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AGGRESSION AND VICTIMIZATION IN A LATE ELEMENTARY SCHOOL SAMPLE: IDENTIFICATION AND RELATION TO FRIENDSHIP

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ABSTRACT

Although research on peer aggression and victimization has greatly expanded in the last several decades, it is often limited by its tendency to only use single-informants with a-priori determined classifications, to limit findings to either aggression or victimization but not both, and to explore relations to friendship primarily among early and late adolescents but not younger children. This dissertation aimed to (1) utilize latent class analysis to aggregate self-, teacher-, and peer-reported aggression and victimization into statistically derived and validated classifications of aggressors and victims; and (2) explore friendship dynamics among both LCA and cut-score identified aggressors and victims to test existing theory regarding friendship relations and aggression and victimization with an early elementary school population and expand theory to those who are both aggressive and are victimized.

Data were from 538 youth from 28 third- and fifth-grade classrooms in a highly urban state and a more rural state, assessed at three time-points over the course of a school year: early (September/October), winter (January/February) and spring (May/June).

Latent class analyses revealed a five-class solution for aggression and victimization, with expected classes for uninvolved, aggressors, victims, and aggressive victims and an additional class for moderate aggressors. The LCA successfully aggregated the only moderately concordant data for self-ratings and peer-nominations into a valid aggregated class. The moderately aggressive class had moderate levels of all behaviors and contained more girls and more individuals from the more urban state. Reasons for this finding are explored.

Models testing friendship relations with aggression and victimization were mixed and often inconsistent with previous findings and sometimes inconsistent between LCA and cut-score identified classes. Having non-victimized friends was protective against victimization only

for cut-score identified victims during the period between the early and winter assessments. Friendship was strongly protective for aggressive victims. Having victimized friends or aggressive friends did not increase risk for becoming victimized or engaging in aggression behavior. Being victimized and being aggressive both reduced numbers of incoming friendship ties. Reasons for differences between these findings with younger youth and previous findings with older youth, differences between cut-score and LCA identified classes, and differences between earlier and later waves are all explored.

Overall, this dissertation demonstrates the need to closely consider how aggressors and victims are identified and the need to expand research to test existing theories on friendship, aggression, and victimization on younger children and on those who are both aggressive and are victimized.

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Chapter 1:

Introduction

Research exploring aggression among school-aged children has dramatically increased in the last several years, spurred, in part, by public urgency to prevent many negative outcomes associated with the behavior. Yet, this vast body of research is limited by several factors. First, it has often made several assumptions about the nature and classification of aggression and victimization that have only recently begun to be validated and tested using advances in methodology. Second, many theories have only been tested within a limited age range of participants, often focusing on youth in pre-adolescence through adolescence, limiting the generalizability of those theories to children in elementary school. Third, only a handful of studies have begun exploring the phenomena of children being both aggressors and victimized and explored not only differing effects on those children but also differences in risk and protective factors.

The goal of this dissertation is to expand the current literature on aggression and victimization to address these limitations. Specifically, this dissertation uses innovative methods to identify and validate classes of aggressors and victims and then uses these classes to understand the protection and risk afforded by friendship to becoming members of each of these classes in an elementary school population. There are two research aims. The first aim is to utilize latent class analysis (LCA) to identify groups of aggressors and victims based on self, teacher, and peer reports at three time points. These latent class statuses are tested for consistency across 3rd, and 5th grade samples, between female and male participants, and between an urban and suburban setting. After a final model is determined, classes are tested for validity based on their stability over time, their relation to cut-score identified aggressors and

victims, and their relations to other indicators of aggression. The second aim is to utilize the classifications identified by the LCA, and those identified using a more-common cut-score method with peer-nominations in a series of multi-level regression models to test a series of hypotheses regarding the relation of friendship selection and influence processes to aggression and victimization, expanding current research on these relations to a younger sample and uniquely including youth identified as both aggressor and victim.

Consequences of Aggression and Victimization

Attention to and urgency to understand peer aggression and peer victimization has grown in the last two decades, driven in large part by the many potential negative outcomes linked to the behaviors (Cook et al., 2010; Hawker & Boulton, 1999; Nansel et al. 2001, Rivers et al., 2009). Although most work on the consequences of aggression and victimization have utilize cross-sectional designs limiting directional inference (Hawker & Boulton, 2000; Nansel et al., 2001; Rigby, 2001), the available research indicates that peer aggression and victimization may be risk factors for many detrimental academic, psychological, and behavioral outcomes.

Victimized youth are more likely to have internalizing symptomatology including depression and anxiety (Cook et al., 2010; Hawker & Boulton, 2000) that may persist into adulthood (Ledley et al., 2006). Ledley and colleagues (2006) find, using retrospective data, that reports of childhood teasing by peers are significantly associated with later interpersonal functioning including increase reports of social anxiety. Similarly, victimization is linked to increased suicidal ideation (Rigby, 2001) and such ideation is shown, in retrospective analysis, to persist into adulthood (Roeger et al, 2010). Physical health is also affected by victimization. Rigby (2001) demonstrates that victimized youth report lower physical health even two years after victimization stops. Victimization also has a significant impact on school engagement and

academic achievement. Students who are chronically rejected and mistreated by peers in kindergarten through fifth grade are more likely to perform poorly in academics, avoid school, and decrease participation in the classroom setting (Buhs, Ladd, & Herald, 2006). Additionally, in one longitudinal study of students across middle school, academic achievement was significantly decreased for students experiencing victimization—the equivalent of 1.5 letter grade decline in a single academic subject (Juvonen et al., 2011).

Peer aggression is also related to many negative outcomes for those who engage in the behavior. For instance, peer aggression is strongly related to criminal perpetration in adulthood (Ttofi, Farrington, Losel, & Lober, 2011). In a metanalysis by Ttofi and colleagues, peer aggressors were 2.5 times more likely to engage in criminal behavior than non-aggressors. This relationship increased depending on at what age aggressors were identified; aggressors in later adolescence were more likely to engage in criminal offenses than aggressors in childhood. Further, Ttofi and colleagues conducted a metaregression to test the effect of including additional covariates such as other behaviors longitudinally associated with criminal offenses, and found that the relation between aggression in youth and criminal perpetration remained strong and statistically significant.

Peer aggression is also linked to both positive and negative impacts on relations with peers. On the one hand, peer aggressors have been found to both be perceived as popular or "cool" even by non-aggressors (Rodkin et al., 2006) and to be fairly well embedded in the peer networks. Faris and Felmlee (2011) find, for instance, that aggressors are neither the most peripheral nor the most central to their peer networks, but enjoy relative "popularity" (here defined as social network centrality) to those who are not aggressive. Findings by Cairns and colleagues (1988) further find that though highly aggressive youth were not the most popular

members of their social networks, they maintained strong friendship ties and were central members of their own social groups. At the same time that aggression may yield peer status and social dominance (Hawley, 2007), if not paired with high socially savvy behavior, aggression may lead to social adjustment problems in the future. Crick (1996) finds, for instance, that children identified as either overtly or relationally aggressive at the beginning of a school year, but were not additionally identified as having high prosocial behavior, were less socially adjusted by the end (here operationalized as peer rejection). Overall, aggressive youth may enjoy a sense of popularity but are generally unliked by their peers (Asher & Dodge, 1986).

There is comparatively less research exploring those who both are aggressive and are victimized, this group has been shown to have the highest risk for negative outcomes (Cook et al.,2010; Juvonen, Graham, & Schuster, 2003; Nansel et al., 2001; Schwartz et al., 2001). Juvonen, Graham & Schuster (2003) find that aggressive victims are more likely to have conduct problems, disengage in school, and have the highest levels of depression and loneliness. Similarly Swearer and colleagues (2001) find that bully-victims report much higher anxiety than victimized and uninvolved youth. Schwartz and colleagues (2001) further argue that aggressive victims are more likely to have difficulties with depression, self-esteem, somatic complaints, and academic achievement than their uninvolved, solely-victimized, and solely-aggressive peers. Emerging research also suggests that aggressive victims are at highest risk for suicidal ideation and behaviors (Limber & Kowalski *in preparation*). Still, others argue that aggressive victims look no different than sole-aggressors or sole-victims and should not be explored separately (Sekol & Farrington, 2010). According to findings by Sekol and Farrington (2010), youth between the ages of 11 and 21 in residential care who are both aggressive and are victimized do not have unique risk or protective factors than those who are sole-aggressors or sole-victims. As

such, they argue, it is a disservice to consider the group separately. Despite these findings, it is clear that more work is needed to truly understand the nature of aggressive victims and whether they have differing risk, thus requiring special attention and intervention.

Classifications of Aggression and Victimization

Although the research demonstrates that aggression and victimization may be detrimental for the youth involved, the above reviewed literature often treats the behavior as a one-dimensional construct. That is, it is assumed that when the terms "aggressors" or "bullies" or "victims" in the literature are used, there is a common meaning and a common operationalization and that they are validly identified. Yet, there is no standard way to identify those that are aggressors, victims, or otherwise involved in aggression and victimization. Studies often use differing definitions, measures, reporters (e.g. self, peer, teacher), and cutoffs in the identification of aggressors or victims (Schwartz et al., 2001). Thus, findings regarding the development and effects of aggression and victimization might in part be attributable not to the behaviors themselves but to the measurement used.

Further, studies often explore either victimization or aggression and by default do not identify those who are both aggressive and victimized. Although many etiological studies consider three classifications – aggressors, victims, and aggressive victims (those who both perpetrate and are victimized) many studies instead focus on the differences based on the form or function of the aggression used and victimization experienced (Cook et al., 2010; Underwood, 2003). These studies often focus solely on either aggression or victimization, rarely measuring both and therefore, in essence, confounding the theoretical aggressive victim group with sole aggressors or sole victims. As reviewed above, aggressive victims may be uniquely at risk for

negative outcomes, and it is thus critical to identify and research this group separately (Juvonen, Graham & Schuster, 2003; Schwartz et al., 2001).

Thus far, procedures for classifying groups of aggressors, victims, and aggressive victims tend to rely on arbitrary cut-scores, and are often criticized for lacking validity (Furlong et al., 2010). Many previous methods, particularly those reliant on self-report measures, depend not on statistically validated procedures but rather on "cut-off" points. For instance, on self-report likert items, some researchers will classify students as aggressors or victims based on their mean scores or on reaching critical thresholds on individual items (see, for instance, Limber et al., 2004). For peer report items, classifications may be based on standardized scores such that anyone scoring a certain number of standard deviations away from the mean is classified as an aggressor or a victim. These methods often yield the classifications of aggressors and victims incomparable between studies, especially when different methodologies and informants have low rates of convergence (Swearer et al., 2010). Using multiple informants is often regarded as a more valid way of assessing behaviors such as aggression and victimization, as it can reduce the tendency of any one informant to be biased, but concordance between informants is often low (Ladd & Kochenderfer-Ladd, 2002). Further, different informant tools utilize different measurement scales; whereas self or teacher reports may rely on likert type scales, often peers are not asked to rate each individual student but rather nominate those who fit a certain category, necessarily creating a different scale. Combining such informant data, thus, is not straightforward. Investigators must consider the weight to give to each informant's data. Even as data is combined, classifications need to be made between aggressors, victims, and other categories in somewhat arbitrary ways, making an a priori assumption on the number of "true classes." Utilizing a statistically-based classification method allows for the combining of

multiple data informants, potentially giving the measures more cross-informant validity, and allows for no a priori decision on number of classes to be made (Collins & Lanza, 2010; Giang & Graham, 2009).

Latent Class Analysis (LCA) utilizes multiple measures to separate individuals into latent groups or classes. The model estimates conditional probabilities of belonging to each latent class based on levels of variables in the model and thus does not rely on arbitrary cut points. However, certain variables in the model may necessarily require decisions regarding cut-points since LCA requires categorical or ordinal values, therefore using LCA does not fully eliminate this issue. Still, LCA's ability to aggregate multiple variables helps balance the arbitrary nature of these cut-point decisions. Variables included in the model must be theoretically driven, but can include both predictor and outcome variables. Additionally, the number of classes is not fixed; instead model fit (e.g. AIC, BIC) indices help drive the identification of classes (Collins & Lanza, 2010).

Previous Applications of LCA to Aggression and Victimization

Three previous studies applied LCA to aggression and victimization data. In a sample of sixth grade students, Giang and Graham (2008) utilized standardized peer nominations for physical, verbal, and relational perpetration and victimization in both cut-score classifications and in LCA. A five-class model ("socially-adjusted" (uninvolved), "victim", "aggressor", "aggressive victim" and "victimized-aggressor") was identified as best fitting the data. Although "uninvolved" or "socially-adjusted" and victim subgroup classifications were similar between tradition and LCA models, classifications for aggressors, and the typical aggressive victims differed significantly. LCA revealed that traditional conceptions of the aggressive victim neglected to recognize that there may be two distinct types – those who are highly aggressive

victims and those who are highly victimized aggressors. These two classes showed unique outcomes on psychosocial adjustment and academic achievement.

Williford and colleagues (2011) examined longitudinal classifications from fourth through sixth grades of aggression and victimization utilizing self-report data. LCA models for each grade indicated differing solutions for fourth versus fifth and sixth grade. In fourth grade, a four factor model (victim, aggressor, aggressor-victim, uninvolved) fit best whereas in fifth and sixth grades, a three factor model (victim, aggressor-victim, uninvolved) fit best. Additionally, membership within each of these classes was highly unstable over time. Williford and colleagues limited their LCA model, however to only testing up to a five-class solution. They additionally report that though the five-class model had better fit indices than the three or four-class solutions, the item probabilities did not fit with any clear theoretical pattern; they do not include, however, the item probabilities for this solution.

Unlike the other studies presented, Nylund and colleagues (2007) explored latent classes of victimization without also considering aggression. In a 3-year longitudinal sample of middle school students, Nylund and colleagues found, using a self-rating victimization scale, three distinct classes of victims– those who are highly victimized (high likelihood of endorsing all victimization items), those who are sometimes victimized (moderate likelihood), and non-victims (low probability of endorsement). This three-class model was consistent through each of their six time-points. Comparing findings to the more-common cut-score procedures, Nylund and colleagues found that the statistically driven LCA model was able to detect different trajectories for the three classes on depression, indicating that the typical cutoff approaches may lose information about relative impacts.

