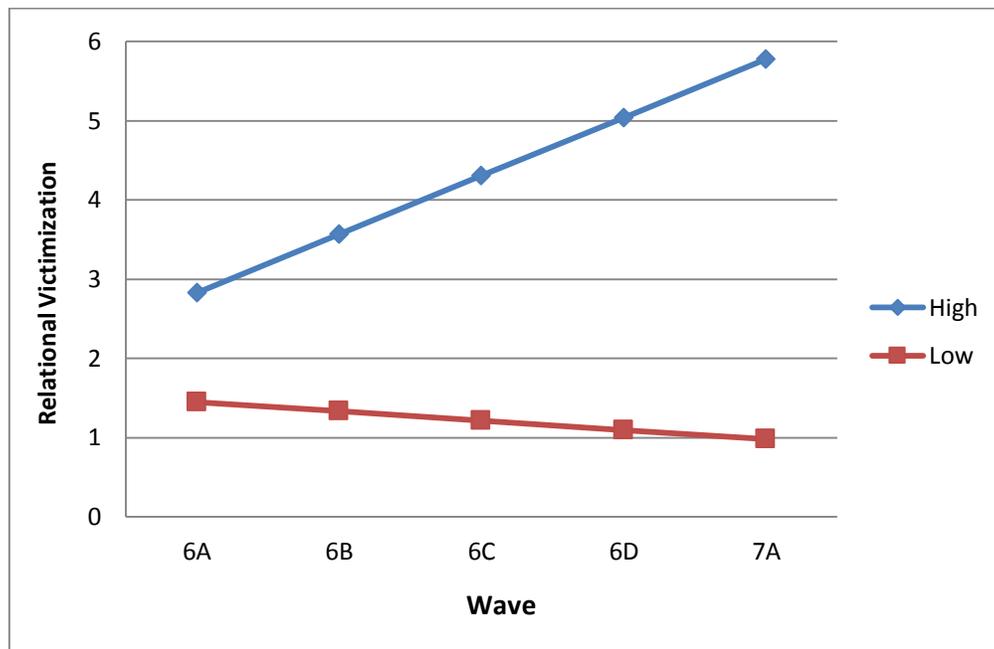


Figure 3. Two-class growth mixture model for relational victimization over five time points.

### Latent Growth Models

The original analysis plan assumed that the growth mixture analysis would identify four groups of adolescents displaying specific patterns of change over time (i.e., chronic victims, decreasing, increasing, and non-victims). What emerged instead was one large group comprised of all participants for physical victimization, and two disproportionately sized groups for relational victimization. Moreover, the classes that emerged from these analyses did not capture all of the variance in initial levels of victimization or in change in victimization over time (i.e., there was significant within-class variance in the intercept and slope coefficients). An alternative approach was therefore taken that examined relations between individual differences in growth parameters for victimization (i.e., intercept, slope, and quadratic coefficients) and changes in trauma symptoms.

Analyses of the relations between changes in each form of victimization and trauma symptoms were conducted by incorporating trauma symptoms into the unconditional growth models. Trauma symptoms in the fall of seventh grade were regressed on gender, trauma symptoms in the fall of sixth grade, and the appropriate growth parameters (see Figures 4 and 5). For these models, variance of gender was constrained to be equal to .25, as leaving this variable unconstrained resulted in a warning message from the MPlus software, which stated that the standard errors of the model parameter estimates were not trustworthy due to a non-positive definite first-order derivative product matrix. The value of .25 was chosen because the variance of gender when unconstrained was .25, with a standard error of only .001.

**Physical victimization.** Covariates were incorporated into the initial unconditional linear model described previously. Fit indices for the linear model with covariates could not be provided because the standard errors for the H1 estimated sample statistics could not be computed. H1 is an unrestricted baseline model generated in latent growth curve analyses to serve as a comparison to the specified model, but is not used in the calculation of growth factor estimates (Muthén, 2008). The error in calculated fit indices possibly occurred as a result of low covariance coverage. Figure 4 presents the tested model.

