The Pennsylvania State University

The Graduate School

PREDICTORS OF BEING A VICTIM OR PERPETRATOR OF AGGRESSION IN THE PRIMARY GRADES:

INSIGHTS FROM THE ECLS-K 2010-11

A Dissertation in

School Psychology

by

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Submitted in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

August 2019

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ABSTRACT

The purpose of the study was to examine student (e.g., sex, race), behavioral (e.g., externalizing, internalizing) and contextual (e.g., student-teacher relationships) predictors of being a victim and perpetrator of aggression in the primary grades. Data were drawn from the ECLS-K Class of 2010-2011, and logistic regression was used to identify salient predictors of perpetration and victimization in third grade. Externalizing behavior emerged as a significant predictor of both perpetration and victimization within most primary grades. Internalizing behaviors, self-control, interpersonal skills, and teacher-student conflict were statistically significant predictors of perpetration across multiple grades, while parental use of physical discipline, internalizing behavior, and school climate were statistically significant predictors of victimization across grades. However, the odds ratio for many of these variables indicated that they did not substantively contribute to the prediction of perpetration or victimization. The results of this study indicate that prediction of involvement in aggression may need to be assessed close to when bullying behaviors are most likely to emerge in the primary grades. Further, behavioral variables tended to be the most practically significant predictors of being a victim or perpetrator, which indicates that schools may want to assess these variables as potential risk factors.

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ACKNOWLEDGEMENTS

I would like to thank Dr. DiPerna, my advisor, for his knowledge and encouragement throughout the dissertation process. I also would like to thank my outside committee members Dr. Lei and Dr. Gest for being a part of my committee and for their expertise and advice throughout the process. Additionally, I would like to thank Dr. Woika for not only being a member on my dissertation committee, but for giving me the knowledge and experiences I needed to practice as a school psychologist. Without your support and guidance throughout my graduate school career, I would not be the person and practitioner I am today.

In addition to faculty members at Penn State, I would like to thank my parents and brother for their support throughout the process. I would also like to thank Dan Harrison, my fiancé, and Linda Lim, my cohort member and best friend, for being my primary support system and pushing me to always keep going. I could not have gotten this far without you.

Chapter 1: Introduction and Literature Review

During the last 50 years researchers have attempted to identify the correlates and predictors of aggressive behavior in young children (e.g., Farrington, 1991; Lessne & Yanez, 2016; Wang, Iannotti, & Nansel, 2009). Much of this literature has focused on perpetrators of aggressive behavior. More recently, however, growing concern regarding the prevalence and impact of bullying, which reflects repeated aggressive behavior over time, has raised awareness regarding the impact of sustained aggression on victims as well as the existence of a subgroup of children who both engage in and are victimized by, aggressive behavior. As such, the purpose of the current project was to use a nationally-representative sample to identify student and contextual predictors of aggression perpetration and victimization in an elementary school population.

Relationship Between Aggression and Bullying

Although bullying and victimization have received much attention among researchers and educators during the past decade, research regarding aggression in childhood has been studied extensively for over 40 years (e.g., Farrington, 1978; Loeber, 1982; Olweus, 1979). Within this literature, aggression frequently has been associated with conduct disorder or "antisocial" behavior (Pepler & Rubin, 1991). Aggressive behavior can involve different types of acts, including physical aggression, breaking serious rules, property theft, and deceitfulness (Nagin & Tremblay, 2001). While conduct disorder can incorporate any of these behaviors, children with this disorder commonly engage in acts of physical aggression (Nagin &Tremblay, 2001). Additionally, these behaviors tend to be stable over time (Olweus, 1979).

Studies examining aggressive behavior in children have tended to focus on children who perpetrated aggression against others (e.g., Farrington, 1978; Loeber, 1982; Olweus, 1979).

Additionally, many studies have primarily focused on boys, as they tend to be more likely to perpetrate violence (e.g., Nagin & Tremblay, 2001). More recently, however, there has been an increased focus on both perpetrators and victims of aggressive behavior as a result of growing concern over the prevalence of bullying behavior in schools (e.g., recent CITE 1, recent CITE 2).

Based on Daniel Olweus's widely cited definition of bullying (1993), such behavior demonstrates three characteristics. First, the behavior must be perceived to be negative and involve some form of aggression. Second, there must be an imbalance of power between the perpetrator and victim. Third, the behavior has to occur repeatedly between both parties involved in the act. Researchers also have distinguished between two types of bullying behaviors: direct and indirect (Espelage & Swearer, 2010; Olweus, 1993). Direct bullying involves more outwardly aggressive behaviors like pushing or verbal threats and is generally regarded as the more traditional form of bullying. Indirect bullying, on the other hand, involves behaviors like spreading rumors or ignoring someone. Indirect bullying also has been characterized as relational or social aggression (Archer & Coyne, 2005). Olweus (1993) also distinguished between the two parties involved in the bullying act: perpetrators and victims. Bully perpetrators are individuals who enact a form of bullying on another person, while bully victims are the targets of the aggressive act.

Currently, many studies that purportedly examine "bullying" technically do not meet Olweus's definition because they ignore the imbalance in power and/or recurrent behavioral pattern. Similarly, the dataset used for the current study, the ECLS-K 2010-11, did not include questions related to these characteristics of bullying. As such, the current study and subsequent literature review focus on perpetrators and victims of aggression rather than bullying per se. Throughout the remainder of this dissertation, children who act aggressively towards other

students will be referred to as perpetrators, while children who others act aggressively toward will be referred to as victims.

Prevalence of Victimization and Perpetration

In 2011, the National Center for Educational Statistics assessed the prevalence of school crime in a nationally representative sample. Included in the School Crime Supplement (SCS) of the National Crime Victimization Survey, Devoe and Bauer (2011) assessed the prevalence of victimization in students who were ages 12 -18 during the 2010-2011 school year. A total of 27.8% of students reported being victims. The students also reported being called names (17.6%) or threatened in some way (18.3%). Students also reported high levels of rumors being spread about them (17.6%). The SCS was updated during the 2014-2015 school year to provide additional prevalence estimates of victimization (Lessne & Yanez, 2016). A total of 20.8% of students reported being the victim. The highest reported percentages were again being called names (13.3%) or insulted and having rumors being spread about them (12.2%).

A recent estimate of victimization and perpetration prevalence in Grades 9-12 was reported by the Centers for Disease Control and Prevention (2017). Overall, 19% of students indicated that they were the victims at school, and this percentage was relatively consistent from 2009 through 2017. A total of 14.9% of students were reported to be a victim of cyberbullying in 2017. Consistent with previous studies of victimization and perpetration (e.g., Wang, Iannotti, & Nansel, 2009), students in middle school were more likely to be victims than students in high school. Students in sixth grade were the most likely to report being victimized (37%). As students in this sample progressed through middle school to high school, the likelihood of being a victim decreased. The lowest levels of being bullied were in twelfth grade (22%).

In addition to victimization, researchers have collected prevalence estimates on perpetrators in Grades 6-10. Wang, Iannotti, and Nansel (2009) assessed the prevalence of four types of aggressive behaviors (physical, verbal, relational, cyber) in a large sample (n =7,184) of students. A total of 13.3% of students were perpetrators of physical, 37.4% of verbal, 27.2% of relational, and 8.3% of cyber bullying. Males were more likely to be the perpetrators in all areas, with the exception of relational aggression. Consistent with the prevalence estimates of victimization, perpetration tends to peak in middle school and decrease in high school (Wang, Iannotti, & Nansel, 2009).

While some research has indicated a majority of victimization and perpetration occurs in middle school, a nationally representative study conducted by the Hazelden Foundation found the highest levels of victimization and perpetration in third and fourth grade (Limber, Olweus, & Luxenberg, 2013). Specifically, 22% of students in third and fourth grade reported they had been victimized in the past 2-3 months. In fifth grade, that number dropped to 19% and slowly decreased as students progressed through middle school and high school. In contrast, perpetration was the lowest in third and fourth grade, and it increased slightly as students got older. A total of 5% of students in third and fourth grade reported being perpetrators (Limber, Olweus, & Luxenberg, 2013). In a follow-up study, Luxenberg, Limber, and Olweus (2015) found similar results with 19-22% of students reporting being victimized during third and fourth grade. They also reported that perpetration stayed fairly consistent across Grades 3-12 with 4-6% of students reporting that they were perpetrators (Luxenberg, Limber, & Olweus, 2015).

Negative Consequences of Victimization and Perpetration

With the high levels of aggression occurring in schools, it is important to consider its impact on students. Students who are victims or perpetrators tend to have worse outcomes in a number

of areas compared to their non-bullied peers (Olweus, 1978). Researchers have identified several outcomes that are commonly affected when students experience aggression. These include psychosocial variables and academic achievement.

Psychosocial. Hawker and Boulton (2000) conducted a meta-analysis that focused specifically on victimization and perpetration and psychosocial adjustment for students in elementary through high school. They concluded that victims tend to have more negative thoughts and affect than their non-bullied peers. In addition, all variables included in their study (depression, loneliness, low self-esteem, low self-concept, social anxiety, generalized anxiety, and overall anxiety) were significantly related to victimization (Hawker & Boulton, 2000), with depression demonstrating the strongest relationship. (Hawker & Boulton, 2000).

Other researchers also have found that victimization is related most strongly to symptoms of depression and anxiety in students. Adolescent victims demonstrate increased levels of internalizing disorders such as anxiety and depression and are more likely to have lower self-esteem (Brunstein, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Kowalski & Limber, 2013). As a result, adolescent victims are more likely to have suicidal ideation or to attempt suicide (Brunstein et al., 2007; Turner, Finkelhor, Shattuck, & Hamby, 2012). Furthermore, victims in Grades 6-10 tend to have less friends and perceive themselves as not fitting in with their peers (Nansel et al, 2001).

While victims are much more likely to suffer from internalizing problems, they also exhibit more externalizing behaviors than peers. Reijntjes et al. (2011) conducted a meta-analysis to examine the link between externalizing problems and victimization in early or middle childhood. Reijntjes et al. (2011) found that victims tend to have higher levels of externalizing behaviors prior to victimization, often causing them to be targeted by their peers. In addition, victims are

more likely to act in an aggressive way than their non-bullied peers. While some researchers have suggested that victims who show aggression to peers represent a small minority of victims, the study conducted by Reijntjes et al. (2011) shows that victims can also experience higher levels of externalizing behaviors before and after being victimized.