Although the three studies identified reveal somewhat different findings about the underlying "true" classifications of aggression and victimization, it is clear that utilizing an LCA approach has the potential to produce significantly different findings from the more often used cut-score approach. Differences in these previous studies may be attributed to the variance in measures used and age demographics of samples. It is important to note that for each of these studies, even though items distinguishing different forms of aggression/victimization were used, these did not emerge as separate classes. Each of these previous studies are still limited by their use of only single-informant measures, failing to take advantage of the potential benefit LCA provides in aggregating different forms of data in order to provide a more multi-dimensional construction of aggression and victimization.

Socioecological Context and Aggression

Understanding the contextual predictors of aggression and victimization is critical to developing effective prevention strategies (Sweaer & Espelage, 2011). An individual's behavior is not just determined by his or her own characteristics but is determined in part by the context surrounding the individual (Bronfenbrenner, 1986). It is thus critical to approach the study of peer aggression from this socioecological perspective. Swearer and Espelage (2011) adapted the socioecological framework to better describe the specific structures most relevant to the study of peer aggression. Here, all involved in aggressive behavior (aggressors, victims, aggressive victims, and bystanders) are all influenced by their familial, peer, and school relationships, community factors, and broader culture. They argue that simply engaging change at the most proximal microsystemic levels may not be sufficient to change the contextual drivers for peer

aggression. Instead, efforts need to take a systemic approach, addressing each level of the socioecological system.

Although every component of the socioecological system is important to understanding of peer aggression, for purposes of this dissertation I have chosen to focus on the peer context and specifically on the relations between friendship, aggression and victimization. The peer context is critical to both the risk for engaging in aggression and for the protection afforded to potential victims. Even though classrooms and schools are "involuntary social-groups" (Juvonen and Galvan, 2007), students select peers similar to themselves to form friendships in subgroups (cliques) and close dyads (Kandel, 1978). Two robust findings in diverse studies of peer groups are that students typically choose to form friendships and group affiliations with classmates who are similar to themselves (McPherson, Smith-Lovin & Cook, 2001), and that friends and groupmates are then able to influence each other's behaviors and attitudes. The resulting homophily—or trait similarity--of these groups thus results from a combination of *selection* and *influence*. Understanding the role of selection and influence in the development of aggressive behaviors or the protection from victimization is particularly useful for the development of more targeted and effective interventions (Valente, 2005).

Friendship and Victimization

Having friends is critical for victimized youth. Several studies focused on friendship and victimization demonstrate that victimized youth tend to have fewer close friends than non-victimized youth and report lower friendship quality with the friends they have (e.g. Bukowski & Sippola, 2001; Hodges, Malone, & Perry, 1997; Smith, Shu & Madsen, 2001). Hodges, Malone and Perry (1997) found a correlation of $r = -.47$ for victimization and number of reciprocated friendships using a cross-sectional study involving proportion of peer-nominated victimization

and three same-sex friendship nominations. Friends are able to moderate other risk factors including provocative behaviors by standing up for and defending the targeted child, preventing prolonged victimization (Hodges, Bovin, Vitaro & Bukowski,1999; Hodges, Malone, & Perry, 1997). Hodges, Bovin, Vitaro and Bukowski (1999) find the relation between internalizing behaviors and victimization is moderated by friendship such that those internalizing behaviors predict increases in victimization over time only for those who lack a reciprocated friendship.

Several theories have been proposed surrounding why victimized youth tend to have fewer friends, yet these hypotheses have rarely been considered in tandem. Some argue that friendships serve as a protective factor for children, reducing their risk of victimization (Boulton et. al, 1999). Others argue that victims may have friends at the onset of victimization, but that those friends break their friendship ties to victims as a means of self-preservation (Bukowski & Sippola, 2001). This hypothesis posits that (1) friendships with victimized youth increase risk for victimization and therefore (2) non-victimized youth sever friendships with victimized youth as a means of self-preservation. Still others argue that both peer victimization and friendlessness are related to individual internalizing and self-withdrawing behavior. This "common predictor" hypothesis suggests that lowered self-worth precedes and predicts both increased victimization and fewer friendship ties (Bukowski & Sippola, 2001; Hodges et al., 1999).

In a previous longitudinal exploration of these hypotheses using a sample of three consecutive cohorts of seventh and eighth grade students, I found that there was evidence supporting each process, concurrently, while controlling for endogenous network effects and gender homophily (Temkin & Gest, *under review*). Having non-victimized friends decreased the likelihood of victimization while having victimized friends increased the likelihood of victimization. Further, being victimized decreased the likelihood of being selected as a friend.

Finally, having low self-worth decreased the likelihood of making friendship nominations and increased the likelihood of victimization. Findings from this study additionally demonstrated that victimized youth are often friends with other victimized youth (homophily). These findings have not yet been replicated with another sample or confirmed in other developmental stages.

Friendship and Aggression

Consistently, adolescent peer groups are found to be homophilic in regards to aggression (Cairns et al., 1988; Espelage, Holt & Henkel, 2003; Pellegrini, Bartini, & Brooks, 1999). Although there is little empirical exploration regarding the relative selection and influence processes contributing to this homophily, some suggest that individuals in aggressive peer groups initially select in not because of aggression but rather for the perceived popularity members of the group enjoy (Salmivalli, 2010). Once together, the members may engage in what Dishon and colleagues (1994) term "deviancy training"; group members engage in more aggressive behavior eliciting more aggression from other members to maintain and enhance group cohesion. Espelage, Holt and Henkel (2003) indeed find that frequency of aggressive behaviors by individual members within groups identified as high in aggression in the fall increased over the course of the school year. Thus, being friends with someone who is aggressive may be a risk factor for aggression.

At the same time, aggression itself may influence the propensity for individuals to be selected as friends. Recent research by Farris and Felmlee (2011) with high school students suggests that aggression may be used to gain status among peers. Although the most aggressive youth are not the most popular students (defined as social network centrality), neither are they on the periphery of their networks. Instead, they argue, these youth may be using aggression to gain

and maintain their social standing. Cairns and colleagues (1988) on the other hand find no significant differences in aggressive youths' tendencies to become either central members of their social networks or to become socially rejected compared to non-aggressive peers.

Friendship and Aggressive Victimization

The knowledge base surrounding the aggressive victim is still emerging. Few studies have explored the development of aggressive victimization and even fewer have explored relations with friendship. Still give the dual role aggressive victims play, it is reasonable to hypothesize that many of the same underlying selection and influence factors that contribute to the friendship and behavior relation for both aggressors and victims are, too, in operation for aggressive victims. It is important, first, to understand however whether aggressive victims are more closely related to aggressive peers or victimized peers, and the progression of whether aggression or victimization leads to aggressive victimization. In one study by Hanish and Guerra (2004), aggressors and aggressive victims were found to be fluid categories and highly interrelated, with little relation between aggressive victims and non-aggressive victims. Schwartz and colleagues (2001) argue that aggressive victims often have behavioral difficulties and may be viewed as more provocative by peers, making them more likely to be viewed as aggressive and invite victimization. Aggressive victim's aggression is more likely to be disorganized and not goal-oriented, however; those who use aggression in an organized and goal-drive manner were found in one study to have low risk of rejection and victimization by peers but those who seemed random in their aggression were more likely to be victimized later on (Pope & Bierman, 1999). Other more anecdotal accounts, however, suggest that victimization can lead to aggression such as in the case of extreme retaliation (Leary et al, 2003).

There are few studies that have explored friendship patterns among aggressive victims specifically. Those studies that have considered aggressive victims as a separate group, however, show unique patterns from those who are uniquely victimized or perpetrators. Juvonen, Graham and Schuster (2003) find, for instance, that aggressive victims are the most likely to be ostracized by their peers. For those that do have friends, Mouttapa and colleagues (2004) find that aggressive victims' friends are less likely to be victimized and are only more likely to be aggressive for girl aggressive victims. In self-report studies, aggressive victims are also more likely to report being negatively influenced by peers and/or friends than victims, perpetrators or uninvolved counterparts (Cook et al., 2010; Haynie et al., 2001).

The Current Study

The current study has two aims. The first aim is to build upon the emerging literature utilizing latent class analysis to identify and validate groups of aggressors and victims. This study expands upon earlier studies by extending the application of LCA to a younger sample (3rd and 5th graders), and by utilizing information about aggression and victimization patterns from three sources: self-, teacher-, and peer-report. The second aim is to utilize the classifications determined by the LCA in addition to cut-score identified classes to test a series of hypotheses regarding the relation of friendship selection and influence processes to aggression and victimization using multi-level regression models. This aim builds upon existing research and theory by attempting to replicated findings in a younger cohort of participants and considering aggressive victims separately from aggressors and victims to understand if they have unique patterns of relations with friendship dynamics.

Aim 1

The first aim involves utilizing Latent Class Analysis to statistically identify groups of students based on their involvement in aggression and victimization. Using a mixture of self-, teacher-, and peer-reports models allowing for anywhere from two through seven classes will be tested, and a best fitting model will be determined based on commonly accepted fit statistics.

Given the dearth of literature that has explored classes of victimization and perpetration using LCA, especially with an young elementary school population, there are several possible outcomes:

H1C.1: A four-class solution consistent with previous classification techniques will emerge (aggressor, victim, aggressive victim, uninvolved). This hypothesis in essence confirms the historical classifications of perpetration and victimization and is partially consistent with findings from Giang & Graham.

H1C.2: The aggressive victim classification will split into "aggressive victims" and "victimized aggressors." This hypothesis would replicate findings from Williford and colleagues (2011).

H1C.3: The best fitting model will separate based on levels of endorsement or informant. This hypothesis would follow the findings of Nylund and colleagues (2007) who found separation based on frequency of victimization. This is also likely given the relatively small, but still significant correlation between self-rated victimization and peer and teacher nominated victimization.

After the initial classifications are identified, these classifications will be tested to see if they vary as a function of grade, gender, and urbanicity. Once a final model is established, classes will be validated based on their stability, relation to cut-score and self-rated classifications, and relation to other indicators of aggression.

Aim 2

Utilizing both the LCA classes identified in Aim 1 and peer identified cut-score classes of aggressors, victims, and aggressive victims, Aim 2 tests the following hypotheses based on existing literature reviewed above:

Victimization:

H2V.1: Friendship Protection. There is a negative linear relation between number of reciprocated non-victimized friends and likelihood of victimization. Youth with several reciprocated friendships with non-victimized classmates are less likely to be victimized by peers over time than are youth who have one or fewer such friendships (Boulton et al., 1999; Malcolm et al., 2006).

H2V.2: Self-Preservation. Youth who name victimized classmates as friends are more likely to become victimized over time; and youth will be more likely to discontinue their friendships with victimized classmates than their friendships with non-victimized classmates (Ellis & Zabartany, 2007; Pellegrini et al., 1999).

Aggression:

H2A.1: *Popularity*: Youth who are aggressors will be more likely to be selected as friends than non-aggressors. *This hypothesis is partially based on the work of Farris and Felner (2011) who found that bullying is used in part to gain social network popularity.*

H2A.2: *Influence*: Youth who are friends with aggressors are more likely to become aggressive over time (Espelage, Holt & Henkel, 2003; Dishon et al., 1994).

Aggressive Victimization:

Given the lack of direct exploration into the development of aggressive victimization nor the relation between aggressive victimization and friendship, these hypotheses are based on the initial explorations into the aggressive victim phenomena that suggests that aggressive victims are (1) more isolated from their peers; and (2) more likely to be influenced by their peers. The following hypotheses thus suggest that being an aggressive victim is likely in part based on previous status as either an aggressor or a victim and on the influence of friends' aggression and victimization.

H2.AV1: *Isolation*. Youth who both are aggressive and are victimized will be less likely to be selected as friends. This hypothesis is consistent with findings from Juvonen, Graham and Schuster (2003) & Pope & Bierman (1999).

H2.AV2: *Aggression to Victimization.* Youth who are aggressive and are more likely to become aggressive victims. This hypothesis is consistent with findings from Hanish and Guerra (2004) and Pope & Bierman (1999).

H2.AV3: *Victimization to Aggression*. Youth who are victimized are more likely to become aggressive victims. These two hypotheses, in tandem, assert that aggression and victimization may not happen simultaneously – that one behavior may necessarily precede the other.

H2.AV4: *Aggressive Influence.* Youth with friends who are aggressors are more likely to become aggressive victims. This hypothesis is based in part on findings that aggressive victims are more likely to be influenced by their peers than others (Cook et al., 2010). Victimized youth may be aggressive perhaps in the drive to maintain friendships and social status (Farris & Felner, 2011). If their friends are particularly aggressive, this influence may be even greater.

H2.AV5: *Victimization Influence.* Youth with friends who are victimized are more likely to become aggressive victims. Building upon the self-preservation hypothesis relating to victimization, youth who are victimized might engage in aggressive behaviors to gain status (Farris & Felner, 2011) but at the same time still be targeted based on their associations with other victimized youth (Bukowski & Sippola, 2001). However, findings from Mouttapa and colleagues (2004) suggest that this relation may not hold for aggressive victims.

H2.AB6: *Friendship Protection*. Youth with friends who are neither victimized nor aggressive will be less likely to become aggressive victims. This hypothesis builds upon

the existing literature base for victimized youth that suggests that having reciprocated friends is protective against victimization (Boulton et al., 1999). The same may well be true for aggressive victims.

Chapter 2:

Methods

Participants

Participants were drawn from 28 third-, and fifth-grade classrooms. Sixteen classrooms were located in a small, predominately-white, working-class district in the northeastern United States and 12 classrooms were located in two more-urban districts in the midwestern United States. Informed parental consent was sought for each student in each classroom yielding a consent rate of 87.0%. Parental consent was solicited for new students at each wave of assessment, allowing students moving into study classrooms during the assessment period to be included. Consented students were additionally asked to give assent to participate yielding an overall participation rate, for giving responses at at least one wave, of 82.6%. Students who did not receive parental consent or who did not assent were still allowed to be nominated as friends and for each of the peer nomination items as described below. The current sample thus consists of all students present in each classroom at any point during the school year (n = 538). Demographic information for the sample is reported in Table 2.1.

Table 2.1.