Results of the analyses indicated that the intercept factor for physical victimization did not significantly predict changes in trauma symptoms over time ( $\beta = .26, p = .08$ ). That is, initial level of victimization did not predict subsequent changes in trauma symptoms. In contrast, the slope factor was significantly related to changes in trauma symptoms, indicating that increases in the frequency of physical victimization were related to increases in trauma symptoms in seventh grade ( $\beta = .44, p < .001$ ). This provided support for Hypothesis 2, which predicted that increases

in victimization would be associated with parallel increases in trauma symptoms.

Unsurprisingly, trauma symptoms during the fall of sixth grade significantly predicted trauma symptoms in seventh grade ( $\beta = .46, p = .003$ ), reflecting stability over the year. Gender also predicted trauma symptoms in the fall of seventh grade. That is, male gender predicted decreases in trauma during the fall of seventh grade, after controlling for trauma reported during the fall of sixth grade, and the intercept and slope factors ( $\beta = -.13, p = .03$ ). Overall, 43% of the variance in trauma reported in the fall of seventh grade ( $p < .001$ ) was accounted for by this model.

Examination of correlations among variables within this model indicated that higher levels of victimization during the fall of sixth grade were related to higher levels of trauma reported at this time point ( $r = .68, p < .001$ ). In contrast, trauma symptoms during the fall of sixth grade were related to decreases in victimization over time ( $r = -.35, p = .001$ ). The intercept and slope parameters were also negatively associated ( $r = -.47, p = .002$ ), suggesting that the higher one's initial degree of victimization, the less likely this victimization was to increase over time – perhaps reflecting ceiling effects. Gender was related to trauma symptoms in the fall of sixth grade, such that males reported lower levels of distress ( $r = -.20, p = .001$ ). However, gender was not significantly related to the intercept or linear factor for victimization indicating that it was not associated with either the initial level of physical victimization or the change in physical victimization over time.

**Relational victimization.** A quadratic growth model fit the data best for relational victimization, and for that reason was used as the foundation for testing the relation between changes in relational victimization and trauma symptoms. Figure 5 represents the tested model.

The quadratic model with covariates fit the data well ( $\chi^2 (18, N = 684) = 23.86, p = .16$ , CFI=.978, TLI=.967, RMSEA=.022; see Table 3).

In this model, the intercept factor representing initial level of relational victimization did not significantly predict trauma symptoms at the beginning of seventh grade ( $\beta = .17, p = .18$ ). In contrast, the slope factor representing change in relational victimization over time was significantly related to trauma symptoms in the fall of seventh grade ( $\beta = .40, p = .003$ ). Specifically, increases in relational victimization over time were associated with increases in trauma symptoms across waves. This is consistent with Hypothesis 2, which proposed that students who experience increases in victimization will also report increases in trauma symptoms. Further, trauma symptoms during the fall of sixth grade predicted subsequent trauma symptoms ( $\beta = .56, p < .001$ ), suggesting significant stability. However, gender did not predict reports of trauma symptoms in the fall of seventh grade ( $r = -.06, p = .33$ ). This model captured 44% of the variance ( $p < .001$ ) in trauma symptoms reported in the fall of seventh grade.

For this model, initial level of relational victimization was positively related to trauma symptoms reported at the start of sixth grade ( $r = .51, p < .001$ ). In other words, higher levels of initial victimization were associated with higher levels of trauma in the fall of sixth grade. However, neither the slope nor quadratic growth factor was significantly related to trauma at this time point. Finally, the slope factor was negatively related to both the intercept ( $r = -.60, p < .001$ ) and quadratic ( $r = -.95, p < .001$ ) factors. Thus, the higher one's initial level of relational victimization, the less likely one's report of victimization was to increase over time, reflecting ceiling effects. Furthermore, youth reporting steeper initial growth curves for relational victimization were more likely to evince deceleration in growth over time. The intercept and

quadratic factors were not significantly related in this model. Gender was also unrelated to any of the growth parameters.