Perpetrators are more likely to have internalizing and externalizing behaviors than their non-bullied peers, but they tend to have less significant mental health problems in adolescence than victims (Olweus, 1978). Perpetrators in middle school also tend to have more friends and are less likely to be socially isolated (Nansel et al., 2001). However, perpetrators show significantly more externalizing behaviors like hitting or shoving. In addition, perpetrators are more likely to abuse alcohol or engage in delinquent behavior when they are in their adolescence (Nansel et al., 2001; Olweus, 1978). Increased internalizing and externalizing behaviors are also found for elementary students previously involved in aggression (Hawker & Boulton, 2000; Reijntjes et al., 2011). Elementary school students tend to have more negative thoughts and higher levels of aggression. However, much of the focus has been on adolescent students especially in regard to externalizing variables (e.g., Nansel et al., 2001; Olweus, 1978).

While the negative consequences of victimization and perpetration have been documented throughout middle and high school, researchers have found that the negative effects of victimization and perpetration last through adulthood. McDougall and Vaillancourt (2015) reported that men who were victimized during elementary school are more likely to use tobacco, while women have significantly higher levels of somatization. Additionally, both men and women who were victimized have more difficulty with social relationships and have worse outcomes regarding education and finances (McDougall & Vaillancourt, 2015). With regard to mental health outcomes, victims are more likely to exhibit internalizing and externalizing

behaviors, including anxiety, withdrawal, aggression, and suicidal ideation as they age (McDougall & Vaillancourt, 2015).

Academic Achievement. In addition to psychosocial variables, a number of studies have focused on the negative effects of both victimization and perpetration on academic achievement (DeVoe & Kaffenberger, 2005; Popp, Peguero, Day, & Kahle, 2014; Rothon, Head, Klineberg, & Stansfeld, 2011). Victims (12- 18-years-old) demonstrate lower levels of academic achievement in reading and math (DeVoe & Kaffenberger, 2005), and adolescents are more likely to be achieving below grade level when compared to their non-bullied peers (Rothon, Head, Klineberg, & Stansfeld, 2011). Victims are more likely to have lower academic self-efficacy (Popp, Peguero, Day, & Kahle, 2014).

Kowalski and Limber (2013) suggested that victims in Grades 6-12 may have lower levels of academic achievement because they are more likely to be absent from school or leave school early. As a result, victimized students are more likely to miss instruction or fail to turn in assignments, leading to a drop in grades. In addition, DeVoe and Kaffenberger (2005) also noted victims have a harder time concentrating than their non-bullied peers and suggested that a possible explanation for the increased truancy and lack of concentration may be because victims are more likely to feel fearful and unsafe in school. Ladd, Ettekel, and Kochenderfer-Ladd (2017) found that chronic victimization at a significant level produces the largest declines in academic achievement and school engagement. Additionally, students who were once victimized in an earlier grade but "exited" from victimization have higher scores on academic tasks and have a more positive view of their engagement and self-efficacy towards achievement than those who continued to experience victimization.

While victims are more likely to suffer from lower levels of academic achievement, perpetrators also have difficulty in school. Students who are perpetrators have lower levels of school adjustment and achievement than peers who do not perpetrate aggression (Nansel et al., 2001). They also are more likely to perceive the school climate as negative.

Similar to the studies examining predictors of victimization and perpetration, researchers have mainly focused on middle and high school students when assessing outcomes of victimization and perpetration. The studies including elementary students have focused on long-term outcomes in adolescence or early adulthood (e.g., Nansel et al., 2001; Olweus, 1978). As prevalence estimates have shown (e.g., Glew et al., 2005; Limber, Olweus, & Luxenberg, 2013), victimization and perpetration is occurring in elementary school and has the potential to greatly impact the immediate psychological and academic well-being of students. While these variables have been extensively studied in middle and high school, there have not been many studies that focus on consequences of victimization and perpetration in an elementary sample.

The most common consequences of aggression for students are increases in internalizing behaviors, increases in externalizing behaviors, and decreases in academic achievement. (e.g., DeVoe & Kaffenberger, 2005; Olweus, 1978). In general, both perpetrators and victims tend to have lower levels of academic achievement when compared to their non-bullied peers. In addition, victims and perpetrators exhibit significant internalizing behaviors like social anxiety, depression, and general anxiety, and more externalizing behaviors like aggression and hyperactivity.

Predictors of Victimization and Perpetration

Predictors of Aggression. While prior research regarding victimization and perpetration has primarily focused on middle school and high school, previous research regarding aggression

primarily has focused on younger students (e.g., Pepler & Rubin, 1991). Researchers have found that early ratings of aggressive behavior in childhood were significantly related to aggressive or antisocial behavior in adolescence and adulthood (Farrington, 1991; Loeber, 1982; Pulkkinen & Pitkänen, 1993). Further, Loeber (1982) reported that children who were aggressive were more likely to demonstrate higher levels of aggression as they aged.

Farrington (1991) also assessed the predictors of aggression in a sample of males between the ages of 8-10 and noted that children who were identified as aggressive were more likely to come from lower SES families. Additionally, children who came from large families or whose parents experienced unemployment were more likely to act aggressively. These children were also more likely to have parents who engaged in authoritarian parenting practices or used physical discipline. In addition, aggressive children were rated higher on impulsivity, had lower scores on intelligence tests, and had negative relationships with peers and teachers.

Similarly, Reid and Patterson (1989) found that lack of supervision and ineffective discipline were consistently related with aggressive or antisocial behaviors as children aged. These factors were found to mediate other variables that had previously been related to aggressive behavior, including child temperament, low SES, and parental involvement in crime. Nagin and Tremblay (2001) also noted that familial factors predict aggression in kindergarten boys. They found that boys who displayed increased physical aggression were more likely to have a mother with lower levels of educational attainment or who had given birth to children when they were teenagers. Further, Nagin and Tremblay (2001) found that increased levels of externalizing behaviors (e.g., hyperactivity or non-compliance) during kindergarten were predictive of aggressive behavior in adolescence.

While familial factors are important in predicting aggressive behavior, Kimonis and colleagues (2006) assessed how temperament affected aggressive behavior in a preschool sample. They observed that students who display "callous-unemotional traits" including a lack of empathy or emotional responsiveness were more likely to display aggressive behavior. The researchers also found that a lack of behavioral inhibition predicted aggressive behavior.

While some studies of aggression in childhood have included females (Pulkkinen & Pitkänen, 1993), most of the early aggression research focused on such behaviors in a males (e.g., Farrington 1991; Olweus, 1979). Furthermore, while perpetrators of aggressive behaviors were featured in this research, victims of aggression often were excluded from such studies. Due to the negative consequences of victimization, it is necessary to assess the predictors of both victimization and perpetration so that early screening and intervention can be implemented for both groups.

Predictors of Victimization and Perpetration. Researchers have studied a number of variables when assessing the predictors of victimization and perpetration ranging from individual variables like social skills, gender, and weight to contextual variables like school and home climate. Across these studies, several variables have emerged as key predictors of victimization and perpetration. Those predictors include variables in the areas of student demographic characteristics, psychosocial functioning, academic achievement, and contextual variables.

Student Variables. Demographic variables are commonly studied when assessing risk factors of victimization and perpetration (e.g., Alvarez-Garcia, Garcia, & Nunez, 2015). Most variables reflect personal factors (e.g., gender and race) or family factors (e.g., SES). In addition, these variables are most often included when researchers are assessing a combination of risk factors that may impact victimization or perpetration.

Gender has been a common variable of interest in victimization and perpetration research. Alvarez-Garcia, Garcia, and Nunez (2015) conducted a meta-analysis that assessed the personal and family risk factors associated with victimization and perpetration in adolescent students. A majority of the studies in this meta-analysis included gender as a predictor, and all but one study found that males tend to be perpetrators. Lovegrove, Henry, and Slater (2012) also observed that victimization is more likely to be experienced by adolescent males, while Gage, Prykanowski, and Larson (2014) stated that victimization is more likely to occur among girls in Grades 3-12. Furthermore, other research has found small or non-existent differences in predictors of victimization and perpetration across males and females in adolescence (Bosworth, Espelage, & Simon, 1999; Farrington & Baldry, 2010).

Much like gender, the findings for SES as a predictor of victimization and perpetration have been mixed. Some researchers have not found a significant relationship between SES and perpetration or victimization in adolescence (Alvarez-Garcia, Garcia, & Nunez, 2015). Others have concluded that students in middle school or late elementary school with low SES are more likely to experience victimization and perpetration (Jansen et al., 2011; Kim, Boyce, Koh, & Leventhal, 2009), and still others have suggested that middle school students of higher SES are more likely to be victims (Wei & Lee, 2014). Alvarez-Garcia, Garcia, and Nunez (2015) found different results depending on what indicators were used to measure SES (e.g., parent education level, annual income).

While variables like SES and gender tend to be more commonly studied, other variables, such as race, have not been considered nearly as often in the victimization and perpetration literature. Lovegrove, Henery, and Slater (2012) found that African-American adolescents are more likely to be perpetrators compared to other races; whereas, Gage, Prykanoswski, & Larson (2014)

reported that minority students are more likely to be the victims in Grade 3-12. However, Nansel et al. (2001) found that African American students are less likely to report victimization. Alvarez-Garcia, Garcia, and Nunez (2015) reported that studies assessing race generally indicate that minority groups tend to be victims more often than majority students. Additional studies are necessary, though, to assess race and its relation to victimization and perpetration given the limited studies to date.

Obesity also has been studied as a predictor of victimization. It has been found that victims are more likely to be obese when compared to perpetrators and their non-bullied peers (Alvarez-Garcia, Garcia, & Nunez, 2015; Kim, Boyce, Koh, & Leventhal, 2009). Like race, additional research is necessary to better understand the relationship between obesity and victimization and perpetration.