Sample Demographics

	Third Grade	Fifth Grade
n Classrooms	14	14
n Students	268	270
% participated	81.0%	83.3%
% male	52.8%	53.3%
% white	66.7%	69.5%
% black	21.9%	22.5%

Procedure

As part of a larger investigation of youth peer relations, school adjustment, and teacher practices participants were asked several items regarding their friendships, self-ratings, and peer nominations at three time points during the school year: September/October, January/February, and May/June. Third and fifth grade participants were asked to fill out paper based surveys. Teachers were additionally asked to complete student behavioral profiles for each consented participant. Wave one featured an abbreviated survey for both students and teachers, resulting in some items only being asked at waves two and three. To keep consistency in items informing LCA formation, only items present at all three waves were used in the LCA. Additional aggression items were used to validate the LCA findings. Means and SD for each measure are reported in Table 2.2. Correlations between each predictor for the LCA are reported in Table 2.3.

Table 2.2

Means and Standard Deviations

		Wave 1			Wave 2			Wave 3		
	Informant	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.
Aim 1										
Variables for LCA										
Verbal Victimization	Self	1 - 5	2.24	1.26	1 - 5	2.30	1.26	1 - 5	2.43	1.16
Physical Victimization	Self	1 - 5	2.02	1.20	1 - 5	1.86	1.14	1 - 5	1.85	1.11
Picked On (z-score within	Peer	-1.79 - 3.26	-0.08	0.93	-2.00 - 4.37	-0.10	0.93	-2.08 - 4.26	-0.13	0.95
Fights	Teacher	1 - 5	1.68	0.96	1 - 5	1.88	1.06	1 - 5	2.02	1.06
Fights (z-score within class)	Peer	-1.74 - 5.10	-0.22	1.06	-2.01 - 4.75	-0.13	1.09	-2.08 - 5.28	-0.09	1.09
Teases Others	Teacher	1 - 5	1.94	1.05	1 - 5	1.91	1.04	1 - 5	2.10	1.10
Says Mean Things (z-score	Peer	-1.75 - 3.74	0.00	0.97	-1.78 - 3.51	0.00	0.97	-1.49 - 3.39	0.00	0.97
Variables for Validation										
Threatens or Bullies Others	Teacher	-	-	-	1 - 5	1.52	0.91	1 - 5	1.67	1.01
Uses Physical Force When Threatned	Teacher	-	-	-	1 - 5	1.30	0.69	1 - 5	1.51	0.87
Blames Others When Fights	Teacher	-	-	-	1 - 5	1.90	1.27	1 - 5	2.04	1.30
Harms Others	Teacher	-	-	-	1 - 5	1.59	0.87	1 - 5	1.68	0.92
Pick On Others	Self	-	-	-	1 - 4	1.34	0.78	1 - 4	1.34	0.77
Do Mean Things to Others	Self	-	-	-	1 - 4	1.58	0.92	1 - 4	1.64	0.99
Tease Others (z-score within class)	Peer	-	-	-	-1.77 - 3.41	0.00	0.97	-2.48 - 3.05	0.00	0.97
Aim 2										
Friendship (indegree)	Self	0 - 14	5.72	3.17	0 - 15	6.12	3.31	0 - 18	6.38	3.61
Friendship (reciprocated	Self/Peer	0 - 13	3.76	2.73	0 - 11	4.02	2.57	0 - 13	4.18	2.80
Reciprocated Victimzed (traditional) friends	Self/Peer	0 - 3	0.16	0.46	0 - 4	0.26	0.54	-	-	-
Reciprocated Aggressive (traditional) friends	Self/Peer	0 - 7	0.74	1.18	0 - 6	0.53	1.02	-	-	-
Reciprocated Non-Victimized (traditional) friends	Self/Peer	0 - 13	3.60	2.71	0 -10	3.74	2.53	-	-	-

Table 2.3

Correlations among LCA Predictors

	Wave 1							Wave 2							Wave 3						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Verbal Victimization (self)																					
2. Physical Victimization (self)	0.51																				
3. Picked On (peer)	0.04	0.04																			
4. Fights (teacher)	0.18	0.26	0.13																		
5. Fights (peer)	0.04	0.09	0.20	0.34																	
6.Teases Others (teacher)	0.10	0.17	0.07	0.72	0.28																
7. Says Mean Things (peer)	-0.02	0.08	0.14	0.37	0.48	0.39															
8. Verbal Victimization (self)	0.39	0.33	0.07	0.18	0.11	0.09	0.13														
9. Physical Victimization (self)	0.30	0.37	0.06	0.26	0.12	0.19	0.17	0.50													
10. Picked On (peer)	0.02	0.01	0.36	0.06	0.04	0.03	-0.01	0.05	0.11												
11. Fights (teacher)	0.11	0.18	0.12	0.66	0.32	0.60	0.34	0.18	0.24	0.05											
12. Fights (peer)	0.04	0.14	0.15	0.36	0.48	0.37	0.46	0.11	0.16	0.03	0.34										
13.Teases Others (teacher)	0.08	0.16	0.08	0.53	0.26	0.68	0.31	0.08	0.13	0.05	0.71	0.33									
14. Says Mean Things (peer)	-0.02	0.10	0.10	0.37	0.38	0.39	0.49	0.14	0.15	0.02	0.38	0.50	0.35								
15. Verbal Victimization (self)	0.18	0.19	0.07	0.19	0.10	0.13	0.19	0.37	0.28	0.06	0.17	0.16	0.12	0.12							
16. Physical Victimization (self)	0.20	0.28	0.07	0.20	0.11	0.18	0.13	0.21	0.34	0.08	0.20	0.18	0.14	0.10	0.43						
17. Picked On (peer)	-0.02	-0.04	0.27	0.05	0.09	0.00	0.08	0.05	0.02	0.28	0.05	0.08	0.07	0.03	0.10	0.13					
18. Fights (teacher)	0.08	0.20	0.13	0.63	0.30	0.54	0.29	0.14	0.24	0.05	0.71	0.35	0.56	0.38	0.15	0.24	0.06				
19. Fights (peer)	0.02	0.10	0.06	0.38	0.42	0.37	0.45	0.07	0.10	-0.01	0.37	0.46	0.35	0.49	0.14	0.09	0.05	0.45			
20.Teases Others (teacher)	0.06	0.15	0.02	0.53	0.27	0.63	0.29	0.08	0.18	0.04	0.60	0.33	0.68	0.36	0.10	0.19	0.01	0.67	0.41		
21. Says Mean Things (peer)	0.06	0.11	0.05	0.33	0.35	0.37	0.39	0.02	0.06	0.00	0.35	0.41	0.37	0.49	0.10	0.08	0.05	0.36	0.52	0.43	

Aim1:

Self-rated victimization. Participants were asked to rate their experiences with two items relating to their experiences with peer victimization on a five point likert scale (never to always): (1) I have been called mean names, made fun of, or teased in a hurtful way, and; (2) I have been hit, kicked, pushed, or shoved around. Raw scores were used to compute the LCA.

Self-identified victimization. For purposes of comparing and validating LCA classifications, students were classified as "self-rated victims" if they rated themselves 3 or higher on either of the above victimization items.

Self-rated aggression. No self-rated aggression items were asked at wave 1, and as such self-rated aggression items were used only to validate LCA classifications at wave 2 and 3. Participants were given two statements about other kids and asked to identify which statement was more like them. They were then asked whether that statement was "really true for [them]" or "somewhat true for [them]" resulting in a four-point scale. Participants were presented with two items related to their aggression: (1) some kids do mean things to other kids; and (2) some kids pick on other kids.

Teacher-rated aggression. At each wave, teachers rated participants' aggression with two items on a five point likert scale (never to always): (1) fights, and; (2) teases others. At waves 2 and 3, teachers were additionally asked to rate each consented student on: (1) threatens or bullies others; (2) uses physical force when threatened; (3) blames others when fights; (4) harms others

Peer-nominated victimization. Participants were provided with a list of their classmates and asked to circle an unlimited number who best fit the following description: "These kids are always getting PICKED ON, being made fun of, called bad names, even hit or pushed." The raw number of nominations were summed then divided by the number of participants in the class.

This proportion was then standardized within each classroom. Because LCA requires categorical variables, and based on the skewed distribution of the data, this measure was then dichotomized with those with a z-score greater than 1 classified as a "1."

Peer-nominated aggression. At all waves, participants were provided with a list of their classmates and asked to circle an unlimited number who best fit the following descriptions: (1) These kids start FIGHTS. These kids push other kids around, or hit them or kick them, and; (2) These kids SAY MEAN THINGS to other kids, and they spread nasty rumors about other kids. At waves 2 and 3, participants were additionally asked to identify peers that PICK ON OTHER KIDS. The raw number of nominations were summed then divided by the number of participants in the class. This proportion was then standardized within each classroom. Because LCA requires categorical variables, and taking into consideration the clearly skewed and two-peak nature of the distribution of the data, these items were split into three categories: (1) those scoring $z < 1$ receiving a 0; (2) those scoring $z > 1$ receiving a 1; and (3) those scoring $z > 2$ receiving a 2.

Cut-score identified classifications. To compare and validate the LCA classifications, the above described peer items for aggression and victimization (those available at all three waves) were used to create classifications for each student in the dataset. Students were classified as "aggressors" if they scored a one or a two on either peer-nominated aggression item. Students were classified as "victims" if they scored a one on the peer-nominated victim item. Students were classified as "aggressor-victims" if they were identified as both a victim and an aggressor. These students were subsequently removed from the victim and aggressor classifications. Students were labeled uninvolved if they did not score above $z>1$ on any of the peer-nominated aggression or victimization items.

Aim2:

Friendship. Participants were provided with a list of their classmates and asked to circle an unlimited number of friends in their class. *Friendship Indegree* represents the number of peers who nominate a given student as a friend. *Reciprocated friends* are those where both peers identify the other as a friend. Only those that participated in the survey were able to have reciprocated friendships. Those who did not participate received a missing score for number of reciprocated friendships.

Reciprocated Victimized Friends; Reciprocated Aggressive Friends; Reciprocated Non-Victimized Friends. Identified reciprocated friends information was combined with either cut-score peer classifications (described above) or with LCA classification and summed to create a term for: (1) the number of reciprocated friends who are victimized; (2) the number of reciprocated friends who are aggressive; and (3) the number of reciprocated friends who are not victimized; (4) the number of reciprocated friends who are neither victimized nor aggressive. Aggressive victims were classified as both aggressive and victimized.

Data Analysis Plan

Aim 1:

The first research aim is to determine classifications of aggression and victimization at three time points using latent class analysis and to determine the consistency of such classifications between waves, genders, between third-, and fifth-grade students, and for urban vs. suburban settings (urbanicity is confounded with state in the present data). Data for three waves was first stacked to allow for consistent classes between waves and increase power. Data was then analyzed using PROC LCA in SAS and accounted for the non-independence of

students nested in classrooms by specifying classroom as a cluster, resulting in adjusted standard errors. PROC LCA utilizes an expectation-maximization estimation method to model maximum-likelihood estimates for all parameters specified. Because of this estimation method, PROC LCA is able to estimate models for all individuals in the data, regardless of missing data (Collins & Lanza, 2010).

The analysis utilized a model-building approach, with no prior assumptions of pattern, structure, or distribution of classes. First, a one-class, or independence model, was established. Then, classes were added until no additional improvement is observed in fit indices. Initial models were run without accounting for group variables (grade, gender, wave, state). Model fit was assessed using the array of fit indices provided by PROC LCA including G2, AIC, BIC, CAIC, and ABIC. Each fit index is based on the G2 index, with different adjustments made based on degrees of freedom, number of parameters estimated, and missing data present. The fit indices each vary on the penalty assigned to the G2, but typically show similar patterns of fit (Collins & Lanza, 2010).

Once a model emerged as best-fitting, these variables were added to the model one at a time to test for observed differences in predicted proportion (gamma) or predicted probabilities in item response (rho's). A final model was then run taking into account those grouping variables observed to impact the model. Patterns of rhos for the final model were observed to assign labels to the classes identified.

Posterior probabilities for each student from this final model were then used to assign classifications. The classification that had the highest probability of representing a given student was used. In some cases, particularly cases in which students had missing data, this was often a judgment call as probabilities would be close together. For consistency, the highest probability

was assigned even if two classifications were very close in probability. Three sources of information were then used in an attempt to validate the classifications: (1) stability of classes between waves; (2) relation of LCA classes to self-rated victimization and cut-score identified classes; and (3) correlation between LCA classes and other measures of aggression available at waves 2 and 3.

Aim 2:

The second research aim is to test a series of hypotheses related to the relation between friendship and aggression and victimization. First, to establish whether assumptions regarding differences in numbers of reciprocated friends for aggressive and victimized students are substantiated, a series of ANOVAs were run based on both cut-score and LCA identified classes of aggressive and victimized students. Then, each of the hypotheses outlined in chapter 1 were tested using a series of multi-level models (students nested in classrooms) in HLM 7. Models predicting binary classes (aggression, victimization, aggressive victimization) were conducted using a Bernouli distribution. Models predicting friendship indegree used a standard linear distribution.

Victimization Hypotheses. The Friendship Protection hypothesis (H2V.1) posits that having friends will protect against victimization. To model, a Bernouli MLM model tested whether the victimization at time 2 is related to the number of reciprocated victimized friends at time 1, while controlling for victimization status at time 1. The Self-Preservation hypothesis (H2V.2) has two components. The first asserts that victimized youth will not be selected as friends. To model, an MLM predicting the number of incoming friendship ties ("indegree") at time 2 was run based on victimization status at time 1 and controlling for indegree at time 1. The second component asserts that those who are friends with victimized youth will become

victimized. To test, a Bernouli MLM predicted victimization status at time 2 based on the number of victimized friends at time 1 and controlling for victimization status at time 1.

Aggression Hypotheses. The Popularity hypothesis (H2A.1) asserts that those who are aggressive will be more likely to be selected as friends. To model, friendship indegree at time 2 was predicted based on aggression status at time 1 and controlling for indegree at time 1. The Influence hypothesis (H2A.2) asserts that those who are friends with aggressors are more likely to become aggressors over time. To model, aggression status at time 2 was predicted based on number of aggressive friends at time 1 and controlling for aggressive status at time1.