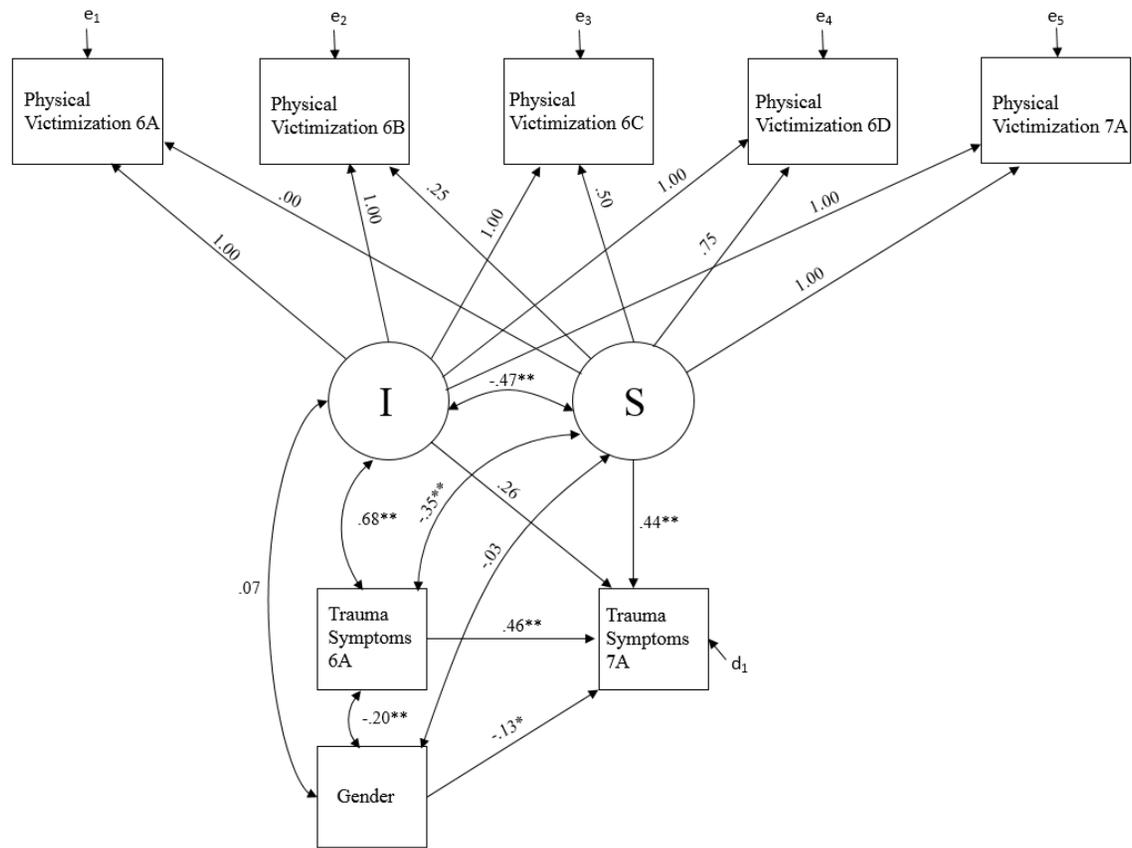


Figure 4. Latent growth curve model representing changes in reported frequency of physical victimization at each of five time points, as a function of an intercept and linear factor. This model also examined the contribution of initial levels of victimization and trajectories of victimization to trauma symptoms reported in the fall of seventh grade, controlling for gender and trauma symptoms reported in the fall of sixth grade. *Note:* Factor loadings are constrained; all other parameters are standardized.  $R^2$  for trauma symptoms in the fall of seventh grade = .43,  $p < .001$ . \* $p < .05$ , \*\*  $p < .01$