Behavioral Variables. Externalizing and internalizing behaviors have been frequently studied as predictors of perpetration and victimization. Adolescents who exhibit externalizing behaviors are more likely to be the perpetrators (Alvarez-Garcia, Garcia, & Nunez, 2015; Farrington, & Baldry, 2010). Perpetrators in adolescence are more likely to show lower levels of empathy, and have higher levels of aggression, hyperactivity, and impulsivity (Farrington, & Baldry, 2010). In addition, students who show higher levels of internalizing behaviors are significantly more likely to be perpetrators or victims in adolescence (Alvarez-Garcia, Garcia, & Nunez, 2015; Eastman, et al. 2018) and in elementary school (Glew et al., 2005). Internalizing behavior and increased negative thoughts moderately predict victimization (Cook, William, Guerra, Kim, & Sadek, 2010). These students show increased levels of internalizing behaviors like sadness (Glew et al., 2005).

Mitchell, Natesan, and Glover (2018) used the 1998-1999 cohort of the ECLS-K to predict perpetration and victimization status in eighth grade. They found that internalizing behaviors significantly predict victim status, while externalizing behaviors from first, third, and fifth grade predict perpetration status. These findings were consistent across parent, teacher, and student ratings of these behaviors. Mitchell et al. (2018) suggested that these areas may be important for intervention in schools to reduce the number of children experiencing victimization and perpetration in middle school.

Social skill deficits also have been examined as potential risk factors for perpetration and victimization. Victims often lack the ability to be assertive with their peers and are more likely to cry than non-victimized peers (Perry, Willard, & Perry, 1990). Fox and Boulton (2005) specifically assessed social skills deficits in students ages 9 to 11 years who were the victims. They found that both peers and teachers rate students as having greater deficits in social skills than non-victims. Teachers rate victims as having difficulty in social skills for items like "looks scared" and "will put up with other kids being nasty toward him/her" (Fox & Boulton, 2005). For peers, all but two items were associated with being a victim (e.g., "cries when picked on" or "runs away when picked on").

In addition, other researchers have found that lower levels of social skills have an impact on victimization and perpetration. Sentse, Veenstra, Kiuru, and Salmivalli (2015) found that victimization in students who were in the intermediate grades increases if students experienced higher levels of rejection, lower acceptance, and lower likeability as rated by their peers. Cook et al. (2010) also found that lack of social competence is a moderate predictor of victimization and perpetration for students in kindergarten through twelfth grade.

Both externalizing and internalizing behavior have been found to predict victimization and perpetration. With some exceptions (e.g., Glew et al., 2005), most of the effects of problem behaviors on victimization and perpetration have been studied with adolescents. While deficits in social skills have been found to be a predictor of victimization and perpetration, studies again focused on students in late elementary and adolescence (Fox & Boulton, 2005).

Contextual Variables. Family factors have been found to be important predictors of victimization and perpetration. Bowes et al. (2009) conducted a study to assess contextual and family factors and their relation victimization and perpetration in a longitudinal twin study conducted in Britain. Their results indicated that perpetration and victimization increase when children experienced negative family variables like domestic violence and child maltreatment. Georgiou and Fanti (2010) also assessed family characteristics and the relation to involvement in victimization and perpetration. They found that children whose parents do not give supervision and have lower levels of involvement in their child's life are more likely to be identified as a perpetrator. Georgiou and Fanti (2010) also noted that students whose parents engage in aggressive behaviors toward them are also more likely to perpetrate aggression against peers. Conversely, children who identify as having a positive relationship with their parents are less likely to engage in aggression and other problem behaviors (Bowes, Maughan, Caspi, Moffitt & Arseneault, 2010).

School climate is another area that researchers have examined relative to victimization and perpetration. School climate has been defined widely in the literature; however, numerous studies have found that school climate is a significant predictor of perpetration and victimization (Azeredo, Rinaldi, de Moraes, Levy, & Menezes, 2015; Gage, Prykanowski, & Larson, 2014; Sentse, Veenstra, Kiuru, and Salmivalli, 2015). Gage et al. (2014) included students in Grades

3-12 and found that respect for others' diversity and differences predicts lower overall involvement in perpetration. Azeredo et. al. (2015) also found that, regardless of the level, schools with strict rules or policies against bullying have less levels of aggressive behavior. Schools are also less likely to have students involved in victimization and perpetration if they express anti-bullying attitudes and are supportive of students known to be victims (Azeredo et al., 2015).

In addition to school climate, teacher and student relationships also appear to be an important predictor of involvement in victimization and perpetration. Alvarez-Garcia, Garcia, and Nunez (2015) found that adolescent students who are supported and are treated better by their teachers are less likely to experience victimization. In addition, Azeredo et al. (2015) found that lower levels of teacher support predict victimization when assessed in students in elementary school through high school. Donat, Knigge, and Dalbert (2017) also noted that as students who rate their relationship with their teachers as just and fair report lower levels of perpetration. However, they also found that classroom management is not a significant predictor of student involvement in victimization and perpetration. They reported that the results indicate the importance of a positive student-teacher relationship to reduce the participation in victimization and perpetration.

Overall, a number of studies have focused on contextual variables that predict victimization and perpetration among elementary school children. Several studies found effects of familial (Bowes et al., 2009) and school variables (Azeredo et al., 2015) on perpetration and victimization. Effects of contextual variables also have been observed in adolescence (e.g., Alvarez-Garcia, Garcia, & Nunez, 2015).

Purpose and Rationale

With the need for schools to address not only academic but also behavioral concerns, more schools are screening students for behavioral problems as students enter kindergarten (Serverson et al., 2006). The high prevalence of student victims and perpetrators (e.g., Lessne & Yanez, 2016; Luxenberg, Limber, & Olweus, 2015) necessitates that educators implement early screening measures to assess risk for victimization and perpetration. While most studies with a focus on victimization and perpetration to date have focused on broader emotional and behavioral problems, there is evidence to suggest that screening for aggressive behavior can be beneficial to students. Burk and colleagues (2011), for example, found that students identified as perpetrators and victims in Grade 1 were significantly more likely to engage in perpetration throughout elementary school, and they suggested that screening for aggression in Grade 1 could be beneficial to reduce negative outcomes experienced by these students.

Early screening of aggressive behaviors is essential to ensure that both perpetrators and victims receive supports and services. Early screening also directly informs intervention by determining the level of need of the students (Lane, Oakes, & Menzies, 2010). With the implementation of screening procedures and interventions to reduce peer aggression, schools can begin to assist children at-risk for becoming a perpetrator or victim. Reducing the number of children involved in victimization and perpetration or intervening before it becomes a more serious problem can have a significant impact on students by reducing some of the negative consequences of victimization and perpetration (Smokowski & Kopasz, 2005). The primary aim of the current study was to identify the key predictors of perpetration and victimization in the primary grades. Identifying these predictors will give schools some insight regarding which predictors may serve as useful targets for screening and intervention as students continue in the primary grades.

While a number of studies have focused on the predictors of victimization and perpetration, most either have been conducted outside of the United States (e.g., Farrington & Baldry, 2010; Kim, Boyce, Koh, & Leventhal, 2009) or with students in middle and high school (e.g., Cook et al., 2010). Even the studies that have been conducted with elementary school students in the U.S. (e.g., Jansen et al., 2011) focus on victimization and perpetration in fourth and fifth grades. Furthermore, it is important to assess predictors of victimization and perpetration in a large, nationally representative sample of students to ensure that results are generalizable to students in the United States.

Previous research regarding aggressive behavior has found that externalizing behaviors and familial factors are both a consistent predictor of later aggressive behavior (Farrington, 1991; Nagin & Tremblay, 2001). Additionally, some of the studies that were included in the aggression literature were conducted with children in elementary school (e.g. Farrington, 1991; Nagin & Tremblay, 2001). However, aggression literature focused on the perpetrators of aggressive behavior, and did not include the predictors of victim status. Additionally, because aggressive behavior was often more likely to be perpetrated by males (Farrington, 1991), females were not included in many studies within the aggression literature.

Data for the Early Childhood Longitudinal Study- Kindergarten Class of 2010-2011 were used to determine the potential risk factors in kindergarten, first grade, second grade, and third grade on victimization and perpetration in third grade. Although previous studies have included various predictors of perpetration and victimization, a common set of predictors has begun to emerge across these studies. These include behavioral (e.g., internalizing, externalizing, social skills) and contextual (teacher - student relationships, school climate, and parental use of physical discipline) variables. As such, these variables were the primary predictors of interest in

the current study. Additionally, the variables of race, gender, SES, and obesity were included as student variables.

The following research questions framed the study:

1. What student, behavioral, and contextual variables in kindergarten, first grade, second grade, and third grade significantly predict third grade perpetration?
2. What student, behavioral, and contextual variables in kindergarten, first grade, second grade, and third grade significantly predict third grade victimization?

Chapter 2: Method

Participants

Data were drawn from the Early Childhood Longitudinal Study- Kindergarten (ECLS-K) Class of 2010-2011 which features a nationally representative sample of students who attended kindergarten in 2010-2011. A total of 18,174 students participated in at least one of the two initial data collection waves (fall or spring) during kindergarten. Students in both public and private schools as well as partial and full-day kindergarten were included. In addition, parents, teachers, administrators, and after-school care workers provided information about their children. While the ECLS-K data were collected from a number of informants, only child, parent, and teacher data were used in the current study.

The design of the ECLS-K included sampling children with a probability that was close to the same for each child. The ECLS-K used a multi-stage sampling design that used primary sampling units (PSUs; Tourangeau et al., 2017). Specifically, the PSUs were counties within the United States from which schools are sampled. A fixed number of students were sampled from each of the 1,221 schools included in the sample.

The PSU sampling weights were used in the data analysis for each of the equations. Furthermore, the ECLS-K includes weights to ensure the representativeness of the sample (Tourangeau et al., 2017). A stratified sample was used to ensure that subpopulations within the sample were adequately represented. Student participants were recruited from these schools based on targeted demographic characteristics such as race, SES, etc. (Tourangeau et al., 2017). The ECLS-K oversampled Asians, Native Hawaiians, and Other Pacific Islanders to meet the goals for the sample size (Tourangeau et al., 2017). The stratified sample weights were included in the data analysis of the current study. Lastly, full sample weights were also included in the data analysis. The full sample weights accounted for nonresponse of the participants Student

demographic information collected when the students entered the kindergarten wave of data collection are reported in Table 1.