Aggression-Victimization Hypotheses. The Isolation hypothesis (H2.AV1) posits that those who both aggressive and are victimized will be less likely to be selected as friends. To model, friendship indegree at time 2 was predicted based on victim-perpetrator status at time 1 and controlling for indegree at time 1. The Aggression to Victimization hypothesis (H2.AV2) posits that those who are at one point aggressive, will later be aggressive victims. To model, a Bernouli MLM was used to predict aggressive victim status at time 2 based on aggressive status at time 1. Similarly, the Victimization to Aggression hypothesis (H2.AV3) posits that those who are at one point victimized will later become aggressive victims. To model, aggressive victim status at time 2 was predicted based on victim status at time 1. The Aggressive Influence hypothesis (H2.AV4) posits that those with aggressive friends will be more likely to be aggressive victims. To model, aggressive victim status at time 2 was predicted based on the number of aggressive friends at time 1. Conversely, the Victimization Influence hypothesis (H2.AV5) asserts that those with victimized friends will be more likely to be aggressive victims. Aggressive victim status at time 2 was predicted with the number of victimized friends at time 1. Finally, the Friendship Protection hypothesis (H2.AV6) suggests that, like victimized youth,

youth with reciprocated non-victimized, non-aggressive friends will be less likely to become aggressive victims. To model, aggressive victim status at time 2 was predicted based on the number of non-victimized, non-aggressive friends at time 1.

Chapter 3:

Aim 1 Results

Results for the latent class analysis are broken into three sections reflecting the model-building approach to identifying and validating classes of aggressive and victimized students. First, the exploratory results of testing a stacked dataset containing all three waves of data are presented. Then, to validate the identified classes, correlations with additional aggression and victimization items and the more common cut-score classification procedures are presented.

Exploratory Results

To determine the best fitting model, latent class analyses were conducted starting with one-class, the independence model, up to seven classes. Each model was run five times with different random starting seeds to guarantee convergence. Fit statistics (G2, AIC, CAIC, BIC, & ABIC) and degrees of freedom are reported in table 3.1 and graphically represented in figure 3.2. P values are not reported due to the large number of degrees of freedom. As such, number of latent classes was determined primarily on the fit statistics and interpretability. Values with superscript *a* represent where the values for that indicator are the lowest, indicating best fit.

Fit indices for the models were mixed. G2 and AIC values continued to decrease as more latent classes were added. However, there appears to be a leveling off effect after the 5-class solution. CAIC (2492.02), BIC (2420.02), and ABIC (2137.66) all reach their lowest levels at the five-class solution. Additionally, the six- and seven-class model had low interpretability and small latent class separation. Following the guidance presented in Collins and Lanza (2010), the five-class solution thus emerged as the optimal fit.

Table 3.1

Fit Statistics for Latent Class Analysis by Number of Classes

Number of Classes	G2	AIC	CAIC	BIC	ABIC
1	3260.96	3302.96	3435.82	3414.82	3348.11
2	2161.59	2247.59	2519.63	2476.63	2340.03
3	1972.56	2102.56	2513.78	2448.78	2242.3
4	1792.84	1966.84	2517.24	2430.24	2153.86
5	1641.44	1859.44	2492.02[a]	2420.02[a]	2093.76[a]
6	1594.04	1856.04	2684.81	2553.81	2137.66
7	1546.78[a]	1852.78[a]	2820.73	2667.73	2181.68

[a] represents lowest value for fit index

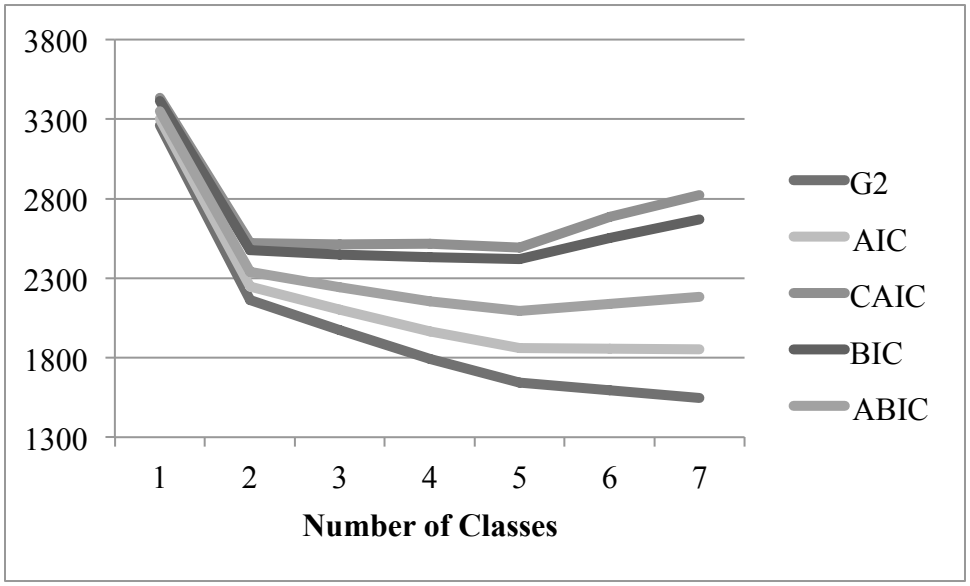

Figure 3.2. Fit statistics for latent class analysis by number of classes

After initial models were fit, gamma parameters (proportion of sample in each of the identified classes) were allowed to vary by grade, gender, state (urbanicity), and wave. The five-class solution continued to emerge as the best fitting model under these tests. Gamma and rho parameters did not significantly differ by grade, and thus grade was left out of the final model, but differences emerged for gender, state, and wave. Final gamma parameters are reported in table 3.3.

Table 3.3

Gamma Parameters for 5-class model conditioned on wave, state, and gender.

	1 = victims	2 = aggressive victims	3 = moderate aggressors	4 = aggressors	5 = uninvolved
Wave 1					
Urban State Boys	0.14	0.12	0.38	0.11	0.25
Rural State Boys	0.24	0.09	0.04	0.22	0.41
Urban State Girls	0.38	0.12	0.21	0.02	0.28
Rural State Girls	0.28	0.07	0.11	0.03	0.51
Wave 2					
Urban State Boys	0.13	0.07	0.27	0.28	0.25
Rural State Boys	0.17	0.07	0.13	0.15	0.48
Urban State Girls	0.19	0.17	0.28	0.03	0.32
Rural State Girls	0.24	0.06	0.19	0.02	0.50
Wave 3					
Urban State Boys	0.14	0.13	0.36	0.23	0.13
Rural State Boys	0.28	0.06	0.25	0.16	0.25
Urban State Girls	0.08	0.07	0.41	0.08	0.35
Rural State Girls	0.20	0.01	0.24	0.05	0.49

Interpretation of Latent Classes

For each latent class, patterns of probabilities for responses (rho's) were examined to understand the meaning of each class. Each rho represents the both the probability of a member of the identified class endorsing a specific level of each variable and the overall distribution of the variable; as most of the variables utilized for the LCA are highly skewed, rho's tended to be higher overall for all latent classes for the lowest levels of each aggression or victimization item.

However, clear patterns emerged with certain classes having higher probabilities endorsing higher levels than others. Patterns of endorsement are illustrated in table 3.4. The exact rho probabilities that informed table 3.4 are reported in Appendix A.

Table 3.4
Summary of 5-class pattern of endorsement for items based on predicted Rho probabilities

Behavior Source Item (# levels)	1 = victims	2 = aggressive victims	3 = moderate aggressors	4 = aggressors	5 = uninvolved
Aggression					
Peer Nominated					
Says Mean Things (3)	Low	Mid	Mid	**Mid -High**	Low
Fights (3)	Low	Mid	Low	**Mid-High**	Low
Teacher Rated					
Fights (5)	Low	Mid	Mid	**High**	Low
Teases (5)	Low	Mid	Mid	**High**	Low
Victimization					
Peer Nominated					
Picked On (2)	**High**	**High**	Low	Low	Low
Self Rated					
Called Mean Names (5)	**Mid-High**	**High**	Low-Mid	Low-Mid	Low
Hit, Pushed (5)	**Mid-High**	**High**	Low-Mid	Low-Mid	Low

The uninvolved class was straightforward in that they had very low probability of endorsing higher levels on any item, demonstrating that they were neither identified as aggressors nor victims.

The aggressor class had consistent patterns of being mid-to-high on all aggression items and low on victimization items. The class was more likely to be peer identified as mid- or high-level for "fights," mid- or high-level for "says mean things," self reported low to mid levels (1 to

3) of being hit or having mean names said about them, and more likely to be on the high end of the range (4 or 5) of teacher reported fighting and teasing.

The victim class was consistently low on aggression items and mid-to-high on both peer and self rated victimization. This class was highly unlikely to be identified by peers or teachers as fighting or saying mean things, but more likely to be peer identified as being picked on and self-report in the mid-to-high range of being hit and having mean things said about them.

The aggressive victim class showed patterns where members were rated in either mid or high levels for all items. This class was highly likely to self-report high levels of being hit and having mean things said about them and were likely to be identified by peers and teachers as fighting and saying mean things in the mid to high range.

The final group was likely to be identified by peers in the mid-level group for says mean things but low on fighting. The class also was more likely to be in the low to midrange for self-reported victimization (2-3) and in the mid-range (2-3) for teacher reported fighting and saying mean things. Together this class seems best described as moderate aggressors, those who are not overly identified as either aggressors or victims but likely get into a few predominately verbal conflicts. This group seems to make up a large proportion of the sample, second only to those uninvolved, making up approximately 26% of the sample.

When gamma parameters were allowed to vary by gender, state (urbanicity), and wave, as illustrated in table 3.3, girls and those from the more-urban state were more likely to be identified as moderate aggressors. Girls were also more likely to be identified as victims and boys were more likely to be identified as aggressors. Those from the rural state were more likely to be identified as victims in wave 3, and were overall more likely to be classified as "uninvolved" than those from the urban state.

Individual's classifications were then derived using the posterior predicted probabilities. Table 3.5 reports the frequency and n of each LCA classification by wave.

Table 3.5

Frequency of LCA identified aggression and victimization classifications

	Wave 1		Wave 2		Wave 3	
	N	%	n	%	n	%
Victims	125	24.80%	85	16.77%	97	19.06%
Aggressive victims	42	8.33%	36	7.10%	25	4.91%
Moderate aggressors	85	16.87%	105	20.71%	155	30.45%
Aggressors	51	10.12%	59	11.64%	66	12.97%
Uninvolved	201	29.88%	222	43.79%	166	32.61%

Stability and Validity of Classifications

To test the validity of the LCA identified groups, classifications were compared (1) within each participant over three waves (stability); (2) with same-wave cut-score and self-rated classification methods derived from subsets of the variables used in the LCA models; and (3) with additional aggression items available at waves 2 and 3.

Stability results are reported in table 3.6 and 3.7 as the proportion of each classification that was classified in each group for the later wave. Chi square tests confirmed that proportions of prior classifications were not randomly distributed into the later classifications for both the period from waves 1 to 2 ($\chi^2_{12}(16, 495) = 312.79$, $p<.001$) and for waves 2 to 3 ($\chi^2_{23}(16, 486,)=347.48$, $p<.001$). Standardized residuals (reported in full in Appendix B) revealed an overrepresentation in each cell corresponding to the same classification for both periods from wave 1 to wave 2 and from wave 2 to wave 3. That is, victims at wave 1 were significantly likely to be victims at wave 2, aggressors at wave 1 were significantly likely to be aggressors at wave 2, and so on. Aggressive victims at time 1 were also over represented as moderate aggressors at time 2, and moderate aggressors at wave 1 were over represented as aggressors in wave 2.

Table 3.6

Proportion of LCA Classifications that Remain Stable Between Waves 1 and 2

	LCA Classification Wave 2				
Wave 1 Classification	Victim	Aggressive Victim	Moderate Aggressor	Aggressor	Uninvolved
Victim	0.37^{+}	0.05	0.15	0.02^{-}	0.40
Aggressive Victim	0.10	0.34^{+}	0.34^{+}	0.17	0.05^{-}
Moderate Aggressor	0.06^{-}	0.09	0.48^{+}	0.20^{+}	0.17^{-}
Aggressor	0.04^{-}	0.14	0.12	0.51^{+}	0.20^{-}
Uninvolved	0.13	0.01^{-}	0.12^{-}	0.03^{-}	0.72^{+}

Note: Significance based on standardized residuals from Chi Square Analysis
$^{+}$ indicates significant overrepresentation in cell, $p<.05$
$^{-}$ indicates significant underrepresentation in cell, $p<.05$

Table 3.7
Proportion of LCA Classifications that Remain Stable Between Waves 2 and 3

	LCA Classification Wave 3				
Wave 2 Classification	Victim	Aggressive Victim	Moderate Aggressor	Aggressor	Uninvolved
Victim	0.39^{+}	0.01	0.21	0.04^{-}	0.35
Aggressive Victim	0.06	0.26^{+}	0.43^{+}	0.20	0.06^{-}
Moderate Aggressor	0.04^{-}	0.03	0.71^{+}	0.10	0.12^{-}
Aggressor	0.05^{-}	0.09	0.25^{-}	0.60^{+}	0.00
Uninvolved	0.25^{+}	0.01^{-}	0.15^{-}	0.04^{-}	0.55^{+}

Note: Significance based on standardized residuals from Chi Square Analysis
$^{+}$ indicates significant overrepresentation in cell, $p<.05$
$^{-}$ indicates significant underrepresentation in cell, $p<.05$

Table 3.8 illustrates the proportion of each cut-score identified category represented in each of the LCA derived categories and the proportion of self-rated victims represented in each LCA class. Significant chi-squares at all waves ($\chi^2_{w1}(12, 504)=274.56$, $p<.001$; $\chi^2_{w2}(12, 507)=402.42$, $p<.001$; $\chi^2_{w3}(12, 507)=296.98$, $p<.001$) revealed that cut-score classifications were not randomly distributed across LCA classifications. Utilizing standardized residuals (reported in full in Appendix C), proportions in each cell were compared to expected values. As the cut-score model contains only four categories and the LCA model contains five, categories are not directly comparable. Still, cells for the corresponding cut-score classifications consistently revealed significant overrepresentation. A few additional patterns emerged, as well. Considerably more victims were identified using LCA than with the cut-score model, with a significant portion of cut-score uninvolved participants identified as victims in the LCA. Uniformly, however, LCA victims were always identified as either victim or uninvolved under cut-score classification. LCA aggressors, on the other hand, were almost never identified as uninvolved or victims under cut-score classification. Both LCA identified "moderate aggressors" and "uninvolved" participants were drawn from each of the four cut-score categories, with significantly fewer identified as cut-score aggressive victims at waves 2 and 3.