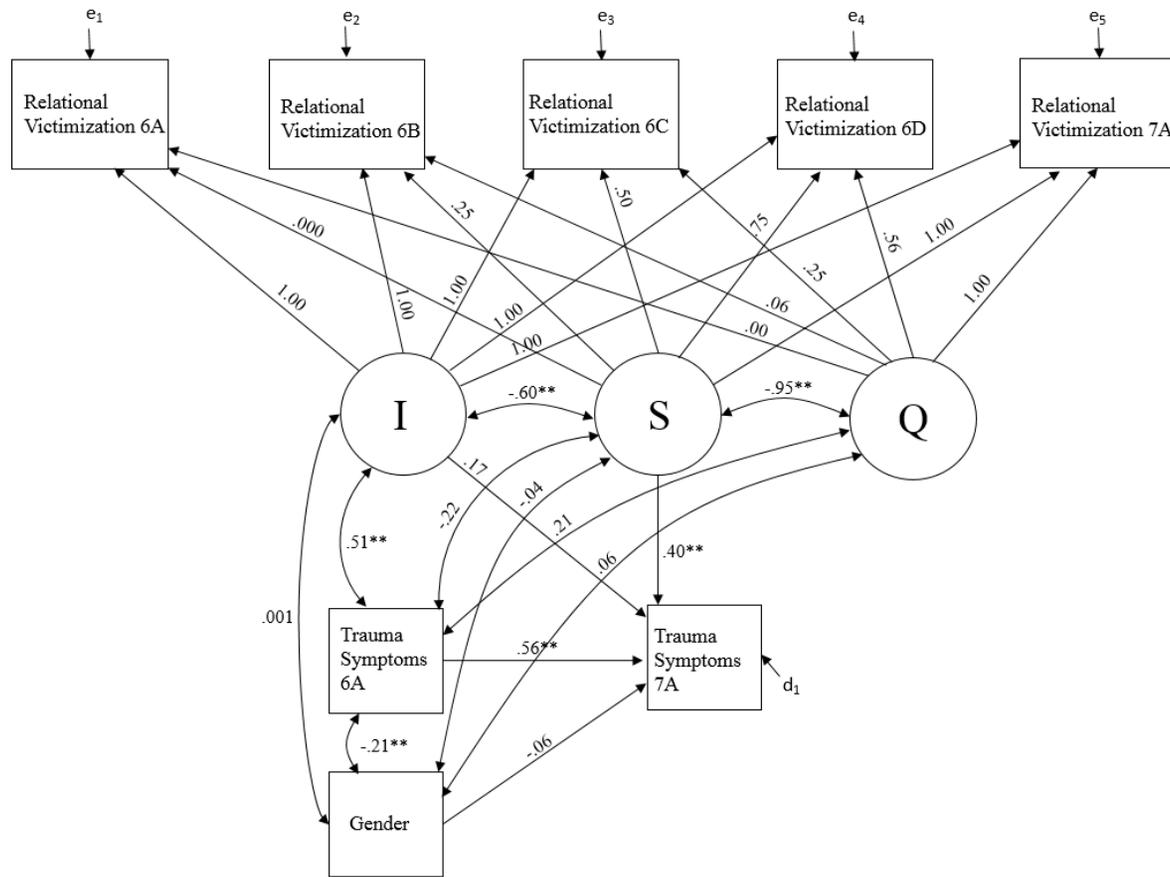


Figure 5. Latent growth curve model representing changes in reported frequency of relational victimization at each of five time points, as a function of an intercept, linear, and quadratic factor. This model also examined the contribution of initial levels of victimization and trajectories of victimization to trauma symptoms reported in the fall of seventh grade, controlling for gender and trauma symptoms reported in the fall of sixth grade. *Note:* Factor loadings are constrained; all other parameters are standardized.  $R^2$  for trauma symptoms in the fall of seventh grade = .44,  $p < .001$ .

\* $p < .05$ , \*\*  $p < .01$

## Discussion

The key purpose of this study was to examine trajectories of physical and relational victimization across time, and their relation with changes in trauma symptoms in middle school students. Hypotheses were based on prior studies that have focused on four trajectories of victimization: low, increasing, decreasing, and chronic. Further, hypotheses were derived from Kochenderfer-Ladd and Wardrop's (2001) models aimed at explaining the effect of the timing and duration of victimization on adjustment outcomes. These included the onset hypothesis, the cessation hypothesis, the life events model, and the chronic stress model.