Table 1

Demographic Variables for the Kindergarten Sample of the ECLS-K 2010-11

Domain	%
Female	48.8
White	46.8
Black	13.2
Hispanic	22.9
Asian	8.5
Native Hawaiian	0.6
American Indian	0.9
2 or more races	4.6
Age at kindergarten entry, years	5.7
Median family income	$47,000

Note. N=18,174

Measures

Based on the results of the literature review, the following variables were included as predictors of being a victim or perpetrator: behavioral variables (social skills, externalizing behavior, and internalizing behaviors) and contextual variables (teacher and student relationships, school climate, and parental use of physical discipline).[1] Race, gender, SES, and obesity were included as student variables.

Student Variables. Student variables were collected via parent questionnaires and phone interviews. For the current study, gender, race, socioeconomic status (SES), and obesity were the primary student variables of interest. Gender and race were collected from parents during a phone interview or were gathered from school records when parents did not indicate a response (Tourangeau et al., 2004). Parents indicated if their child was either male or female. (Male was coded as 0 and female was coded as 1.) The ECLS-K included seven categories (White, Black,

Hispanic, Asian, Native Hawaiian/Pacific Islander, American Indian or Alaskan Native, and Other) for race.

The ECLS-K SES variable represents a composite of parental education, occupation, and household income. Parents were asked their highest year of schooling completed. In addition, they were asked to indicate if they were completing any college course or any job training. For occupation, parents were first asked if they, or someone else in the home, had a job. If the parents indicated they had a job, they were asked what their job was, what industry the job was in, and the length of time they had been employed. Parents also were asked how long, if ever, they were in financial trouble in the child's life. The SES variable then was generated by including all data into an equation and calculating a z-score for each student (Tourangeau et al., 2004).

Finally, body weight and height were assessed for all students during the fall and spring of kindergarten, first grade, second grade, and third grade. These two variables were used to calculate a BMI score for each student (BMI is calculated by weight in kilograms divided by height in meters squared). These BMI scores were then recoded into 0 for BMI $\leq$ 29 and 1 for BMIs $\geq$ 30. These codes were based on the classification used by the National Institute of Health (1998) to define obesity.

Aggression (Perpetration and Victimization). Perpetration and victimization were the criterion variables in the current study. The ECLS-K investigators did not label the variables as perpetration and victimization because they did not meet the federal definition of bullying. Instead, they labeled the variable as peer victimization. The federal definition of bullying is similar to that of Olweus (1993), which includes an imbalance of power and repetition of the bullying behavior, and these variables were not assessed in the ECLS-K: 2011. The questions

for the ECLS-K aggression scales, however, were adapted from a popular scale of bullying behavior, the Illinois Bullying Scale (Espelage & Holt, 2001). Therefore, scores from this scale were used as measures of perpetration and victimization as they included questions related to aggression.

Perpetration and victimization questions were gathered via self-report questionnaires completed by students in third grade. Students were asked four questions about aggression that they experienced in the third-grade school year. (For example, "During this school year, how often have other students told lies or untrue stories about you?") Students were asked to rate if the behavior described in each question *Never, Rarely, Sometimes, Often,* or *Very often* happened to them. The student questionnaires were administered to each student during the school day. (Questions for victimization can be found in Appendix A.)

In addition, parents and teachers both reported if a child was a perpetrator or victim during the third grade assessment. However, only teacher ratings of perpetration were used in the current study, as teachers have more knowledge about behavior during the school day and often directly observe perpetration in the school setting. Teachers were asked to respond using a 5-point Likert scale (*Never, Rarely, Sometimes, Often,* or *Very often*) to four questions about if the student was aggressive toward other students. For example, "During this school year, has this student ever teased, made fun of, or called other students names?" Questions for the teacher ratings can be found in Appendix B.

Behavioral Variables

Social Skills. Social skills were assessed through teacher ratings using the Social Rating Scale (SRS). The SRS was adapted from the Social Skills Rating Scale (Gresham & Elliott, 1990). A number of areas were measured, including social interaction, attentional focus, and self-control.

Teachers rated social skills on nine items (Tourangeau et al., 2017). The ECLS-K provides two composite scales that measure social skills: Interpersonal Skills and Self-Control. With regard to reliability, internal consistency estimates were reported for each of the scales of the SRS. On the teacher scales, reliability was found to be .79 - .82 for Self-Control and .85 - .88 in Interpersonal Skills.

Externalizing and Internalizing Behaviors. In addition to measuring social skills, the SRS includes a rating of externalizing and internalizing problem behaviors on the teacher and parent rating scales. The teacher scale included nine questions (5 internalizing, 4 externalizing) and was used in the current study. Split-half reliability estimates for the scale were found to be .87 - .89 for externalizing behaviors and .76 - .79 for internalizing behaviors (Tourangeau et al., 2017).

Contextual Variables

Student and Teacher Relationships. Student and teacher relationships were assessed using the Student-Teacher Relationship Scale (STRS; Pianta, 2001). The STRS includes 15 items with a 5-point Likert scale (*Definitely does not apply, Not really, Neutral, Applies somewhat, Definitely applies*) that assessed the teachers' perception of their closeness and conflict with the child of interest (Tourangeau et al., 2012). The Closeness composite assesses positive communication, warmth, and affection. The Conflict composite assesses the negative aspects of the relationship with the child. With regard to reliability in kindergarten, first, second and third grade, the Closeness scale had Cronbach's alpha from .86 - .89, while the Conflict scale had Cronbach's alpha ranging from .88 - .90 (Tourangeau et al., 2017).

School Climate. Questions about school climate were assessed via teacher questionnaires in the spring of each grade level. The school climate scale is a 12-question Likert-scale (*Strongly Agree, Agree, Neither Agree* or *Disagree, Disagree, Strongly Disagree*). The scale focuses on

teacher perceptions of support from parents and administrators, cooperation and respect among colleagues, misbehavior of students, and academic standards set by the administration (Tourangeau et al., 2017). The ECLS-K dataset includes a composite for school climate.

Parental Use of Physical Discipline. During the spring of kindergarten, parents were asked "Do you spank {Child}?" as part of the ECLS-K parent interview. Parents could either answer "Yes" or "No." Responses to this question were used as an indicator parental use of physical discipline.

Procedures

All student measures were collected at the child's school by trained research staff. Teacher data were completed via self-administered paper questionnaires. Parents were interviewed either in-person or over-the-phone to obtain demographic, health, and familial information. The predictors of interest were drawn from the spring wave of data in kindergarten, first, second, and third grade. The criterion variables, perpetration and victimization, were only collected in the spring of third grade. Additional information regarding specific ECLS-K 2011 data collection procedures can be found in the User's Manual for the kindergarten through third grade data collection waves (Tourangeau et al., 2017).

Data Analysis

Prior to data analysis, all continuous variables were standardized as z-scores. A total of eight logistic regression equations – four each for perpetration and victimization - were tested. Although each of these equations included the same set of predictor variables, the equations differed by when the predictors were collected (kindergarten, first, second, or third grade), with the exception of parental use of physical discipline. Because parental use of physical discipline was only measured during kindergarten, this variable was included as a predictor in the

kindergarten equations. It also was included as a covariate in the first, second, and third grade equations. The student variables of race, gender, SES, and obesity were entered first as covariates in all equations. Then the behavioral (social skills, internalizing behavior, and externalizing behavior) and contextual variables (teacher and student relationships, school climate, and parental use of physical discipline) were entered into the analysis simultaneously.

Before examining the relationship between the predictor and outcome variables, several assumptions were tested. Multivariate normality was evaluated using scatterplots to ensure that the independent variables were linear (Field, 2013). Normality also was examined through the Shapiro-Wilks test. In addition, multicollinearity was assessed using the variance inflation factor (VIF) and bivariate correlation coefficients. Finally, linearity was examined via a residual plot at each level of the predictor variables (Cohen & Cohen, 1983). Results of the regression analysis were interpreted for statistical significance. The *p*-value was assessed to determine the overall fit of the model, as well as the statistical significance of each predictor. Data were analyzed using SPSS version 24.0 for Windows.

Chapter 3: Results

Preliminary Analysis

Approximately 30 - 35% of the data were missing from the dataset for each regression analysis. Little's Missing Completely at Random (MCAR) test was statistically significant at each grade level, indicating that the missing data were not MCAR. However, full sample weights were used for the analysis to account for non-response of the participants. Additionally, the stratified sample weight and primary sample weight was used in the analysis of each of the models.

The outcome variables of victimization (M = 2.17; SD = .81) and perpetration (M = 1.49; SD = .71) were screened for normality. Both bully perpetration (skew = 1.85; kurtosis = 3.62) and bully victimization (skew = .63; kurtosis = -.25) were within ranges acceptable for normality for the z-critical value at the p = .01 level (Field, 2013). However, visual inspection of boxplots and histograms suggested some evidence of non-normality for each of these variables[2]. The scatterplots for perpetration and victimization indicated that they were low incidence behaviors. As a result, both perpetration and victimization were recoded as dichotomous variables and analyzed via logistic regression.

For the analysis for the current study, responses from the victimization and perpetration scales were recoded into binary categories. The binary scale was used to identify students as perpetrators or victims by classifying scores as *Rarely* or below as not involved in peer victimization, while scores as *Sometimes* (or above) were classified as engaging in bullying behavior. This classification was based on Olweus's definition of bullying behavior, which indicates that the bullying behavior has to occur repeatedly between both parties involved in the act (Olweus, 1993). Therefore, students who either classified themselves as *Never* or *Rarely* victims were re-classified as not having experienced peer victimization and coded as 0. A

student who indicated that they *Sometimes, Often,* or *Very Often* were a victim were recoded as 1 (being a victim of peer victimization). The same procedure was followed for the teacher ratings of perpetration.