Self-rated victims were also not randomly distributed across the LCA classifications at all waves ($\chi^2_{w1}(4, 504)=150.95$, $p<.001$; $\chi^2_{w2}(4, 507)=179.44$, $p<.001$; $\chi^2_{w3}(4, 507)=60.54$, $p<.001$. Consistently, self-rated victims were over represented as LCA victims, and self-rated non-victims were over represented as LCA uninvolved. At waves 1 and 2, self-rated victims were also overrepresented as LCA aggressive victims.

Table 3.8

Proportion of cut-score identified classifications identified in each LCA category

	LCA Classification				
	Victim	Aggressive Victim	Moderate Aggressor	Aggressor	Uninvolved
Wave 1	(0.25)	(0.08)	(0.17)	(0.10)	(0.40)
Peer identified (proportion of sample)					
Victim (0.07)	0.50**	0.14	0.17	0.00	0.19
Aggressive Victim (0.05)	0.00	0.27**	0.15	0.28**	0.19
Aggressor (0.15)	0.01	0.13	0.21	0.42***	0.13
Uninvolved (0.72)	0.29**	0.05	0.16	0.00	0.49***
Self Rated (proportion of sample)					
Victim (0.36)	0.45***	0.18**	0.17	0.10	0.11
Not Victim (0.64)	0.12	0.02	0.17	0.10	0.58***
Wave 2	(0.17)	(0.07)	(0.21)	(0.12)	(0.44)
Peer identified (proportion of sample)					
Victim (0.10)	0.38**	0.08	0.21	0.00	0.33
Aggressive Victim (0.03)	0.00	0.67**	0.00	0.33***	0.00
Aggressor (0.11)	0.00	0.07	0.07	0.80***	0.07
Uninvolved (0.76)	0.17	0.05	0.23***	0.02	0.52***
Self Rated (proportion of sample)					
Victim (0.38)	0.31***	0.17**	0.25*	0.16*	0.11
Not Victim (0.62)	0.07	0.03	0.18	0.09	0.66***
Wave 3	(0.19)	(0.05)	(0.30)	(0.13)	(0.33)
Peer identified (proportion of sample)					
Victim (0.07)	0.44**	0.11	0.22	0.00	0.22
Aggressive Victim (0.03)	0.00	0.29**	0.06	0.59**	0.06
Aggressor (0.20)	0.00	0.06	0.30	0.53***	0.11
Uninvolved (0.70)	0.23	0.03	0.33***	0.01	0.41***
Self Rated (proportion of sample)					
Victim (0.45)	0.33***	0.11	0.24	0.13	0.19
Not Victim (0.55)	0.14	0.00	0.28	0.13	0.45***

Note: Significance based on standardized residuals from Chi Square Frequency Analysis

*p<.05, **p<.01, ***p<.001

To demonstrate that the LCA categories are associated with other measures of aggression, classifications at waves 2 and 3 were correlated with additional self-, peer-, and

teacher-items. Table 3.9 reports the correlations between these items and LCA classifications. LCA victim classifications were significantly negatively correlated with each of the teacher- and peer-related aggression items but not significantly correlated with self-rated aggression. LCA aggression classifications were strongly correlated with teacher- and peer-rated aggression and significantly, though smaller in magnitude, correlated with self-rated aggression. LCA aggressive victim classifications were significantly correlated with teacher- and peer-rated aggression (though to a smaller magnitude than the aggressive category) but were not correlated with self-rated aggression for all but one item at one wave (wave 3 aggressive victim classification was significantly associated with self-rated "picks on others", r=0.15, p=.005).

Table 3.9

Correlations between LCA Classifications at Waves 2 and 3 with other Aggression Items

	Wave 2			Wave 3		
	Victim	Aggressor	Aggressive Victim	Victim	Aggressor	Aggressive Victim
Teacher						
Threatens/Bullies Others	-0.21***	0.45***	0.25***	-0.29***	0.52**	0.15**
Uses Physical Force When Threatened	-0.19***	0.52***	0.13**	-0.26***	0.47***	0.19***
Blames others when fights	-0.23***	0.47***	0.33***	-0.27***	0.50***	0.18***
Harms Others	-0.27***	0.40***	0.20***	-0.32***	0.41***	0.28***
Peers						
Picks on Others	-0.09	0.13**	0.05	-0.09	0.13**	0.15**
Self						
Do Mean Things	-0.07	0.20***	0.04	-0.02	0.21***	0.06
Picks On Others	-0.13**	0.41***	0.12**	-0.14**	0.49***	-0.02

Chapter 4:
Aim 2 Results

Aim 2 focused on the relation between cut-score and LCA identified aggression and victimization groups and friendship dynamics. First, generalized linear models (GLM) were conducted comparing the number of reciprocated friends between classes for both latent class identified and cut-score identified aggression and victimization categories. Models for both LCA-identified classes and for cut-score identified classes indicated significant differences between groups at all three waves (for LCA, $F_{w1}(4, 387)=8.21$, $F_{w2}(4, 406)=5.90$; LCA_{w3}: $Fw3(4, 416)= 5.28$, all $p<.001$; for cut-score classes, $F_{w1}=5.37$; 2: $F_{w2}(3, 390)=10.30$; $F_{w3}(3, 387) = 13.57$; all $p<.001$). Table 4.1 reports the means and standard deviations for reciprocated friends for each aggression and victimization class and significance based on follow-up Tukey-tests comparing each to the uninvolved class. Specific follow-up results are discussed below.

Specific hypotheses for victimization, aggression, and aggressive victimization were then tested using a series of multi-level models predicting victimization, aggression, aggression-victimization, and friendship indegree. Variance components for models predicting behavior were overall not significant, indicating most variation occurs within and not between classrooms for the intercept. Variance components for friendship indegree were significant, based primarily on the varying size of classes and peers available to contribute to indegree nominations. Results for all multi-level models are reported in Table 4.2 through 4.5 and are described based on hypothesis below.

Table 4.1

Mean number of reciprocated friends (S.D.) by LCA and cut-score identified aggression and victimization groups

	Wave 1	Wave 2	Wave 3
Latent Class Identified			
Uninvolved	4.41 (2.87)	4.54 (2.74)	4.55 (2.78)
Victims	4.09 (2.70)	4.03 (2.66)	3.92 (2.40)
Aggressive Victims	2.00[a] (1.93)	2.91[a] (1.84)	2.04[a] (1.43)
Moderate Aggressors	3.06[a] (2.48)	4.15 (2.46)	4.50 (2.90)
Aggressors	3.34 (2.42)	2.96[a] (2.01)	3.71 (3.13)
Cut-Score Identified			
Uninvolved	4.05 (2.77)	4.41 (2.57)	4.53 (2.77)
Victims	2.33[a] (2.48)	2.85[a] (2.37)	2.00[a] (1.74)
Aggressive Victims	2.42[a] (2.01)	1.45[a] (0.93)	1.31[a] (1.31)
Aggressors	3.39 (2.65)	3.25 (1.94)	4.25 (2.61)

Note. [a] represents significantly different than "uninvolved" group, $p<.05$

Victimization Hypotheses

Two hypotheses, based on prior research suggesting that victimized youth have fewer friends than non-victimized youth were tested using multi-level regression models accounting for the nested nature of the data. As reported above, to test the assumption that victimized youth have fewer friends than non-victimized youth a GLM was conducted with follow-up contrasts comparing cut-score- and LCA-identified victims to uninvolved participants in their related identification method, reported in Table 4.1. The model revealed that LCA identified victimized youth do not have significantly fewer reciprocated friends than uninvolved youth. Cut-score identified victims, in contrast, have significantly fewer friends than their uninvolved peers at all three waves.

Although the assumption of victims having fewer friends was not met for LCA-identified victims, parallel models between LCA and cut-score identified victims were conducted using

multi-level regression models to test both hypotheses. For ease of reporting and to control for effects related to other classes, final models testing both victimization hypotheses and hypotheses for both aggressors and aggressive victims are reported in Tables 4.2, 4.3, 4.4, and 4.5.

Victimization Hypothesis H2.V1: Friendship Protection. To test the friendship protection hypothesis which posits that having non-victimized friends is protective against future victimization, Bernouli distributed multi-level models were utilized to predict victimization based on the number of non-victimized friends (see Table 4.2). The cut-score identified victims showed a significant negative association between the first two waves (period 1) ($B_{12} = -0.18$, $p = .03$) and a marginally non-significant negative association between the second and third wave (period 2) ($B_{23} = -.20$, $p = .07$). Neither model for LCA identified victims yielded a significant relation.

Victimization Hypothesis H2.V2: Self Preservation. The self-preservation hypothesis has two parts: first, that those with victimized friends will become victims over time; and second, that victimized youth will be less likely to be selected as a friend over time. To test the first part of this hypothesis, a parameter for the number of victimized friends was added to the model predicting future victimization. This association was not significant for either LCA- or cut-score-identified victims, indicating that having victimized friends did not increase the likelihood of being identified as a victim (see Table 4.2). To test the second part of this hypothesis, multi-level models predicting friendship indegree from prior victimization were tested (see Table 4.3). Effects for models predicting LCA identified victims were not statistically significant, but effects for models predicting cut-score-identified victims yielded significant parameters for both periods ($B_{12} = -0.85$, $p = .02$; $B_{23} = -1.25$, $p = .003$). This indicates that having more non-victimized

friends at the prior assessment was associated with a decreased chance of victim status at the next assessment.

Aggression Hypotheses

Aggression Hypothesis H2.A1: Aggression Popularity. The aggression popularity hypothesis asserts that aggressive youth will be more likely to be selected as friends. To test, friendship indegree was predicted by previous aggression status (see Table 4.4). Models were consistent between LCA and cut-score identified youth with a significant relation found in period 1 (LCA: B_{12}=-1.13, p<.001; cut-score: B_{12}=-0.65, p=.02) but not significant for period 2 (LCA: B_{23}=-0.34, p=*ns*; cut-score: B_{23}=-0.27, p=*ns*). For both time periods and for both identification methods, parameters were negative indicating that being aggressive reduces number of incoming ties.

Aggression Hypothesis H2.A2: Aggressive Influence. The aggressive influence hypothesis asserts that having aggressive friends increases risk of becoming aggressive. To test, aggression was predicted by number of aggressive friends (see Table 4.4). All but one model showed an insignificant relation between aggressive friends and future aggression. Having aggressive friends at wave 1 increased odds of being identified as aggressive at wave 2 by 1.79 in the LCA identification model. All other models were not significant.

Aggression-Victimization Hypotheses

Both LCA and cut-score identified aggressive victims had significantly fewer reciprocated friends than uninvolved youth at all three waves, averaging between 2 to 3 fewer friends depending on identification method and wave (see Table 4.1).

Aggression-Victimization Hypothesis H2.AV1: Isolation. The isolation hypothesis, like part 2 of the self-preservation hypothesis for victimized youth, suggests that aggressive victims will be less likely to be selected as friends over time. To model, a term for aggressive victimization was added to multi-level models predicting friendship indegree (see Table 4.2). For both LCA and cut-score identified aggressive victims, relation with indegree was significant for period 1 (LCA: B_{12}=-1.07, p=.004; cut-score: B_{12}=-1.64, p<.001) but not significant for period 2 (LCA: B_{23}=-0.49, p=*ns*; cut-score: B_{23}=-0.63, p=*ns*). All parameters were negative indicating that being an aggressive victim results in fewer indegree nominations.

Aggressive victimization Hypothesis H2.AV2 & AV3: Victimization to Aggressive victimization/Aggression to Aggressive victimization. These two hypotheses test the progressive model of whether aggressive victims are likely to originate as victims or aggressors. To test, a multi-level model testing aggressive victimization based on previous aggression and previous victimization was tested in addition to controlling for previous aggressive victimization (see Table 4.5). For all models, prior victimization was not significantly related to later aggressive victimization. Prior aggression, however, was consistently related to future aggressive victimization, for both periods (LCA: B_{12}= 1.73, p=.007; B_{23}=1.36, p=.02; cut-score: B_{23}=2.54, p=.004; B_{23}=1.37, p=.02), with higher risk indicated at period 1.

Aggression-Victimization Hypothesis H2.AV4: Aggressive Influence. The aggressive influence hypotheses, proposes that those with aggressive friends will be more likely to become aggressive victims. In models controlling for prior aggressive victimization, victimization, and aggression, there was no significant association between aggressive friends and aggressive victimization (see Table 4.5). Additionally, all predicted parameters were negative indicating that having aggressive or victimized friends may decrease risk for becoming an aggressive victim.

Aggression-Victimization Hypothesis H2.AV5: Victimization Influence. Like part 1 of the self-preservation hypothesis for victimized youth, the victimization influence hypothesis asserts that those with victimized friends are more likely to become aggressive victims over time. In models controlling for prior aggressive victimization, victimization, and aggression, there was no significant association between victimized friends and aggressive victimization (see Table 4.5). Additionally, all predicted parameters were negative.

Aggression-Victimization Hypothesis H2.AV6: Friendship Protection. Like the friendship protection hypothesis for victimized youth, this hypothesis asserts that having friends that are neither victims nor aggressors will reduce risk of becoming aggressive victims. There was a significant relation between non-victimized, non-aggressive friends and aggressive victimization for both identification methods at both periods (LCA: B_{12}=-0.27, p=.03; B_{23}=-0.41, p=.004; cut-score: B_{12}=-0.39, p=.02; B_{23}=-0.44, p=.002) indicating that having such friends decreased risk for becoming an aggressive victim.