One notable feature of this study was the fact that physical and relational victimization were examined separately. Although prior research has emphasized the need to treat these forms of victimization as unique constructs (e.g., Crick, Casas, & Ku, 1999; Storch & Masia-Warner, 2004), many previous studies have used aggregate measures that incorporated both forms of victimization (e.g., Nylund, Bellmore, Nishina, & Graham, 2007; Rueger, Malecki, & Demaray, 2011). This may obscure potentially important differences regarding trajectories of victimization due to the inclusion of multiple forms.

Results from the present study indicated that separate examination of different forms of victimization was warranted, based on differences in the unconditional growth models that best accounted for physical victimization and relational victimization. Specifically, although students' experiences of physical victimization were well represented by a linear model, their experiences of relational victimization were better represented by a quadratic model. Results from the GMM analyses used to define classes within the data also found class differences based on victimization type. That is, a one-class model best fit physical victimization, whereas a two-

class model best fit relational victimization. Together, these findings support the argument that aggregate measures of victimization may obscure unique patterns in the data, potentially leading to misleading conclusions.

Another goal of the current study was to use an empirical approach to identify classes of adolescents who had similar patterns of change in victimization over time. The majority of existing studies have used cutoffs in victimization scores to define classes (e.g., Kochenderfer-Ladd & Wardrop, 2001; Rueger, Malecki, & Demaray, 2011). In contrast, growth mixture modeling was used to determine these classes in the current study, allowing them to be defined based on empirical criteria, rather than arbitrary delineations in victimization scores. This approach made it possible to determine whether variability in adolescents' patterns of change in victimization could be captured by clustering individuals into classes. Results of the growth mixture analyses did not support the four classes that have been assumed by prior studies. This raises the issue of whether these classes truly exist in studies that have used cutoff scores in defining groups. That is, these cutoffs are determined by the authors and may not accurately reflect patterns in the data. For example, using the upper quartile in victimization scores ensures that there will be a victimized class, just as using mean-split determinations ensures the existence of a high-victimization and low-victimization class.

Prior studies that have defined groups using growth mixture modeling (e.g., Boivin et al., 2010; Goldbaum, Pepler & Connelly, 2003) have found support for at least three classes, suggesting that other factors may have accounted for the lack of more distinct classes in the present study. It may be that the time frame assessed in the current study was too brief, resulting in a limited amount of change in adolescents' experiences of victimization. Other studies that

have used growth mixture modeling to define classes have typically collected data at waves spaced a year apart, which may have resulted in greater variation in patterns of change over time. This conclusion is surprising, though, as the waves in the present study encompassed the sixth grade, a developmental period that is often characterized by more role transitions and flux than later years in middle school (Nansel et al., 2001).

There may also be technical issues that account for the differences between our study and others that have used growth mixture modeling. Critics of GMM have argued that it suffers from problems such as unfounded distributional assumptions (Bauer & Curran, 2003), assumptions about the effects of predictors on trajectory parameters as linear (Bauer, 2007), and numerous local solutions (Hipp & Bauer, 2006), which extract classes whose trajectories may differ substantially from those of the optimal solution. Bauer and Curran (2003) argued that, rather than correctly distinguishing subgroups within the data, GMM may just be extracting groups from a single, complex population distribution. For instance, bimodal data may be interpreted either as two subgroups within the data, or as a single group with non-normal distribution. Additionally, no statistical tests currently exist that can differentiate between these two explanations.

To test their hypotheses about GMM's classification accuracy, Bauer and Curran (2003) conducted a simulation study using data characterized by one homogenous class. They estimated one- and two-class solutions to determine which model better fit the data in each of three conditions, in which distribution of the data was either normal or non-normal. As hypothesized, the two-class solution better fit the non-normal data, despite the fact that these data were drawn from a single homogenous group. This suggests that researchers using GMM may erroneously

conclude that subgroups exist when, in fact, their data distribution is simply non-normal. This assumption has important implications for parameters of the model, as relations that exist in the overall population may be obscured when separately examining each of the classes. Further, the influence of predictors within these models may be more difficult to detect if subgroups are assumed where none exist. These critiques suggest that GMM is undercut by many issues, which raise doubts as to the meaningfulness of the classes that are extracted.