Each predictor variable was assessed for normality at each time point (kindergarten, first, second, and third grade level). Skew and kurtosis for each predictor variable (Table 1) were within the ranges acceptable for normality for the *z*-critical value at the $p = .01$ level (Field, 2013). Visual inspection of boxplots and histograms for the variable of teacher closeness indicated negative skew, while the variables of externalizing behavior, internalizing behavior, and teacher conflict indicated positive skew in kindergarten, first grade, second grade, and third grade. Negative skew also was present for interpersonal skills and self-control across all grade levels. However, both skew and kurtosis values were within the acceptable range for normality. Thus, the assumption of non-normality does not appear to be significantly violated.

Univariate outliers were assessed through a visual inspection of histograms and boxplots. All variables, with the exception of parental use of physical discipline, yielded univariate outliers. The mean for each of the variables, however, was similar to the 5% trimmed mean indicating that outliers did not have a significant influence on the variables (Tabachnick & Fidell, 2007). Examination of residual scatter plots indicated heteroscedasticity. Multivariate outliers were examined using the Mahalanobis Distance, and though some multivariate outliers were found within individual predictor variables, the majority (approximately 95%) did not exceed ($p > .05$) the Chi-square critical value (Tabachnik & Fidell, 2007). Given the low number of multivariate outliers and lack of evidence for univariate outliers, all data were retained for analysis.

A number of methods was used to screen for multicollinearity. Bivariate correlation coefficients were assessed between each predictor and outcome variable (see Appendices C-F).

Applying Cohen's guidelines (1988), small to moderate correlations were found between each outcome and predictor variable (r = .00 - .44). While some correlations were in the small range (r = .00-.20), most correlations between the predictor variables were in the upper end of the moderate to large range (r = .21 - .84). The variables of internalizing behavior, teacher closeness, physical discipline, and school climate were in the acceptable range for the variance inflation factor. However, the variables of self-control, interpersonal skills, externalizing behaviors, and teacher conflict for bully victimization and perpetration in kindergarten, first grade, second grade, and third grade were above the acceptable range. While some of the aforementioned statistics show evidence of multicollinearity for the variables of self-control, interpersonal skills, externalizing behaviors, and teacher conflict, others indicate multicollinearity was not present. Therefore, all of the variables were retained for data analysis.[3]

Table 2

Descriptive Statistics for the Kindergarten, First Grade, Second Grade, and Third Grade Predictors (N=18,174)

Variable	Kindergarten			First Grade			Second Grade			Third Grade		
	M (*SD*)	Skew	Kurtosis	*M* (*SD*)	Skew	Kurtosis	*M* (*SD*)	Skew	Kurtosis	*M* (*SD*)	Skew	Kurtosis
BMI	16.60 (2.51)	2.12	8.78	17.05 (2.97)	1.96	6.71	17.76	1.77	5.74	18.58 (3.99)	1.39	3.10
Sex	.49 (.50)	.05	-1.99	.49 (.50)	.05	-1.99	.49 (.50)	.05	-1.99	.49 (.50)	.05	-1.99
SES	-.05 (.81)	.30	-.44	-.05 (.81)	.26	-.53	-.05 (.81)	.27	-.50	-.05 (.81)	.29	-.51
Race	.53 (.50)	-.13	-1.98	.53 (.50)	-.13	-1.98	.53 (.50)	-.13	-1.98	.53 (.50)	-.13	-1.98
Closeness	4.35 (.64)	-1.19	1.20	4.29 (.67)	-1.17	1.20	4.32 (.69)	-1.02	.68	4.15 (.72)	-.98	.70
Conflict	1.63 (.80)	1.74	1.74	1.63 (.79)	1.61	2.11	1.61 (.78)	1.67	2.24	1.60 (.77)	1.69	2.36
Self-Control	3.18 (.64)	-.57	-.41	3.21 (.62)	-.64	-.37	3.23 (.63)	-.66	-.35	3.27 (.62)	-.74	-.25
Interpersonal Skills	3.13 (.65)	-.42	-.66	3.14 (.66)	-.45	-.66	3.13 (.66)	-.41	-.73	3.13 (.66)	-.46	-.64
Externalizing	1.64 (.64)	1.23	1.37	1.72 (.62)	1.12	1.09	1.71 (.62)	1.10	.93	1.68 (.61)	1.17	1.18
Internalizing	1.51 (.50)	1.35	2.42	1.54 (.50)	1.38	2.03	1.58 (.52)	1.26	2.07	1.60 (.53)	1.32	2.12
School Climate	3.95 (.52)	-.40	.12	3.90 (.53)	-.47	2.56	3.88 (.53)	-.36	.23	3.25 (.39)	-.45	.90
Physical Discipline	1.47 (.50)	.11	-1.99	1.47 (.50)	.11	-1.99	1.47 (.50)	.11	-1.99	1.47 (.50)	.11	-1.99

Perpetration

The kindergarten, first grade, second grade, and third grade set of predictor variables were each regressed on perpetration in third grade (Table 3). Each predictor variable was examined for statistical significance.

Kindergarten. The covariates of sex and SES were both statistically significant. With regard to kindergarten predictors, externalizing behavior emerged as statistically significant. All other behavioral variables were not statistically significant. Teacher closeness and conflict also emerged as statistically significant predictors. School climate was not significant. During kindergarten, parental use of physical discipline also was statistically significant.

First Grade. Sex, SES, and parental use of physical discipline were all statistically significant covariates during first grade. Similar to kindergarten, externalizing behavior was the only statistically significant predictor among the behavioral variables. The contextual variable of teacher-student conflict also was a statistically significant predictor of perpetration in third grade. Both school climate and student-teacher closeness, however, were not statistically significant.

Second Grade. As with kindergarten and first grade, sex and SES were statistically significant covariates in second grade. Again, externalizing behaviors emerged as a statistically significant predictor of perpetration; however, the predictors of internalizing behavior and self-control also emerged as significant. With regard to the contextual variables, student-teacher closeness represented the only statistically significant predictor of perpetration.

Table 3

Kindergarten, First Grade, Second Grade, and Third Grade Predictors of Perpetration in Third Grade

	Kindergarten				First Grade				Second Grade				Third Grade			
Predictor	B	SE	OR	*P*	B	SE	OR	*p*	B	SE	OR	*p*	B	SE	OR	*P*
BMI	.36	1.05	1.44	.54	.42	.55	1.53	.44	.25	.42	1.28	.56	-2.01	1.06	.13	.06
Sex	.75	.17	2.11	.00	.54	.19	1.72	.00	-.28	.09	.75	.00	.24	.19	1.27	.20
SES	-.51	.11	.60	.00	-.41	.12	.66	.00	-.36	.06	.70	.00	-.35	.12	.71	.00
Race	-.14	.16	.87	.40	-.08	.18	.93	.66	-.07	.10	.93	.45	-.16	.18	.85	.34
Physical Discipline	.38	.16	1.46	.02	.45	.17	1.57	.01	.04	.09	1.04	.68	.36	.17	1.43	.03
Externalizing	.45	.11	1.56	.00	.44	.12	1.55	.00	.32	.07	1.38	.00	.38	.11	1.46	.00
Internalizing	-.07	.08	.93	.33	.03	.07	1.03	.72	.11	.05	1.11	.02	-.17	.07	.84	.02
Self-Control	-.18	.15	.83	.23	-.15	.15	.86	.34	-.18	.09	.84	.04	-.68	.17	.51	.00
Interpersonal	-.12	.14	.89	.40	-.29	.15	.75	.06	-.04	.08	.96	.61	-.53	.16	.59	.00
Climate	.03	.08	1.03	.71	-.02	.08	.98	.78	-.01	.05	.99	.88	-.05	.08	.95	.54
Closeness	.25	.09	1.29	.01	.08	.09	1.08	.39	.19	.06	1.21	.01	.01	.09	1.01	.89
Conflict	.34	.10	1.41	.00	.27	.10	1.31	.01	.00	.07	1.00	.98	.54	.09	1.71	.00

Third Grade. In the third-grade sample, SES and physical discipline were statistically significant predictors of perpetration. With regard to the behavioral variables, all emerged as statistically significant predictors in third grade, including externalizing behavior, internalizing behavior, self-control, and interpersonal skills. For the contextual variables, student-teacher conflict was the only statistically significant predictor of perpetration. All other contextual variables were not significant.

Victimization

The kindergarten, first grade, second grade, and third grade were separately regressed on victimization in third grade. Results of these logistic regression equations appear in Table 4.

Kindergarten. During kindergarten, sex and SES were statistically significant covariates. With regard to behavioral variables, externalizing behaviors and self-control were both statistically significant in predicting victimization in third grade. For the contextual variables, student-teacher closeness emerged as a statistically significant predictor of victimization; however, school climate and student-teacher conflict were not statistically significant.

First Grade. Similar to kindergarten, both sex and SES were statistically significant covariates of victimization. Externalizing behavior again emerged as a statistically significant predictor of victimization; however, this was the only statistically significant behavioral variable in the first-grade model. With regard to the contextual variables, student-teacher closeness was again a significant predictor of victimization, while the other contextual variables did not emerge as significant.

Second Grade. For second grade, the covariates of sex and SES were again statistically

significant. Similar to the findings for perpetration during second grade, all of the behavioral variables were statistically significant. Student-teacher conflict emerged as the only significant contextual variable, which differed from the other victimization equations.

Third Grade. Consistent with all other victimization equations, sex and SES were both statistically significant covariates. Externalizing behavior again emerged as a significant predictor; however, internalizing behavior also was a statistically significant predictor of victimization. With regard to contextual variables, student-teacher closeness was the only statistically significant predictor of victimization in third grade.