Table 4.2

Predicting Victimization from Number of Victimized and Non-Victimized Friends

	LCA Wave 1 to 2		**Cut-Score Wave 1 to 2**		**LCA Wave 2 to 3**		**Cut-Score Wave 2 to 3**	
	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)
Intercept γ00	-2.43*** (0.37)	0.09 (0.04, 0.19)	-2.67*** (0.61)	0.07 (0.02, 0.25)	-2.99*** (0.41)	0.05 (0.02, 0.12)	-2.80*** (0.54)	0.06 (0.02, 0.19)
State	0.10 (0.33)	1.11 (0.57, 2.18)	0.48 (0.59)	1.61 (0.48, 5.41)	0.31 (0.29)	1.36 (0.75, 2.50)	0.66 (0.45)	1.94 (0.77, 4.91)
Grade	0.44 (0.34)	1.55 (0.77, 3.12)	0.21 (0.60)	1.24 (0.36, 4.20)	1.22** (0.33)	2.28 (1.70, 6.70)	0.15 (0.44)	1.16 (0.47, 2.86)
Previous Victimization	1.82*** (0.29)	6.15 (3.47, 10.87)	2.59*** (0.52)	13.30 (4.83, 36.55)	1.64*** (0.31)	5.15 (2.81, 9.42)	1.80*** (0.49)	6.05 (2.29, 15.96)
# of Victimized Friends	0.09 (0.10)	1.10 (0.89, 1.34)	0.15 (0.42)	1.17 (0.52, 2.63)	-0.04 (0.14)	0.96 (0.72, 1.23)	-0.29 (0.42)	0.75 (0.33, 1.70)
# of Non-Victimized Friends	-0.06 (-0.07)	0.94 (0.81, 1.09)	-0.18* (0.09)	0.83 (0.70, 0.99)	-0.00 (0.06)	1.00 (0.88, 1.13)	-0.20 (0.11)	0.82 (0.67 1.01)
Variance Components								
υ0 (intercept)	0.17		1.12**		0.002		0.04	

Note. Results from Bernouli distributed multi-level models.
*p<.05, **p<.01, ***p<.001

Table 4.3

Predicting Friendship In-degree from Previous Aggression and Victimization

	LCA Wave 1 to 2	**Cut-Score Wave 1 to 2**	**LCA Wave 2 to 3**	**Cut-Score Wave 2 to 3**
	Coefficient (S.E.)	Coefficient (S.E.)	Coefficient (S.E.)	Coefficient (S.E.)
Intercept				
γ00	2.49*** (0.62)	2.60*** (0.60)	1.47*** (0.60)	1.61*** (0.61)
State	-0.38 (0.62)	-0.31 (0.60)	0.57 (0.55)	0.62 (0.58)
Grade	0.11 (0.62)	0.14 (0.61)	-0.24 (0.57)	-0.22 (0.59)
Previous Indegree	0.69*** (0.04)	0.68*** (0.04)	0.78*** (0.04)	0.75*** (0.04)
Previous Victimization	0.06 (0.23)	-0.85* (0.38)	-0.36 (0.29)	-1.25** (0.39)
Previous Aggression	-1.13*** (0.32)	-0.65* (0.27)	-0.34 (0.35)	-0.27 (0.35)
Previous Aggression-Victimization	-1.07** (0.36)	-1.64*** (0.44)	-0.49 (0.44)	-0.62 (0.73)
Variance Components				
υ0 (intercept)	2.43***	2.41***	2.07***	2.05***
R (level 1)	4.14	4.26	5.38	5.41

*p<.05, **p<.01, ***p<.001

Table 4.4

Predicting Aggression from Number of Aggressive Friends

	LCA Wave 1 to 2		**Cut-Score Wave 1 to 2**		**LCA Wave 2 to 3**		**Cut-Score Wave 2 to 3**	
	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)
Intercept								
γ00	-1.79***	0.17	-2.43***	0.09	-2.64***	0.07	-1.66***	0.19
	(0.33)	(0.08, 0.33)	(0.38)	(0.05, 0.20)	(0.21)	(0.03, 0.16)	(0.23)	(0.12, 0.31)
State	-0.58	0.56	-0.29	0.75	-0.08	0.93	0.11	1.11
	(0.42)	(0.24, 1.33)	(0.40)	(0.33, 1.71)	(0.29)	(0.45, 1.92)	(0.22)	(0.72, 1.74)
Grade	-1.66**	0.19	-0.64	0.53	-0.01	0.99	-0.38	0.69
	(0.49)	(0.07, 0.52)	(0.41)	(0.23, 1.21)	(0.30)	(0.46, 2.11)	(0.22)	(0.44, 1.08)
Previous Aggression	3.29***	26.85	2.56***	12.89	3.02***	20.45	2.54***	12.68
	(0.48)	(10.54, 68.38)	(0.35)	(6.47, 25.71)	(0.42)	(9.76, 42.84)	(0.31)	(6.86, 23.44)
# of Aggressive Friends	0.58*	1.79	0.17	1.18	-0.01	0.99	-0.03	0.97
	(0.29)	(1.01, 3.16)	(0.14)	(0.89, 1.56)	(0.36)	(0.57, 1.73)	(0.16)	(0.71, 1.32)
Variance Components								
υ0 (intercept)	0.24		0.52		0.0003		0.0001	

*p<.05, **p<.01, ***p<.001

Table 4.5

Predicting Aggression Victimization from Previous Aggression, Victimization and Previous Friendships

	LCA Wave 1 to 2		**Cut-Score Wave 1 to 2**		**LCA Wave 2 to 3**		**Cut-Score Wave 2 to 3**	
	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)	Coefficient (S.E.)	Odds Ratio (CI)
Intercept								
γ00	-2.29***	0.10	-4.78***	0.01	-3.23***	0.04	-3.96***	0.02
	(0.47)	(0.04, 0.27)	(0.65)	(0.00, 0.04)	(0.54)	(0.01, 0.12)	(0.60)	(0.01, 0.07)
State	0.82	2.27	0.11	1.02	-0.48	0.62	-0.16	0.85
	(0.46)	(0.87, 5.89)	(0.55)	(0.30 3.53)	(0.54)	(0.21, 1.87)	(0.57)	(0.26, 2.76)
Grade	-0.48	0.62	0.86	1.88	-1.00	0.37	-0.45	0.64
	(0.45)	(0.23, 1.58)	(0.61)	(0.49, 7.27)	(0.57)	(0.12, 1.16)	(0.59)	(0.19, 2.14)
Previous Agg Vict	1.79***	6.01	3.43***	30.88	2.81***	16.56	4.04***	56.94
	(0.45)	(2.47, 14.65)	(0.82)	(6.12, 155.63)	(0.58)	(5.26, 52.16)	(0.75)	(12.02, 249.07)
Previous Aggression	1.73**	5.64	2.54**	5.23	1.36*	3.90	1.37*	3.93
	(0.64)	(1.60, 19.89)	(0.86)	(1.45, 60.91)	(0.64)	(1.11, 13.70)	(0.69)	(1.26, 16.86)
Previous Victimization	0.85	2.34	0.17	1.18	-0.37	0.69	1.23	3.42
	(0.59)	(0.73, 7.47)	(1.00)	(0.17, 8.45)	(1.09)	(0.08, 5.91	(0.84)	(0.66, 17.79)
# of Aggressive Friends	-0.83	0.43	-0.63	0.53	-0.52	0.49	-0.44	0.65
	(0.81)	(0.09, 2.12)	(0.59)	(0.17, 1.69)	(0.49)	(0.12, 1.84)	(0.46)	(0.26, 1.58)
# of Victimized Friends	-0.31	0.74	-0.35	0.71	-0.18	0.81	-0.29	0.75
	(0.21)	(0.49, 1.11)	(0.28)	(0.48, 1.25)	(0.30)	(0.62, 1.07)	(0.69)	(0.19, 2.94)
# of Non-Vict/Agg Friends	-0.27*	0.76	-0.39*	0.68	-0.41**	0.72	-0.44**	0.64
	(0.13)	(0.59, 0.98)	(0.19)	(0.47, 0.98)	(0.15)	(0.55, 0.88)	(0.16)	(0.47, 0.87)
Variance Components								
υ0 (intercept)	0.24		0.006		0.45		0.001	

*p<.05, **p<.01, ***p<.001

Chapter 5:
Discussion

This dissertation aimed to build and expand upon existing research on aggression and victimization in several important ways. First, data from multiple informants (self, peer and teacher) were utilized in latent class analysis (LCA) to identify groups of youth with similar patterns of aggression and victimization. Prior LCA studies had utilized only single sources or did not consider both aggression and victimization. Second, classifications derived from LCA were compared systematically to classifications obtained from more commonly used cut-point classifications. Third, hypotheses derived from the existing literature on friendship relations were tested in an elementary school sample. In particular, this study tested the friendship patterns of aggressive victims, a group that has rarely been separated for purposes of understanding their relative risk and protection from friendships. Finally, the three waves of assessment within a single school year allowed for an examination of whether developmental patterns differed early and later in the school year.

Multi-Informant Classifications using Latent Class Analysis

The LCA established a five-class solution for aggression and victimization, with classes for uninvolved, victims, aggressors, aggressive victims as expected based on existing literature but also including a class that appeared to be moderately verbally aggressive and moderately victimized—"moderate aggressors". Models did not vary as a function of grade indicating that the LCA was consistent for both third and fifth graders, but models varied by wave, gender, and state and were adjusted accordingly. The classifications based on LCA were tested for validity by examining their overall stability, consistency with more commonly used cut-score

classifications, and relation to other measures of aggression that were not included in the LCA classification process.

There was moderate and statistically significant temporal stability for all LCA classes. Consistent with previous literature (Huesmann & Moise, 1998), stability across waves was high for aggressive youth (w_{12} =51%, w_{23} = 60%). The pattern for victims was also consistent with previous work suggesting that victimization does change over time (Perry et al., 2001), with a small portion classified as stable victims over time (w_{12} = 37%, w_{23} = 39%). Victimized and uninvolved youth were more likely to transition between categories, with uninvolved youth at wave 2 overrepresented as victims at wave 3. Interestingly, the moderate aggressor class seemed to be fluid between waves 1 and 2 but very stable between waves 2 and 3, with aggressive victims at wave 1 overrepresented as moderate aggressors at wave 2 and moderate aggressors at wave 1 over represented as aggressors at wave 2. Given the short interval between data collections at wave 1 and wave 2, this may be in part reflecting teachers' and peers' formation of stable judgments and abilities to judge relative involvement in aggression and victimization of different students. Further discussion of the implications of these differences will be discussed later on in this discussion.

Comparing LCA classes to classifications based on cut-scores applied to self-reported victimization and peer-reported victimization and aggression demonstrated strong associations for all related categories. The significant association between the LCA victims and both self- and peer identified victims suggests the LCA successfully combined the only moderately concordant perspectives of the different sources into a valid aggregated class.

Testing the external validity of the LCA classes by utilizing additional measures of aggression available at waves 2 and 3 revealed patterns consistent with expectations.

Correlations of all self-, peer-, and teacher-rated aggression items with LCA-identified aggressors were positive and strongly significant. In contrast, correlations between teacher- and peer- reported aggression items and LCA-identified victims were negative and statistically significant, indicating that peers and teachers do not see victimized youth as aggressors. Aggressive victims generally were significantly associated with teacher-rated aggression items but inconsistent in their relation with peer-rated aggression items. Interestingly, aggressor status was significantly positively correlated with self-rated aggression, but aggressive victim status was not significantly correlated with self-rated aggression. In other words, aggressive victims see themselves primarily as victims but others see them as highly aggressive. The implication of this finding will be discussed further below.

The "moderate aggressors" class is a departure from previous findings, but is especially intriguing given its pattern of data and demographics. Moderate aggressors are not related to any one particular cut-score class: no class was overrepresented as moderate aggressors at the following wave, although uninvolved individuals as well as aggressors at wave 2 were underrepresented as moderate aggressors. This indicates that they have a true mix of behaviors contributing to their identification, falling at moderate levels for most of the variables involved in the classification. They do not stand out as being overly aggressive or overly victimized, though they may meet the threshold to be identified as such using cut-scores. In the LCA context they are not aggressive enough to be aggressors, not victimized enough to be victims, and neither aggressive or victimized enough to be aggressive victims, but enough of each to not be "uninvolved."

When gender was added to the LCA, girls were more likely to be identified as moderate aggressors and boys were more likely to be identified as aggressors. This is consistent with a

large literature indicating that boys are more aggressive than girls (Maccoby, 2004), particularly in direct forms of aggression such as physical or verbal aggression. All aggression items utilized for the LCA touched upon either verbal or physical aggression and none touched upon more indirect forms such as relational aggression, that while utilized by both boys and girls, often make up a majority of aggressive acts committed by girls (Card et al., 2008; Salmivalli & Kaukiainen, 2004). In addition, the expectation for boys to be more aggressive than girls (Maccoby, 2004) may drive social comparisons such that girls generally are seen as less aggressive than boys. Both sets of items utilized for the LCA required some forms of social comparison: teacher items required teachers to rate aggression for all consented students in their class and peer items were normed based on the mean nominations received in the class. Thus, the pattern that moderate aggressors are likely to be rated in the mid categories for peer-rated "says mean things" and both teacher rated "teases others" and "fights," and are more likely to be girls, is not surprising.

Youth from the more urban state were generally more likely to be classified as either aggressors or moderate aggressors than youth from the more-rural state. Previous work by Nansel and colleagues (2001) on middle and high school suggests few significant differences in "bullying" behaviors between urban, suburban, and rural locales, with only a slight increase in prevalence of self-reported perpetration among rural youth. Still, youth in urban environments are more likely to witness violence in the home and in their communities and, in turn, begin to normalize the use of aggression in their peer relationships (Gorman-Smith & Tolan, 1988; Farrell & Sullivan, 2004). Classrooms and school environments in which aggression is perceived as highly normative, can result in higher frequencies of aggressive behavior (Henry et al., 2000; Thomas, Bierman, et al., 2004). Thomas, Bierman and colleagues find that young elementary

students attending school in urban environments were more than twice as likely to experience high levels of aggression in their classrooms. Thus, it is not surprising that significantly more aggressive youth were identified from the urban state than the rural state, and that this increase is seen both in the "true" aggressors class and the moderate aggressors class.

In general, the five-class LCA model based on multiple informants paints a similar picture to the traditional four-class cut-score model, yet has clear departures. The second aim of this dissertation served two purposes: to further validate and compare the meaning of the classes based on LCA and cut-scores; and to test existing theory on the relations between friendship, aggression, and victimization while expanding those theories to aggressive victimization.