A final, critical focus of this study was to examine the relation between trajectories of physical and relational victimization and changes in trauma symptoms. The original plan called for testing differences across four trajectories of victimization that were expected to emerge from the growth mixture models. The failure of these specific patterns to emerge from the data meant that these models could not be tested explicitly. An alternative approach was therefore pursued to address the primary question. Specifically, this approach examined the relations between trauma symptoms and parameters within latent growth models that represented individual differences in initial level and patterns of change in physical and relational victimization.

Results of the latent growth models showed that the relation between victimization and trauma symptoms was fairly consistent across the two forms of victimization. Although neither initial level of physical nor relational victimization predicted changes in trauma symptoms, initial level of each form of victimization was concurrently related to initial level of trauma symptoms. This is consistent with findings from existing cross-sectional studies that have demonstrated significant, positive associations between different forms of victimization, including overt and relational, and trauma symptomatology (e.g., Crosby, Oehler, & Capaccioli,

2010; Storch & Esposito, 2003). These results provide support that this relation is robust across different populations, as defined by income-level and race or ethnicity.

The degree of change in victimization over time was associated with changes in trauma symptoms for both physical and relational victimization. Specifically, youth who experienced increases in peer victimization also reported increases in trauma symptoms for the period of time spanning the start of the sixth grade through the start of the seventh grade. These findings are consistent with the onset hypothesis, which predicted that increases in victimization would be related to increases in maladjustment. This study also examined gender's influence on reports of trauma, finding gender was a significant predictor of changes in trauma symptoms for physical victimization. That is, male gender predicted decreases in trauma, controlling for trauma reported during the sixth grade, and the intercept and slope latent factors associated with physical victimization. In contrast, gender did not significantly predict changes in trauma symptoms for the model that controlled for trauma reported in the fall of sixth grade, and the initial level and pattern of change in relational victimization.

By examining the relation between peer victimization and trauma symptoms, the present study contributes to the existing literature in a notable way, as this outcome has not been well-researched. Despite theoretical support and cross-sectional studies that demonstrate the potential for peer victimization to be a traumatic experience, particularly for adolescents, few studies have examined this relation longitudinally. As such, this study expands upon the scant research that has been conducted by demonstrating that changes in victimization were associated with changes in trauma symptomatology in a predominantly low-income sample of urban, minority youth.

Not only did it provide longitudinal evidence of the link between peer victimization and trauma symptoms, but it also found that this relation was consistent between types of victimization. Specifically, that increases in physical and relational victimization were each associated with increases in the trauma symptoms youth reported. This suggests that victimization, regardless of type, may potentially be a traumatic experience for adolescents and warrants intervention. Given this, it may be particularly important that intervention efforts focus on preventing escalating rates of victimization in order to curb the likelihood of youth developing trauma symptoms. Further, interventions for victimized youth may need to include psychosocial supports specifically targeted at addressing trauma symptoms such as hyperarousal, hypervigilance, and re-experiencing.

In addition to the fact that trauma is rarely examined as it relates to peer victimization, those studies that do include this as an outcome of interest have focused primarily on Caucasian samples, though exceptions do exist (see Storch & Esposito, 2003). The current study investigated trauma symptoms as a consequence of victimization and provides support that this relation holds true for a more ethnically diverse and underserved population, in line with Storch and Esposito's (2003) findings. Understanding this relation may be particularly important for this population, as low-income adolescents have been shown to be at greater risk of victimization and exposure to violence (Dake, Price, & Telljohann, 2003).

Finally, understanding how peer victimization predicts maladjustment during adolescence is critical, as this is a time period characterized by increased independence and importance of the peer group. As peer groups gain salience for emerging adolescents, peer victimization may be a

particularly detrimental experience and must be better understood in order to address the issue more effectively.