Table 4

Kindergarten, First Grade, Second Grade, and Third Grade Predictors of Victimization in Third Grade

	Kindergarten				First Grade				Second Grade				Third Grade			
	B	SE	OR	*P*	B	SE	OR	*p*	B	SE	OR	*P*	B	SE	OR	*P*
BMI	.37	1.06	1.45	.73	.38	.57	1.46	.50	-.79	1.04	.45	.45	.29	.30	1.34	.34
Sex	-.23	.09	.80	.01	-.38	.09	.68	.00	.61	.18	1.84	.00	-.40	.09	.67	.00
SES	-.39	.06	.68	.00	-.40	.06	.67	.00	-.37	.12	.69	.00	-.36	.06	.70	.00
Race	-.02	.09	.99	.87	-.05	.10	.95	.62	-.25	.17	.78	.13	-.05	.09	.96	.63
Physical Discipline	.03	.09	1.04	.69	.05	.09	1.05	.56	.50	.16	1.65	.00	.05	.09	1.05	.59
Externalizing	.15	.07	1.16	.04	.23	.07	1.26	.00	.27	.11	1.31	.01	.31	.07	1.36	.00
Internalizing	-.02	.05	.98	.64	.00	.05	1.00	.97	-.16	.08	.85	.04	.11	.04	1.11	.02
Self-Control	-.21	.09	.81	.01	-.15	.09	.86	.08	-.31	.15	.73	.04	-.13	.08	.87	.11
Interpersonal Skills	.02	.08	1.03	.76	-.04	.08	.96	.64	-.39	.15	.68	.04	-.10	.08	.91	.23
Climate	-.08	.04	.92	.06	-.02	.05	.98	.61	-.00	.08	.99	.96	.02	.05	1.02	.65
Closeness	.11	.06	1.12	.05	.12	.06	1.13	.03	.08	.09	1.08	.37	.21	.06	1.23	.00
Conflict	.13	.07	1.13	.06	.08	.07	1.01	.22	.35	.10	1.41	.00	.05	.06	1.05	.41

Chapter 4: Discussion

The purpose of the current study was to identify the early predictors of being either a victim or perpetrators of peer victimization during the primary grades. Using data from the Early Childhood Longitudinal Study-Kindergarten Class of 2010-11 and logistic regression, predictive relationships between student, behavior, and contextual variables and peer victimization (perpetration and victimization) were tested across multiple time points. Overall, results indicated that behavioral variables, specifically externalizing behavior, was the most consistent predictor of both perpetration and victimization, while student variables (e.g., SES and race) and contextual variables (e.g., school climate) were less salient in predicting bullying behavior.

Interpretation of Perpetration Findings

Covariates. From kindergarten to third grade, SES emerged as statistically significant. Specifically, as SES increased, the likelihood of being identified as a perpetrator decreased. In kindergarten and first grade, being male increased the odds of being identified as a perpetrator in third grade. Previous research has found mixed results for student characteristic variables such as SES (e.g. Alvarez-Garcia, Garcia, & Nunez, 2015; Bosworth, Espelage, & Simon, 1999; Farrington & Baldry, 2010). Similar to the research on SES, some previous research has found that being male is a significant predictor of bullying behavior in primary and secondary grades (Alvarez-Garcia, Garcia, & Nunez, 2015), while other studies have found differences to be small or nonexistent (Bosworth, Espelage, & Simon, 1999; Farrington & Baldry, 2010).

Contrary to what was observed in kindergarten and first grade, being female in second grade increased the odds of being identified as a perpetrator and represented a stronger effect than the previous models. This finding also differs from most findings in previous research (e.g., Garcia,

Garcia, and Nunez, 2015); however, a study by Craig (1998) found that both verbal and physical aggression increase as girls moved from fifth to eighth grade. Craig (1998) also noted that physical aggression tends to decline with age, while relational aggression increases as students progress through the grades. Further, Putallaz et. al. (2008) found that girls were significantly more likely to engage in relational forms of aggression and less likely to engage in physical aggression during fourth grade. Although these studies focus on older children, the current study found that girls in third grade were more likely to be perpetrators. As relational aggression tends to increase with age, girls may be more likely to engage in perpetration as they move through the primary grades (Putallaz et. al., 2008).

Behavioral variables. Across all grade levels, externalizing behavior demonstrated statistically significant relationships with being identified as a perpetrator. These results are consistent with previous studies that found that externalizing behavior is a strong predictor of bully perpetration (Alvarez-Garcia, Garcia, & Nunez, 2015; Eastman et al., 2018; Farrington, & Baldry, 2010). They are also consistent with a recent study using the ECLS-K 1998-1999 wave (Mitchell, Natesan, & Glover, 2018) which found that externalizing behaviors predicted 42% of the variance explained in eighth grade perpetration (Mitchell, Natesan, & Glover, 2018).

During second grade, higher ratings of internalizing behavior increased the odds of being identified as a perpetrator. In third grade, though, higher ratings on internalizing problems decreased the odds of being identified as a perpetrator, which was the opposite relationship expected given results of previous literature (e.g., Alvarez-Garcia, Garcia, & Nunez, 2015; Glew et al., 2005). Previous studies documenting a connection between perpetration and internalizing behavior have used samples from one school or district (Glew et al., 2005); whereas others have focused on samples outside of the United States (Alvarez-Garcia, Garcia, & Nunez, 2015). The

ECLS-K, however, used a nationally representative sample of U.S. students that included multiple states and school settings. Thus, differences in findings could be due to sample differences.

Another possible explanation for the difference in findings is that measures of internalizing behaviors tend to vary by study. Some studies have focused on a narrower set of behaviors, including depression or anxiety symptoms (Alvarez-Garcia, Garcia, & Nunez, 2015; Glew et al., 2005). Previous research has found that some internalizing behavior (e.g., depression and suicidal ideation) significantly predict involvement in bullying behavior, while other internalizing behavior (e.g., anxiety) is not a strong predictor (Alvarez-Garcia, Garcia, & Nunez, 2015). While the ECLS-K used a measure of internalizing behavior adapted from a published rating scale with strong psychometric properties (SSRS), it did not assess specific aspects of internalizing behavior, such as anxiety or depression.

Similarly, higher ratings of prosocial skills (self-control & interpersonal skills) across second and third grade decreased the odds of being identified as a perpetrator. Previous research has focused on social skills as a predictor of victimization; however, a meta-analysis by Cook et al. (2010) found that lower ratings on social skills predict future involvement in bully perpetration from early elementary school to adolescence. These findings indicate that prosocial behaviors may have more predictive power when they are measured in closer proximity to the outcome variable of interest.

Contextual variables. While externalizing behavior emerged as the strongest predictor of perpetration, there were several other statistically significant contextual variables, including student-teacher relationships. As ratings of student-teacher conflict increased, the odds of being identified as a perpetrator increased in kindergarten, first grade, and third grade. These findings

are consistent with previous research that students who have positive relationships with teachers are less likely to engage in bullying behavior (Alvarez-Garcia, Garcia, and Nunez, 2015; Donat, Knigge, & Dalbert, 2017). Additionally, teachers provided ratings of both student-teacher relationships and perpetration in the ECLS-K. Students who have more conflict with their teachers may also have been perceived to have more conflict with their peers.

One unexpected finding, though, was that as student-teacher closeness increased during kindergarten and second grade, the odds of being identified as a perpetrator also increased. This differs from previous literature that has found positive student-teacher relationships decrease perpetration (Alvarez-Garcia, Garcia, and Nunez, 2015; Donat, Knigge, & Dalbert, 2017). Additionally, student-teacher conflict was found to increase the odds of being identified as a perpetrator in the current study. One potential explanation could be that children who perpetrate aggression against peers may receive more attention from their teachers. Further, the odds ratios for student-teacher closeness was were smaller than those for student-teacher conflict. Yet, they were statistically significant due to the power resulting from the large sample size.

As parents indicated that they had used physical discipline on their child in kindergarten, the odds of being identified as a perpetrator increased. These results are not surprising, given the number of studies indicating that modeling of physical violence by an adult increases the likelihood of the child engaging in physical violence in the future (Bandura, Ross, & Ross, 1961; Ohene, Ireland, McNeely, & Borowsky, 2006). Parental use of physical discipline remained a significant covariate during first grade and third grade. Specifically, as parents indicated that they had used physical discipline, the odds of being a perpetrator increased.

School climate was not a statistically significant predictor of perpetration in this study. While previous research has found that school climate was a significant predictor of bullying behavior

(e.g., Gage, Prykanowski, & Larson, 2014), the definition and measures of school climate have varied widely between studies. Differing definitions of school climate could impact the predictive relationship between climate and bully perpetration or victimization (Steffgen, Recchia, & Viechtbauer, 2013). For example, the ECLS-K measure of school climate focused on teacher perception of support by parents and administrators and cooperation and respect among colleagues. In contrast, Gage, Prykanowski, and Larson (2014), used a more comprehensive measure of school climate that was completed by students and included questions regarding school safety and perception of adult support at school and home. In the Gage, Prykanowski, and Larson (2014) study, school climate was a strong predictor of involvement in bullying behavior.

In sum, externalizing behavior emerged as the most consistent positive predictor of bully perpetration across grade levels. Further, student-teacher closeness and conflict both emerged as statistically significant predictors from kindergarten to third grade. Additional significant predictors were observed in second and third grade including internalizing behavior and social skills.

Interpretation of Victimization Findings

Covariates. During kindergarten through third grade sex and SES were statistically significant covariates of victimization. As previously noted, the relationship between student variables and victimization tends to be mixed in the literature. Some researchers have found little to no effect when studying student characteristics (e.g., Bosworth, Espelage, & Simon, 1999) with victimization.

Behavioral variables. Similar to the results for perpetration, externalizing behavior in the primary grades increased the odds of being identified as a victim in third grade. While most

prior studies have focused on externalizing variables and their relation to perpetration, some have found that externalizing behavior also is associated with victimization (Reijntjes et al., 2011). The current study also found externalizing behavior to be a strong predictor of bully perpetration. The significance for externalizing behavior for both perpetrators and victims indicates that externalizing behavior may be a key predictor in screening for aggression at the elementary level.

Although statistically significant in first and third grade, internalizing behavior demonstrated negligible relationships with victimization. During second grade, the odds of being identified as a victim decreased as ratings on internalizing behavior increased; however, the opposite relationship was found in third grade. These results are surprising given that internalizing behavior previously has been found to predict victimization in both elementary and secondary school (Glew et al., 2005; Mitchell, Natesan, & Glover, 2018). Again, these findings could be attributable to measurement considerations. For example, Glew et. al. (2005) asked students if they felt "sad most days" to measure internalizing behaviors. The ECLS-K, however, included multiple questions about internalizing behaviors that were completed by teachers. Due to the nature of internalizing behaviors, teachers may have a hard time observing these behaviors in the classroom. Stanger and Lewis (1993) found that teachers have a tendency to report the fewest internalizing behaviors relative to parents and children. Because teachers may have a tendency to underreport internalizing behaviors, they may not have emerged as a stronger predictor in the current study.