Victimization

An important distinction between the LCA and cut-score classifications emerged in testing the assumption that victimized youth would have fewer friends than their uninvolved peers. This assumption held true for the cut-score identified victims but not for the LCA victims. The vast majority of studies finding fewer friends among victimized youth used peer nominations to define victims and aggressors (e.g. Boulton et al., 1999; Ellis & Zarbartany, 2007; Hodges et al., 1999), so the present findings for peer-report cut-score groups are consistent with that literature. In one study that utilized both self- and peer-reports to define victimization, a significant, negative correlation with reciprocated friendships was only found for peer-reported overt victimization (Malcolm et al., 2006). Self-reported overt victimization was not significantly related to reciprocated friendships. Relational victimization was significantly related for both peer- and self-reported victims, however the current study did not utilize measurement of

relational victimization. In sum, moving to a multi-informant framework for identifying victims diminished the association between victimization and lack of friendships.

There was some support for the hypothesis that friends protect youth from being victimized. In the cut-score models, number of non-victimized friends at wave 1 predicted less likelihood of victimization at wave 2, but the same association was only marginally signfiicant between waves 2 and 3. Given the absence of an association LCA-based victimization and number of friends, it is not surprising that the models linking victimization and friendship dynamics produced weaker results. Nonetheless, effects in LCA and cut-score victimization models were consistently in the same direction. The limited support for the friendship protection hypothesis in the current study may be due to differences in the modeling strategy and to developmental considerations. In this study, unlike prior studies, the victimization status being predicted excluded aggressive victims.

Previous studies testing the friendship protection hypothesis have focused primarily on middle school-aged youth (Boulton et al., 1999; Temkin & Gest, *under review*). In this younger sample, the nature and meaning of friendship may be different (Bukowski, Newcomb & Hartup, 1996; Crosnoe, 2000). Prior to adolescence, children are likely to equate "liking" to friendship, without the nuances associated with mutual exchanges, friendship quality, commitment, and intimacy. Children are more likely to select friends based on common interest or activities rather than those with whom they have a deep caring relationship (Hartup, 1996). Further, children spend less time interacting with peers than do adolescents (Crosnoe, 2000). As Boulton and colleagues argue, friendships may dissuade potential victimization because of the threat those friends pose to the potential aggressor – those friends may be able to both literally and figuratively defend the potential victim and may challenge the potential aggressor's social status.

If childhood friendships are based more on shared activities than on a committed and caring mutual relationship, this threat may not be as meaningful a deterrent to victimization.

Findings for the "self-preservation" hypothesis suggest that cut-score identified victims lose friends over time, but being friends with victimized youth does not increase risk for victimization. This is only partly consistent with findings with older students, but may be related to differences in children's and adolescents' tendency to form tightly-knit cliques (Crosnoe, 2000). Much of the self-preservation hypothesis hinges on a theory that victimization is, in part, used to define the boundaries of a social group and that aligning with an ostracized victim will in turn increase risk of being ostracized as well to maintain the social structure and dominance of the group (Bukowski & Sippola, 2001; Temkin & Gest, *under review*). Cliques are not as well defined in childhood and their importance to identity is less than in adolescence (Crosnoe, 2000). Thus, it appears that while younger victimized youth do lose friends, this is not related to any real risk that those friends will be victimized. Instead, other processes may contribute including the victimized individual's own social withdrawal (Rubin, Coplan, & Bowker, 2009).

Aggression

Models testing the aggression hypotheses were largely consistent between LCA and cut-score identified aggressors, yet inconsistent with predicted outcomes. The first hypothesis built upon research on older adolescents by Faris and Felmlee (2011) that showed that aggressive youth often became central to their peer networks. For both LCA and cut-score classifications, aggression was related to decreases in incoming friendship nominations between waves 1 and 2 but not between waves 2 and 3, although effects were consistently negative in all models. The latter insignificant models for friendship indegree is consistent with work by Cairns and

colleagues (1988) with 4th and 7th graders that demonstrated that aggressive youth do not, on a whole, differ from their peers in tendency to become central members of their social networks or tendency to become isolated. This is further supported by the finding that aggressive youth for both periods do not significantly differ from their uninvolved peers on number of reciprocated friends. Further exploration is needed to understand the finding at period 1. It may be that since wave 1 data collection occurred very early in the year, non-aggressive youth were more likely to dissociate with aggressive peers based on observed norms and teacher attitudes (Henry et al., 2000) and that by wave 2, associations were more solidified and stable.

There was limited support for the hypothesis that having aggressive friends increased risk of becoming aggressive over time. Only one of the four models yielded a significant effect for this hypothesis, though all effects were in the expected direction. This may be in large part due to lack of power. Density for aggression was extremely low, with many classrooms having only one or two aggressors, thus limiting the potential to have aggressive friends. Aggression was also very stable for both identification methods – those identified at wave 1 to be aggressive were highly likely to also be identified at waves 2 and 3, consistent with literature on the stability of aggression (Huessman & Mosie, 1999). Without sufficient change, there was little opportunity to relate that change to other factors.

Aggressive Victimization

Few studies have considered the transition from either aggression or victimization to aggressive victimization (see Hanish & Guerra, 2004). Models for both LCA and cut-score identified aggressive victims indicated that being an aggressor, but not a victim, at the preceding wave significantly increased risk of becoming an aggressive victim. This finding is consistent

with work by Hanish & Guerra (2004), which suggests that there is some fluidity between the aggressor and aggressive victim categories over time but little overlap with non-aggressive victims. This is inconsistent with a more general assumption, however, that is pervasive throughout the anti-bullying discourse: that victims retaliate aggressively as a result of being victimized (see, for instance the framing used by Marini, Dane, & Volk, n.d.). This is further underscored by the observation that many of the school shooters in the 1990s were reportedly victimized by their peers, drawing a natural progression from victimization to aggression (Leary et al., 2003), and by findings by Dijkstra and colleagues (2012) who find that peer victimization is a key risk factor for weapon carrying. In Dijkstra and colleagues' study, however, only those who were both victimized and were aggressive had high likelihood of carrying weapons, suggesting, perhaps that it is not pure victimization that leads to extreme forms of aggression, but rather being victimized exacerbates an already aggressive tendency.

Reflecting on the distinctions observed in the LCA classification of aggressive victims, the progression from aggression to aggressive victimization and not from victimization to aggressive victimization is particularly interesting. The fact that aggressive victims are more likely to perceive themselves as victimized than as aggressive, but more likely to be perceived by peers and teachers as aggressive with lesser recognition of their victimization is telling of aggressive victims' internalization of their behavior. It may be that aggressive victims do not recognize their behavior as aggressive, but as they are rejected by peers and reprimanded by teachers for their behavior, they may perceive such actions as victimization. Perhaps, then, the significant negative outcomes observed for aggressive victims may not derive primarily from their victimization experiences but rather a deficit in social and self-awareness (Zeman, Shipman, & Suveg, 2002). Additional research is needed to explore this theory, but it has clear

implications towards prevention and intervention strategies with aggressive victims. If skills deficits are a mediating factor between aggressive victimization and negative outcomes such as depression, suicidality, drug use, or truancy then simply addressing the aggression and victimization themselves will do little to affect these long term effects. Approaches such as social emotional learning (SEL) programs, which promote skills with which children can integrate social knowledge, emotional awareness, and behaviors to achieve goals, may have more impact generally on mitigating these outcomes (Zins et al., 2004).

The literature for friendship related to victimization and aggression is much more established than the literature for friendship patterns of aggressive victims. Still, the theories surrounding how victimization and aggression are influenced by and act as a selection tool for friendship may be relevant for those who display both behaviors. Many of the key hypotheses tested for victims and aggressors were repeated for identified aggressive victims. Aggressive victims, regardless of identification method, had consistently fewer friends than their uninvolved peers. Additionally, models were consistent for both identification methods.

The three components of the two victimization hypotheses were tested also for aggressive victims, resulting in different findings. Unlike victimized youth, there was strong support for both cut-score and LCA identified aggressive victims for the friendship protection hypothesis, with each non-victimized, non-aggressive friend reducing odds of becoming an aggressive victim by between .64 and .76 depending on identification method and period. This finding clarifies the overall weak support for the friendship protection hypothesis in this sample's victimized youth. In nearly all previous studies testing this hypothesis, aggression was not considered so that aggressive victims were not separated from non-aggressive victims. These consistently significant findings for aggressive victims suggest that perhaps when aggression is also

considered, friendship is only significantly related to aggressive victimization. Further research could separate this hypothesis from the others presented earlier in this discussion, by separating aggressive victims from non-aggressive victims in an older sample with sufficient power.

Findings were mixed for whether aggressive victimization results in fewer friendship nominations. Both models for LCA and cut-score identified aggressive victims were significant at period 1 but not significant at period 2. This may in part be because of lack of power – the raw number of aggressive victims for both identification periods goes down between period 1 and period 2. Still, parameters are in the expected direction indicating that aggressive victimized youth receive fewer incoming friendship nominations, as expected.

Neither influence of aggressive friends nor influence of victimized friends resulted in significantly increased odds of becoming an aggressive victim. Interestingly, however, although not significant, parameters for both aggressive friends and victimized friends were consistently negative for all models, suggesting that perhaps for aggressive victims, merely having friends, regardless of their involvement with aggression or victimization might be protective rather than contribute to own involvement in behavior. The lack of significance may in large part be due to a lack of power – only 5% to 8% of the sample was identified as aggressive victims using the LCA analysis. Further research is necessary to further tease apart this relation.

Considerations for Identifying Aggressors and Victims

The variations in findings observed for the LCA identified classes compared to the cut-score identified classes, particularly for victimized youth, raise a more substantial question regarding whose perspective counts when identifying youth as victims or aggressors. This question has implications both for research and for policy and practice. Methods that utilize

multiple reporting sources are generally valued for being less biased and as a result, a more valid assessment of the variable assessed (Ladd & Kochenderfer-Ladd, 2002). At the same time, peer victimization is often a subjective experience, which may not be readily observable to peers and teachers (Solberg & Olweus, 2003). Still, as Cornell and Bandyopadhyay (2010) argue, self-report is prone to both exaggeration and minimization of experiences.

Several recent streams of research have begun to argue that adults are often unaware of the peer victimization that is taking place. In one study, Bradshaw and colleagues (2007) argue that school staff consistently underestimate the rates of bullying taking place at their school by comparing self-reported victimization by students to percentage perceptions by school staff. This assessment, by definition, relies on the student self-report of victimization and aggression to be valid and the teacher report to be misinformed. Again, because the experience of being victimized may be subjective, it may be that teachers are only aware of the most observable cases or the ones they are informed of by the students themselves. On the 2009 School Crime Supplement, respondents reported that slightly less than one-third of reported peer victimization was reported to adults (U.S. Department of Education, 2011). Relying on peer consensus about a classmate's victimization (for instance by using z-score methodology to select out those who are recognized by enough peers to be significantly above the mean) also relies on those peers being aware of the victimization (Ladd & Kochenderfer-Ladd, 2002). In small classrooms, such as the ones in this study, where peers are in close propinquity throughout the day, this may not be a concern, but as Ladd and Kochenderfer-Ladd (2002) point out, the validity of reports is often dependent on the relationship each peer has with the target peer.

Requiring consensus on a victim's experience may be a slippery slope if the same standards are applied to practice. For example, the recent events in the Anoka-Hennepin school

district in Minnesota highlight the possible consequences of requiring agreement around peer victimization. In this case, several students who identified as or were perceived to be lesbian, gay, bisexual, or transgendered (LGBT) reported being pervasively bullied and several youth suicides from that district were blamed, at least in part, on the peer victimization those students faced (U.S. Department of Justice, 2012). The school district conducted an investigation where it determined that there were inconsistent reports of the victimization experienced by the students – primarily those who had taken their lives – and therefore denied that any bullying or harassment had taken place. Despite reports from parents and other students about the ongoing climate of harassment in the school district, the choice to require a high level of consensus to substantiate claims of peer victimization led the school district to do little to resolve reported cases or prevent new ones from occurring. In a March, 2012 settlement with the Department of Justice and the Department of Education which found an ongoing severe and pervasive hostile climate towards gender non-conforming youth, the school district agreed to set up clearer reporting and investigation procedures, but as is the case with many other school districts and states with reporting systems, the question remains as to how much evidence is enough to substantiate the claim of victimization; is a student's report of victimization enough to trigger services and other protections provided for in policy and law?

Peer victimization is not unique in its tendency for self-reported rates to be discrepant from other forms of reports, such as police statistics (Wittebrood & Junger, 2002). In such cases, police reports depend on the incident being reported to police and meeting a set of predetermined criteria involving often complicated legal distinctions. In self-report, depending on the nature of the criminal victimization being reported, victims may be more likely to report incidents that do not meet the legal standards of police reports or may be less likely (such as in the case of

domestic abuse or assault) to view the victimization as crimes. Both cases are relevant for the peer victimization discussion.

Youth who view themselves as being victimized, although they may not be seen by peers and teachers as being victimized, may still be at risk for many of the primarily internalizing outcomes. In fact most studies establishing the link between peer victimization experiences and such negative outcomes have been based on self-report data (see Hawker & Boulton, 2000). Yet, self-report or peer victimization is often held to the same standards of evidence as other "crimes," perhaps because the growing tendency for response to peer victimization is discipline, and disciplining students without corroborating evidence can leave schools liable if challenged. It may thus make sense for those implementing prevention and intervention practices to use differing standards of reporting and evidence to provide services to the self-identified victim and to identify and intervene with aggressors.

Yet the question remains, if research is meant to inform such prevention and intervention work, who is the right informant to obtain valid identification to determine risk and protective factors, and develop programming? Clearly, as the results of this dissertation suggest, relying on identification that takes into account self-ratings in addition to peer nominations yields many more identified victims, whose relations, at least to friendship, differ than those identified solely on the basis of peer-nominations. There is no clear answer, and further work needs to be done to understand the implications of relying on one or multiple sources for determining aggressor and victimization status.