### **Limitations and Directions for Future Research**

This study had several limitations that must be recognized. First, all variables were measured via self-report. As a result, one concern is of shared method variance, in which relations between variables are inflated as a function of being assessed via the same means (Lindell & Whitney, 2001). To address this, researchers should attempt to obtain reports from multiple informants. This approach also has the potential to provide a more comprehensive understanding of victimization and its associated consequences, as different informants may contribute unique information about various facets of victimization. For example, in their study of elementary school students, Ladd and Kochenderfer-Ladd (2002) found that a multi-informant measure of victimization, comprised of self-, peer-, teacher-, and parent-report, better accounted for the variance in a composite measure of relational adjustment than did any single-informant measure.

With multi-informant reports, comparisons can be made between the experiences of youth as youth report it and their experiences as peers, teachers, and parents understand it. If significant discrepancies exist, this may be a key point for intervention efforts. For example, parents and teachers may report low levels of child victimization or distress, whereas the child and his peers may report higher levels of victimization and distress. These discrepancies may indicate that teachers and parents are not witness to many instances of victimization that students report on, and efforts should be made to increase monitoring and supervision. Further, efforts

may need to include greater psychoeducation about symptoms of distress and internalizing difficulties, so as to increase caretakers' vigilance and recognition of these negative outcomes.

Another potential limitation of the present study was that the sample was not nationally representative, presenting an obstacle to generalizability. Namely, this study focused on a predominantly African American, low-income, urban sample of youth, and results may not generalize to adolescents of other socioeconomic backgrounds, ethnicities, or locales. However, it is important to note that studying this underserved population is critical, as scant research exists regarding the victimization experiences of such youth. Further, participants were drawn from only three schools, which were characterized as high-risk, including lower resources, low socioeconomic status, and high rates of violence-related incidents. This may have attenuated relations between victimization and subsequent trauma symptoms due to the possibility of restricted range for this sample. Similarly, the limited time frame of this study (i.e., one year) may have been too narrow to provide sufficient variance in the variables of interest, which may have also diminished associations.

Although gender was included as a predictor of trauma symptoms in seventh grade in this study, separate models were not run to examine whether the relation between victimization and trauma was similar for boys and girls. As such, conclusions about the moderating effect of gender cannot be made. Additionally, traumatic events other than peer victimization were not accounted for. The results of the present study suggest that changes in physical and relational peer victimization were each associated with concurrent changes in trauma symptoms, but the study failed to control for other experiences that are likely to contribute to distress. For instance, community violence exposure, such as witnessing violence and violence victimization, have

been shown to result in post-traumatic stress disorder (Cisler, Amstadter, Begle, Resnick, & Danielson, 2011; Overstreet, 2000). Given that the participating schools were located within high-risk communities, participating youth may have had a high likelihood of being exposed to community violence. As such, inclusion of this variable in the model would have allowed for disentangling these effects, providing better support for the argument that peer victimization uniquely predicts trauma symptomatology, above and beyond that associated with exposure to community violence. The present study also failed to control for intervention condition, which may have influenced the findings. Specifically, the relation between changes in victimization and changes in trauma symptoms may have been attenuated with the inclusion of youth who received the violence prevention curriculum. These students may have been taught more adaptive responses to victimization, such as telling an adult or communicating how they feel to their peers, thereby decreasing their likelihood of concurrent increases in trauma symptomatology.

The fact that only two forms of victimization were assessed in the current study presents another limitation. Although physical and relational victimization have been widely examined, there also exists a body of research on verbal victimization. A more comprehensive understanding of victimization was therefore precluded as a result of not including verbal victimization within the present study. As such, future studies should include verbal victimization in their assessment of peer victimization to provide a more complete understanding of this experience in adolescence. Given that verbal victimization becomes increasingly common as children mature (Björkqvist, 1994), more research to determine its relation to maladjustment is warranted.