With regard to social skills, as teachers rated students higher on self-control, the odds of them being identified as a victim decreased at kindergarten and second grade. Interpersonal skills only emerged as a statistically significant predictor during second grade. Previous studies have found

that social skills deficits as rated by students, teachers, and peers strongly predict being victimized by peers (e.g., Cook et al., 2010; Fox & Boulton, 2005); however, some of these previous studies have focused on variables like social competence, self-related thoughts, and social problem-solving (Cook et al., 2010). While social competence may be similar to interpersonal skills or self-control as measured in the current study, other areas like social problem solving were not assessed in the ECLS-K. Further, other studies included in the meta-analysis by Cook et. al. (2010) included reports of social skills from different informants, including peers, teachers, parents, and self-ratings.

Contextual variables. With regard to contextual variables, parental use of physical discipline was a statistically significant predictor of being a victim during second grade. These results are consistent with previous research that students whose parents used physical discipline were more likely to become victims (Georgiou & Fanti, 2010). Parental use of physical discipline was not statistically significant at any other grade level.

Student-teacher relationships emerged as statistically significant during kindergarten and second grade. In kindergarten, first grade, and third grade, higher ratings of student-teacher closeness significantly increased the odds of being identified as a victim. Alvarez-Garcia, Garcia, and Nunez (2015) found that students who feel supported by their teacher report lower levels of victimization; however, their study featured student report of these relationships, while the ECLS-K used teacher report of these variables. Additionally, Alvarez et al. focused on teacher- student relationships in adolescent samples. During second grade, higher ratings of student-teacher conflict increased the odds of being identified as a victim. This variable was not significant during the other grade levels, though.

The variable of school climate was not statistically significant across the grade levels. For student-teacher relationships, higher ratings of student-teacher conflict in first and second grade decreased the odds of being identified as a victim, but again the odds ratio was small. The statistical significance of school climate and student-teacher conflict is likely due to the large sample size. Previous research has found that school climate (Azeredo, et. al., 2015) and student-teacher relationships do predict peer victimization behavior; however, researchers have tended to define these variables in different ways. For example, Azeredo et. al., (2015) focused on school discipline policies as their measure of school climate. The ECLS-K used teacher reports of school climate that included teacher perceptions of support for parents and administrators, cooperation and respect among colleagues, misbehavior of students, and academic standards set by the administration. These differences in measurement of variables could significantly impact their contributions as predictors.

Consistent with the results of bully perpetration, externalizing behavior emerged as the most consistent predictor of victimization across grade levels. Similarly, other behavioral and contextual variables that were statistically significant (e.g., internalizing behavior, parental use of physical discipline) typically did so in only one or two of the grade levels. Also, more relationships emerged as statistically and practically significant as the predictor variables were measured in closer proximity to the criterion time point.

Limitations

There were several limitations to the current study. Given the amount of measures administered as part of the ECLS-K, rating scales tend to be short, including the measures of perpetration and victimization used in the current study which each included four questions. Due to the limited number of questions, important aspects of the construct may not have been

measured. Using more comprehensive scales would allow researchers to measure a wider array of behaviors associated with a given construct. For example, the ECLS-K measure of prosocial skills only included interpersonal skills and self-control, while social skills deficits, such as difficulty with communication or lack of empathy, may be a more significant predictor of involvement in peer victimization (e.g. Cook et al., 2010; Fox and Boulton, 2005). Further, while self-control and interpersonal skills are important aspects of social skills, other areas like social awareness, self-awareness, self-management, and problem-solving ability have been linked to a reduction in involvement in peer victimization (Ozer, 2018). Additionally, the definitions of purportedly similar constructs (e.g., social skills, school climate, etc.) tend to vary widely across studies. For the ECLS-K, researchers assessed school climate by examining teacher perceptions of administrative support, adequacy of training, and parental involvement. The ECLS-K did not assess students' perceptions of school climate, including school safety or discipline policies within the school (Azeredo et. al., 2015). Assessing differing variables that are labeled as the same construct may affect the statistical and practical significance of a predictor and its relation to peer victimization.

While victimization reflected student perspectives, perpetration was measured via teachers' perspectives in the ECLS-K. Although teachers observe student behavior for an extended period of time each weekday, they have been found to report significantly less involvement in peer victimization than children (Stockdale, Hangaduambo, Duys, Larson, & Sarvela, 2002). Due to lower incidence of bullying in the primary grades, teachers may not observe bullying behavior frequently in the classroom (Glew et al., 2005). Further, teachers may view more aggressive behavior as peer victimization (e.g., pushing, hitting, and kicking), while less observable

behaviors (e.g., social exclusion) may not be viewed as peer victimization (Waasdorp, Pas, O'Brennan, & Bradshaw, 2011).

Another difficulty with assessing aggressive behavior is a lack of understanding and differing definitions of aggression among teachers and parents. While some teachers may view all aggressive acts as peer victimization, others may more closely (and correctly) adhere to the definition of bullying behavior proposed by Olweus (1993) in which bullying behavior has to be repeated over time and take place between students with an imbalance of power. Future research could provide teachers with clear definitions and examples of bullying prior to completing scales to assess these behaviors. Additionally, researchers could use other methods to assess aggressive behavior, like direct observation or peer nomination to ensure they are assessing bullying behaviors that teachers may not observe (i.e., on the playground, in the hallway, etc.; Crothers & Levinson, 2004). However, these methods tend to be time consuming and would require more resources to collect.

Similar to the potential lack of teacher understanding of aggressive behavior, students may also have difficulty understanding the definitions of perpetration and victimization. In previous research, children have reported feeling bullied even when both their peers and teachers had not rated them highly on victimization (Crothers & Levinson, 2004). This high self-rating of victimization could be due to a lack of understanding of aggression or a distorted view of social desirability. Additionally, Craig (1998) suggested that people tend to under-report victimization to avoid social stigmatization and recommended that a measure of social desirability may help determine if students are reporting victimization behavior accurately. As mentioned previously, peer nominations could be a way to check students' self-ratings of victimization behavior and

identify other students who may be reluctant to report either victimization or perpetration (Crothers & Levinson, 2004).

Another limitation of the current study was that a portion of the data were missing due to the longitudinal nature of the study. While the missing data were believed to be due to random attrition and chance, participants with certain characteristics may have been more likely to withdraw from the study than others. Finally, due to the low incidence nature of the behavior during the primary grades of both perpetration and victimization, the outcome variables had to be recoded and analyzed as binary variables. As such, the threshold for both perpetration and victimization may have been too low. Children who are involved in peer victimization more frequently or for longer periods of time may also have stronger predictors of the behavior.

Additionally, due to the dichotomous nature of the outcome variables, logistic regression needed to be used. While researchers like Durlak (2009) indicate that odds ratios can be used as effect sizes, Mood (2010) suggested that ORs cannot be as straightforwardly interpreted as effect sizes using standard regression. As such, future studies may want to utilize a continuous measure of peer victimization, as the effect sizes within these models are able to be generalized to other populations (Mood, 2010).

Potential Implications for Research and Practice

The current study found that externalizing behavior was the strongest predictor of both victimization and perpetration throughout the grades. As such, schools may want to consider including a screening for externalizing behaviors when students are in the primary grades. Additionally, internalizing behavior and social skills were statistically significant for victimization. These behavioral variables are often common targets of screening as students enter kindergarten, or as they progress throughout school (Owens et al., 2015). Schools could

use such screening data to inform interventions with small groups or individual students. Schools could also focus on promoting positive social skills or lower levels of problem behaviors school-wide through implementing program focused on social-emotional learning (Weissberg, 2019).

Additionally, some predictors emerged as statistically significant as the predictors were assessed closer to the outcome variable of interest. While many schools implement a screening process during kindergarten (Severson et al., 2006), results from the current study indicate that schools may potentially want to consider adding screening to each primary grade. Results from the current study indicated that a greater number of statistically significant predictors emerged (with stronger overall relationships) when the students were in third grades (i.e., the year when being a victim and perpetrator was measured). If schools are not able to screen students at the beginning of each year due to limited resources, schools may want to consider waiting until the intermediate grades as the screening during that period may be most cost effective. Additional studies should be conducted to determine the most appropriate time for screening for peer victimization, as well as what set of variables should be assessed during the screening.

Directions for Future Research

Given the aforementioned limitations, there are several directions for future research. First, researchers can use more comprehensive scales to ensure they are adequately assessing all aspects of bullying (i.e. Olweus Bullying Scale). While the ECLS-K included questions about aggression, it did not ask students the length of time or how often the behaviors occurred. Additionally, the scale used by the ECLS-K did not assess power imbalance as part of the questions. Both of these factors are key parts of the definition of bullying behavior (Olweus, 1993), and including additional items regarding the amount of time and the power imbalance

would allow future researchers to adhere to the commonly accepted definition of bullying behavior.

Additionally, researchers could differentiate between direct (e.g., pushing or hitting) and indirect (e.g., social isolation or rumor spreading) forms of aggression, which could lead to the identification of additional predictors of aggressive behavior in the future and have a potential implication on intervention approaches used by schools. They may also include questions about cyber bullying, as the incidence of cyber bullying has increased with student's use of social media and technology (Kowalski & Limber, 2013). Future research can also employ multiple methods to measure aggressive behavior such as peer nominations, interviews with students and teachers, observations, and rating scales.

In addition, researchers can focus on specific behaviors that could serve as targets for early screening and intervention. For example, internalizing and externalizing behaviors are often targeted for intervention in the primary grades. Future studies, however, can focus on specific types of behaviors within these broad constructs, such as aggression or hyperactivity for externalizing behaviors, or anxiety or depression for internalizing variables. Focusing on a narrow set of predictors can allow researchers to narrow down specific behaviors that may be more likely associated with peer victimization.

Additionally, future research should attempt to inform when it is best to screen for identified behaviors. Results from the current study suggest that screening students in closer proximity to the behavior of interest may be more accurate given the increased predictive power. For example, the odds ratios for a number of variables, including student-teacher relationships and internalizing behavior, became statistically significant predictors during third grade. The odds

ratios also indicated that there was a stronger relationship to the outcome variables of victimization and perpetration.