Differences in Early and Later Year Findings

As noted previously, several findings differed between period 1 (waves 1 to 2) and period 2 (waves 2 to 3) suggesting that friendship relations with aggression and victimization may vary throughout the course of the school year. The current study was designed specifically to provide initial sociometric and peer network data at the onset of the school year (within approximately 6 weeks of the start of the school year) in order to help identify peer processes before networks and peer reputations entered a state of stability. Thus, the differences found in this current investigation are important to specifically explore as they may suggest specific time-points in a year where prevention and intervention efforts may be more or less effective.

The overall patterns of findings suggest that friendship relations to victimization and aggression are more pronounced during the early period 1 than the later period 2. Specifically, friendship indegree is only related to aggression and aggression victimization in period 1 and friendship protection only emerges as significant for cut-score victims in period 1. In addition, there appeared to be more fluidity between aggressive victim, moderate aggressor, and aggressor classes at period 1 than at period 2. Taken together, these findings may represent a greater fluidity in peer friendships and reputations during the early part of the school year but greater stability, and thus lesser relation to aggression and victimization, later on.

Many previous studies that have employed a two-assessment (Fall and Spring) design have found high stability in friendships between assessments (see, for instance, Bowker; 2004; Degirmencioglu et al., 1998), but few have explored friendships as early as the current study or using a three-wave design. Further, many studies have demonstrated that peer reputation is a highly stable construct (e.g. Bukowski & Newcomb, 1984) but again rarely measured early on in the school year. The present findings suggest that both status or reputation and friendship may

not be fully formed in the earliest stages of the school year, but may be much more stable later on. As youth work to form their social networks and reputations, their associations with others and their behaviors may be judged differently than when those social structures are more established. Particularly vulnerable youth, then, might benefit from having targeted interventions in the earliest parts of the school year to help them establish friendships and reduce negative peer reputations, but the same interventions may have little effect later in the school year. This thus requires an expansion on common assessment procedures to identify risk as soon as possible within the school year.

Developmental Differences for Elementary School Students

The results from this study diverge from previous findings, particularly as they relate to friends' influence on victimization and aggression. Previous work with middle school students suggests that having friends who are either victimized or aggressive increases the risk of also becoming victimized or aggressive, respectively (Espelage, Holt, & Henkel, 2003; Temkin & Gest, *under review*). Yet, current findings suggest that this pattern of influence is not consistent with elementary aged youth. Several factors, both contextual and intrapersonal may explain this pattern. First, elementary schools are designed such that youth are only exposed to a limited number of peers in a given day. For the most part, elementary aged youth remain in contained classroom units interacting with, at least in the present study, no more than 28 peers. Given the low prevalence of both victimization and aggression, this limited peer group thereby restricts the number of potential friends for uninvolved youth who are aggressive or victimized. Beyond the lack of potential influencers, differences may emerge because elementary aged children are less peer and status driven than adolescents and more influenced by their parental and familial

contexts (Berndt, 1979). In fact, some previous research exploring early- and late-starters (or, life-course persistent and adolescent limited) in delinquent or anti-social behavior has found that peer influence on delinquent behaviors in early-starters is insignificant when familial factors are included (Tremblay, Masse, Vitaro, & Dobkin, 1995). Moffit (1993) further argues that those who are "adolescent limited," that is, delinquency and anti-social behavior does not emerge until adolescent, are likely influenced by those who engaged in anti-social behavior early. Thus, aggressors and victims in elementary school may later pose a risk to others when they reach adolescence, but may not pose as much risk to their peers at younger ages and, in tandem, are likely not influenced in their behavior by their peers.

This is not to say, however, that this influence is necessarily consistent across all grades in elementary school. Even though contextual shifts across elementary school are minimal, limited to intensification of academic curriculum and increased group work, children's social awareness and orientation towards peers continues to develop (Berndt, 1979). Thus, one would expect that influence processes in fifth grade would be more apparent than those in third grade or lower. Unfortunately, given limited power in the current study such grade differences could not be validly tested. Still, this is an important consideration in further exploring the differences in friendship influence for elementary and middle school aged youth.

Additional Implications for Prevention and Future Research

There are several additional implications that emerge from this dissertation for prevention efforts and for future research. First, although some researchers have debated the importance of separating the aggressive victim group from sole-victims and sole-aggressors (Sekol & Farrington, 2010), the convergence of the LCA model to include this group and the consistent

differential findings for aggressive victims' relations to friendship highlight a need to both research aggressive victims separately and also potentially use different prevention and intervention techniques. Schwartz and colleagues (2001) argue that the aggressive victim group may be at most risk because they are lacking in social kills and self-regulation, where as victims and aggressors have differing needs. Findings from this study further underscore that the peer context may also be significantly different for aggressive victims, at least in this elementary school sample.

Results from this dissertation also suggest that friendship processes for aggression and victimization are different for this younger elementary sample than what has been previously found (Temkin & Gest, under review). Specifically, the influence of having victimized or aggressive friends does not seem to overly impact individuals' own aggression or victimization. At the same time, at least with peer identified victims, friendship did seem to play a small role in protecting from future victimization. Although these findings need to be replicated utilizing a larger sample in which youth have more opportunity to have aggressive and victimized friends, this finding suggests that certain peer oriented prevention strategies may be more appropriate for younger students. Such strategies, sometimes referred to as "befriending" programs, team a victimized student with a peer to serve as a resource and a friend (Naylor & Cowie, 1999). In tests with older students, these befriending programs show little efficacy (Naylor & Cowie, 1999), but given that younger children differ in their definitions of friendship and are more likely to attribute friendship to propinquity rather than the underlying relationship (Cosnoe, 2010), perhaps these strategies may have better effects.

The emergence of the fifth moderate aggressor class may also be useful in informing prevention and intervention efforts. Further work is needed to understand the nature of this class

and what risks they may have, but the initial findings of this dissertation suggest that they may be an indication of a larger need to challenge norms and climates supporting the use of aggression generally. Theoretically, this group, which is generally randomly distributed among the other groups or more likely to be uninvolved in other classification systems, represents the general tendency of their peers to use moderate levels of aggression. In this case then, perhaps when a large body of students is identified as moderate aggressors a more universal program building interpersonal skills to negate the need for aggression may be effective at reducing aggression not only for the moderate aggressors, but also for the group as a whole.

Limitations and Future Directions

Overall this dissertation has worked to replicate and greatly expand understanding about the identification of aggressors and victims and their relation to friendship, but there are many limitations to these findings. First, although sample size was modest, because aggression and victimization overall are low in frequency, power was low to detect statistically significant findings. Relatedly, because of the sparseness of data and lack of density of behaviors within each of the 28 classrooms, it was impossible to utilize more advanced techniques of separating selection and influence effects of friendship and behavior while controlling for underlying social network tendencies. In the future, it will be important to consider that the peer context is complex and multidimensional; friendships are not selected on any single variable and may additionally be influenced by external network forces. These structural network forces, or forces beyond the individual, are numerous and can involve several different combinations of patterns that drive friendship choices above and beyond the characteristics of individual members of the network (Burk, Steglich & Snijders, 2007). Any model involving friendship tie formation and

dissolution must thus take into account the non-independent nature of those choices. The regression based models utilized for this dissertation assume independence of actors and as such cannot represent the evolving contexts of friendship formation in a network setting. Future work to reaffirm that findings are related to victimization or aggression and not these underlying network forces will require the use The Simulation Investigation for Empirical Network Analysis (SIENA) modeling package (Snijders et al., 2009) to allow for simultaneous modeling of longitudinal network changes with changes in behavioral dependent variables, and to control for the endogenous network effects.

The inability to use SIENA for this dissertation, however, does not negate the present findings. Rather, the current findings are critical first steps and help to challenge assumptions about the relations between friendship, victimization and aggression especially among an elementary sample. It further establishes the need to not rely on data and models for older youth for younger children and to not assume the same protective and risk factors at play, and the need for early assessments in a school year as protective and risk mechanisms may change over the course of a school year. The findings of this dissertation call for clear considerations regarding distinct prevention and intervention approaches for younger children, procedures for identifying aggressors and victims using multiple informants, and assessments that capture early friendship and reputation formation.

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Appendix A.

Final Rho Probabilities for 5-Class LCA Solution

		Response Category	1 = victims	2 = aggressive victims	3 = moderate aggressors	4 = aggressors	5 = uninvolved
Peer Nominated	Says Mean Things	1	0.99	0.68	0.82	0.37	0.94
		2	0.01	0.27	0.18	0.35	0.04
		3	0.00	0.05	0.00	0.27	0.02
	Fights	1	1.00	0.74	0.96	0.20	0.98
		2	0.00	0.17	0.04	0.37	0.01
		3	0.00	0.09	0.00	0.43	0.01
	Picked On	1	0.85	0.71	0.91	0.93	0.93
		2	0.15	0.29	0.09	0.07	0.07
Self Rated	Called Mean Names	1	0.09	0.00	0.38	0.34	0.56
		2	0.09	0.00	0.18	0.21	0.23
		3	0.44	0.27	0.40	0.33	0.19
		4	0.13	0.07	0.04	0.12	0.00
		5	0.24	0.65	0.00	0.00	0.02
	Hit	1	0.09	0.11	0.55	0.42	0.90
		2	0.02	0.00	0.23	0.21	0.08
		3	0.42	0.29	0.20	0.29	0.01
		4	0.37	0.24	0.00	0.02	0.00
		5	0.11	0.36	0.02	0.05	0.00
Teacher Rated	Fights	1	0.77	0.05	0.08	0.10	0.90
		2	0.23	0.19	0.39	0.18	0.10
		3	0.00	0.53	0.47	0.33	0.00
		4	0.00	0.19	0.06	0.31	0.00
		5	0.00	0.03	0.00	0.07	0.00
	Teases Others	1	0.73	0.10	0.03	0.06	0.79
		2	0.21	0.10	0.31	0.22	0.16
		3	0.06	0.63	0.59	0.35	0.04
		4	0.00	0.15	0.07	0.23	0.01
		5	0.00	0.02	0.01	0.13	0.00

Appendix B.

Standardized Residuals for LCA Classification Stability

Prior Wave LCA Classification	Later Wave LCA Classification	Standardized Residuals Wave 1 to 2	Wave 2 to 3
Victim	Victim	7.17	5.37
Victim	Aggressive Victim	-1.09	-1.42
Victim	Moderate Aggressor	-1.63	-1.71
Victim	Aggressor	-3.69	-2.53
Victim	Uninvolved	-1.08	-0.41
Aggressive Victim	Victim	-1.22	-1.97
Aggressive Victim	Aggressive Victim	7.06	6.74
Aggressive Victim	Moderate Aggressor	2.24	1.95
Aggressive Victim	Aggressor	1.11	1.52
Aggressive Victim	Uninvolved	-5.27	-4.04
Moderate Aggressor	Victim	-2.75	-4.06
Moderate Aggressor	Aggressive Victim	0.60	-0.57
Moderate Aggressor	Moderate Aggressor	6.70	10.39
Moderate Aggressor	Aggressor	2.46	-0.63
Moderate Aggressor	Uninvolved	-5.30	-5.91
Aggressor	Victim	-2.56	-4.21
Aggressor	Aggressive Victim	1.96	0.87
Aggressor	Moderate Aggressor	-1.65	-3.28
Aggressor	Aggressor	9.21	8.47
Aggressor	Uninvolved	-3.71	a
Uninvolved	Victim	-1.96	3.28
Uninvolved	Aggressive Victim	-4.67	-2.58
Uninvolved	Moderate Aggressor	-3.85	-5.89
Uninvolved	Aggressor	-4.94	-4.61
Uninvolved	Uninvolved	10.22	7.51

Appendix C.

Standardized Residuals for comparisons between cut-score and LCA classifications

		Standardized Residuals		
Cut-Score Classification	LCA Identification	Wave 1	Wave 2	Wave 3
Victim	Victim	2.90	2.85	2.29
Victim	Aggressive Victim	1.04	0.40	1.67
Victim	Moderate Aggressor	-0.28	-0.37	-1.33
Victim	Aggressor	a	a	a
Victim	Uninvolved	-3.03	-2.23	-1.61
Aggressive Victim	Victim			
Aggressive Victim	Aggressive Victim	2.70	2.40	4.15
Aggressive Victim	Moderate Aggressor	-0.86	a	-2.72
Aggressive Victim	Aggressor	3.62	-2.40	4.67
Aggressive Victim	Uninvolved	-3.51	a	-2.92
Aggressive Victim	Victim	-5.38	a	a
Aggressor	Aggressive Victim	1.70	-0.26	-0.05
Aggressor	Moderate Aggressor	1.12	-3.53	-1.63
Aggressor	Aggressor	12.80	15.93	11.21
Aggressor	Uninvolved	-5.06	-7.76	-6.89
Uninvolved	Victim	2.78	-2.85	-2.29
Uninvolved	Aggressive Victim	-3.41	-1.49	-2.58
Uninvolved	Moderate Aggressor	-0.25	3.08	3.27
Uninvolved	Aggressor	-13.36	-12.74	-12.77
Uninvolved	Uninvolved	7.57	7.66	8.12

a. Because these cells lacked a critical number of units, standardized residuals were not calculated

VITA
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EDUCATION

2012 Ph.D., Human Development and Family Studies, The Pennsylvania State University
2010 M.S., Human Development and Family Studies, The Pennsylvania State University
2009 M.A., Education Theory and Policy, The Pennsylvania State University
2007 A.B., Psychology and Education Policy (Independent), Vassar College

FELLOWSHIPS AND AWARDS

The Pennsylvania State University, University Park, PA

2009 – 2010 Institutional Pre-Doctoral Fellowship
Prevention and Methodology Training Program
Funded by NIH-NIDA, T32-DA-017629

2009 Golden Key International Honor Society

2007 Hintz Graduate Fellowship

2007 Graham Graduate Fellowship

Vassar College, Poughkeepsie, NY

2007 Departmental Honors (Independent Program)

2006 Ford Scholar Undergraduate Research Fellowship

PUBLICATIONS

Temkin, D. (2008). Addressing social aggression in state anti-bullying policies. *Penn GSE Perspectives in Urban Education,*5(2).

Temkin, D.A. & Gest, S.D. (*revisions invited*). Friendship dynamics and victimization: Testing three hypotheses using actor-oriented networking models. *Journal of Research on Adolescence*

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