An important limitation that must be addressed is the fact that the causal direction of the relation between changes in peer victimization and changes in trauma symptoms could not be determined given that these variables assessed change over the same time frame, namely, the fall of the sixth grade through the fall of the seventh grade. This relation may be accounted for by the onset hypothesis, which proposes that increasing maladjustment follows increasing victimization. However, an alternative explanation is that increasing maladjustment, in this case, trauma symptomatology, results in increased peer victimization, as youth who have experienced significant trauma may exhibit characteristics that heighten their chances of being victimized. For instance, such youth may be more irritable, reckless, or on edge with peers, reducing their chances of developing protective friendships and potentially provoking their peers, thereby placing themselves at higher risk of victimization. This is consistent with Bronfenbrenner's social-ecological model (1979), which argues that development occurs as a result of the constant interaction between an individual and his or her environment such that each impacts the other.

Another explanation for the relation between change in victimization and change in trauma symptomatology may be an external factor that influences both of these variables. One such factor could be poor coping skills, whereby youth who lack sufficient coping resources may be at greater risk of more severe trauma symptomatology following exposure to negative life events (Schiraldi, 2000). Youth with poor coping skills, which may manifest as aggression or substance use, may also be more susceptible to peer victimization as these behaviors have been shown to be associated with victimization (Jansen, Veenstra, Ormel, Verhulst, & Reijneveld, 2011; Sullivan, Farrell, & Kliwer, 2006). Other internalizing problems may also be responsible for the relation between changes in trauma symptoms and peer victimization, as preexisting

anxiety and depression have been shown to place individuals at greater risk of developing PTSD (Breslau, Davis, Andreski, & Peterson, 1991) as well as experiencing peer victimization (Fekkes et al., 2006).

Finally, the mechanism through which the relation between victimization and trauma symptoms occurs was not examined. Past research provides a theoretical foundation for the development of trauma following victimization experiences, such as dissonance between beliefs and actual experiences (Janoff-Bulman, 1989), and a helpless outlook on the world (Abramson et al., 1978). However, the ability to test these competing theories was precluded by the fact that these potential mediators were not included in the current study.

This study extends the existing literature on the relation between peer victimization and adjustment. Specifically, results indicated that increases in both physical and relational victimization over time were associated with concurrent changes in trauma symptoms in a sample of sixth and seventh grade youth. This suggests that peer victimization can be a highly upsetting experience for youth, as it may result not just in less extreme forms of internalizing problems, but also trauma symptomatology. Furthermore, this finding has important implications for prevention efforts, as it indicates that targeting multiple forms of victimization is necessary to improve youth functioning. Research has shown that conflicts involving relational aggression receive less intervention from school officials than those involving physical aggression (Xie, Farmer, & Cairns, 2003). However, given the results of the present study, interventions may need to focus on reducing victimization that targets social relationships in addition to physically aggressive behavior.

An important aim of future research should be to understand whether the findings of this study are consistent throughout middle school. Given that middle school is not a uniform experience, the relations that emerged between victimization and trauma for sixth grade students may differ from that of their seventh and eighth grade counterparts. For instance, as youth mature and form stable peer groups, the influence of peer victimization may decrease. This may be truer of physical victimization than relational victimization given the school context and the emphasis on social relationships. Further, research should expand upon the scope of the current study by examining peer victimization of adolescents across a longer time period. Doing so may provide a more comprehensive and accurate understanding of the relation between peer victimization and youth functioning during adolescence, a developmental period characterized by increased autonomy and greater peer influence.

Another important objective of future studies should be determining whether gender differences exist in the pattern of relations between various forms of victimization and trauma symptoms, which can be achieved by conducting multiple group analyses. The literature has found gender differences in other adjustment indicators with victimization (Galen & Underwood, 1997; Paquette & Underwood, 1999), such that girls may report greater internalizing difficulties than boys following victimization. As such, this question should be explicitly tested with peer victimization and trauma. Finally, future studies should test potential mediators between peer victimization and trauma symptomatology to uncover the mechanisms through which this relationship operates.

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