While there is research to suggest that bullying does occur in the primary grades (e.g., Limber, Olweus, & Luxenberg, 2013, Glew et al., 2005), most research to date has found that bullying peaks in middle school and declines into high school (DeVoe & Bauer, 2011). As such, an important future direction is for researchers to assess predictors of perpetration and victimization in third, fourth, and fifth grades and how those relate with bullying behavior in middle school.

Conclusions

Prior studies (e.g., DeVoe & Kaffenberger, 2005; Hawker & Boulton, 2000) have shown that involvement in aggression can have lasting negative consequences into adulthood. Students who participate in aggression have been found to experience lower levels of academic achievement, increases in risk for internalizing and externalizing disorders, and higher levels of risk-taking behavior (DeVoe & Kaffenberger, 2005; Hawker & Boulton, 2000). Researchers (e.g., Alvarez-Garcia et al., 2015; Azeredo et al., 2015) have identified a number of predictors of perpetration and victimization throughout primary and secondary school. Students who exhibit higher levels of internalizing and externalizing behavior and lower levels of social skills were more likely to engage in perpetration and victimization in later years. Contextual variables, like school climate and student teacher relationships, also have an impact on students' involvement in perpetration and victimization (Alvarez-Garcia et al., 2015; Azeredo et al., 2015).

Results from the current study indicated that externalizing behavior was the strongest and most consistent predictor of perpetration and victimization across grade levels. Internalizing behaviors and social skills were also consistently statistically significant for perpetration

throughout first through third grade. Further, student-teacher conflict emerged as a statistically significant predictor across multiple grade levels for both perpetration and victimization. Other predictors were statistically significant (e.g., school climate, SES) for only some grade levels.

Previous research has found other statistically and practically significant predictors of both victimization and perpetration, including school climate, social skills, and student-teacher relationships (e.g., Fox & Boulton, 2005). However, these studies tended to be conducted with older grades, with smaller samples, or with different measures of the constructs. As measures were assessed closer to the outcome variable of interest, perpetration and victimization, they tended to be both more practically and statistically significant. These results indicate that prediction of involvement in peer victimization may need to be assessed close to when aggressive behaviors are most likely to emerge in the elementary grades.

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Footnotes

1. To a large extent, measures used in the first ECLS-K (1998-1999) study were also used in the ECLS-K (2011-2012). Researchers indicated what variables were changed in the kindergarten manual of the ECLS-K (2011-2012; Tourangeau et al., 2012). As such, information was taken from the manual for both the ECLS-K (1998-1999; Tourangeau et al., 2004) and the ECLS-K (2011-2012; Tourangeau et al., 2017).
2. Due to some violations of assumptions, bully perpetration and victimization were each recoded into 4- and 3-point Likert scales. Both the 4-point scale and the 3-point scale did not result in a significant reduction of non-normality. As such, the 4-point scale and the 3-point scale were not retained for analysis.
3. The original predictor variables were subjected to log transformation to see if this would improve normality of the data distribution. While the transformed data improved some assumptions, the data did not evidence a significant difference from the original data. The non-transformed data is closest to the original data, which allows the results to be generalized to the target population. The non-transformed data also allows for statistics that are simpler to interpret for practical significance. As such, the non-transformed variables were retained for analysis.

Appendix A

ECLS-K Victimization Questions (completed by students)

1. During this school year, how often have other students teased you, made fun of you, or called you names?
2. During this school year, how often have other students told lies or untrue stories about you?
3. During this school year, how often have other students pushed, shoved, slapped, hit, or kicked you?
4. During this school year, how often have other students left you out from playing with them on purpose?

Appendix B

ECLS-K Perpetration Questions (completed by teachers)

1. During this school year, has this student ever teased, made fun of, or called other students names?
2. During this school year, has this student ever pushed, shoved, slapped, hit, or kicked other students?
3. During this school year, has this student ever intentionally excluded or left other students out from playing with them?
4. During this school year, has this student ever told lies or untrue stories about other students?

Appendix C

Table 5

Correlations Between Predictors and Outcomes (Kindergarten)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. BMI														
2. Sex	-.03*	-												
3. SES	-.15*	.00	-											
4. Race	.10*	.06	-.31*	-										
5. Control	-.05*	.18*	.12*	-.07*	-									
6. Interpersonal	-.03*	.20*	.11*	-.06*	.81*	-								
7. Externalizing	.05*	-.21*	-.11*	.03*	-.74*	-.63*	-							
8. Internalizing	.03*	-.04*	-.09*	.00	-.29*	-.29*	.30*	-						
9. Closeness	-.01	.17*	.11*	-.10*	.35*	.35*	-.22*	-.24*	-					
10. Conflict	.04	-.18*	-.10*	.04*	-.70*	-.70*	.75*	.35*	-.37*	-				
11. School Climate	-.04*	.02	.16*	-.12*	.13*	.12*	-.10*	-.09*	.12*	-.11*	-			
12. Discipline	-.01	-.01	-.01	.01	.00	-.00	.00	.00	.01	.01	.01	-		
13.Relationships	-.02	.17*	.11*	-.11*	.62*	.66*	-.60*	-.35*	.83*	-.87*	.11*	.01	-	
14. Perpetration	.04*	-.15*	-.16*	.07*	-.36*	-.30*	.44*	.08*	-.08*	.36*	-.05*	.01	-.23*	-
15.Victimization	-.02	-.01	-.00	.01	.01	.00	-.01	.01	.01	-.00	.01	.50*	.00	.15*

Appendix D

Table 6

Correlations Between Predictors and Outcomes (First Grade)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. BMI	-													
2. Sex	-.01	-												
3. SES	-.17*	.00	-											
4. Race	.10*	.02	-.33*	-										
5. Control	-.07*	.18*	.15*	-.06*	-									
6. Interpersonal	-.06*	.21*	.15*	-.06*	.80*	-								
7. Externalizing	.05*	-.22*	-.11*	.01	-.72*	-.62*	-							
8. Internalizing	.04*	-.05*	-.10*	-.01	-.31*	-.35*	.30*	-						
9. Closeness	-.04*	.18*	.13*	-.12*	.33*	.49*	-.18*	-.20*	-					
10. Conflict	.05*	-.20*	-.12*	.03*	-.70*	-.65*	.75*	.35*	-.34*	-				
11. School Climate	-.06*	.00	.20*	-.16*	.13*	.15*	-.09*	-.08*	.18*	-.13*	-			
12. Discipline	-.04*	.04*	.05*	-.03*	.06*	.04*	-.07*	.01	-.01	-.06*	.03*	-		
13. Relationships	-.07*	.23*	.17*	-.12*	.63*	.68*	-.59*	-.32*	.83*	-.86*	.19*	.03	-	
14.Perpetration	-.01	.01	-.00	.00	-.00	.01*	.01	-.00	-.01	.00	-.01	.01	-.01	-
15. Victimization	.04*	-.05	-.11*	.02	-.21*	-.17*	.25*	.08*	-.02*	.20*	-.05*	-.05*	-.14*	.15*

Appendix E

Table 7

Correlations Between Predictors and Outcomes (Second Grade)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. BMI	-													
2. Sex	-.01	-												
3. SES	-.09*	.00	-											
4. Race	.10*	.02	-.21*	-										
5. Control	-.06*	.19*	.09*	-.05*	-									
6. Interpersonal	-.05*	.22*	.11*	-.06*	.81*	-								
7. Externalizing	.04*	-.22*	-.07*	.01	-.73*	-.63*	-							
8. Internalizing	.06*	-.06*	-.07*	-.02*	-.36*	-.38*	.33*	-						
9. Closeness	-.03*	.21*	.09*	-.13*	.34*	.48*	-.19*	-.20*	-					
10. Conflict	.05*	-.21*	-.09*	.05*	-.71*	-.65*	.74	.38*	-.35*	-				
11. School Climate	-.04*	.02	.10*	-.12*	.15*	.14*	-.10*	-.09*	.16*	-.13*	-			
12. Discipline	-.04*	.04*	.02	-.03*	.06*	.05*	-.07*	.01	.01	-.06*	.02	-		
13. Relationships	-.06*	.24*	.01*	-.12*	.63*	.68*	-.54*	-.36*	.84*	-.83*	.19*	.05*	-	
14. Perpetration	-.01	.01	-.01	.00	-.01	-.01	.01	-.00	-.02	.02	-.00	.01	.01	-
15. Victimization	.04*	-.05*	-.06*	.02	-.24	-.21	.27*	.12*	-.02	.22*	-.05*	-.05*	-.11*	.15*

Appendix F

Table 8

Correlations Between Predictors and Outcomes (Third Grade)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. BMI	-													
2. Sex	-.01	-												
3. SES	-.17*	.00	-											
4. Race	.10*	.02	-.38*	-										
5. Control	-.06*	.20*	.17*	-.05*	-									
6. Interpersonal	-.06*	.24*	.17*	-.05*	.80*	-								
7. Externalizing	.04*	-.24*	-.12*	-02	-.73*	-.62*	-							
8. Internalizing	.06*	.04*	-.13*	-.01	-.35*	-.37*	.32*	-						
9. Closeness	-.03*	.18*	.15*	-.12*	.32*	.49*	-.15*	-.17*	-					
10. Conflict	.05*	-.22*	-.15*	.04*	-.71*	-.65*	.74*	.38*	-.33*	-				
11. School Climate	-.01	-.00	.01	-.00	.00	.02*	.02*	-.00	.04*	.01	-			
12. Discipline	-.04*	.04*	.04*	-.03*	-.05*	.04*	-.08*	-.01	.00	-.06*	.00	-		
13.Relationships	-.01	.01	.01	-.12*	.64*	.66*	-.58*	-.33*	.83*	-.84*	.19*	.03	-	
14.Perpetration	.05*	-.12*	-.14*	.04*	-.57*	-.54*	.60*	.22*	-.18*	.57*	.03	-.05*	.01	-
15.Victimization	.07*	-.04*	-.14*	.04*	-.19*	-.15*	.20*	.11*	-.00	.15*	.02*	-.06*	-.12	.15*

Vitae

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Education

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