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Risk and Resiliency Factors at School Entry: Relations to Academic and Behavioral Outcomes in Early Adolescence

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Risk and Resiliency Factors at School Entry:
Relations to Academic and Behavioral Outcomes in Early Adolescence

by

Krystle Kuzia Preece

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in School Psychology
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externalizing and internalizing problems, prosocial behavior

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Dedication

I would like to dedicate my dissertation to my mother, Lorna Kuzia, and father, Walter Kuzia, for their endless love and support. Thank you for instilling in me the values of hard work and persistence. Mom, you inspired me to go into the field of education to advocate and serve students with passion and dedication. Thank you mom and dad for always supporting my dreams.

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Abstract

The purpose of this study was to examine how early academic and behavioral variables in kindergarten (i.e., academic performance, first time kindergarten status, early school-related emotional adaptation, prosocial behavior, externalizing behaviors, and internalizing behaviors) were related to academic and behavioral outcomes in eighth grade (i.e., academic performance, retention, suspension, externalizing behaviors, internalizing behaviors, and having an educational/mental health diagnosis). Archival data from the Early Childhood Longitudinal Study—Kindergarten Cohort (ECLS-K) database that included approximately 5,700 participants from across the U.S., were examined to answer three research questions: (1) How are early academic and behavioral variables related to each other among youth in kindergarten? (2) How are early academic and behavioral variables measured in kindergarten related to academic and behavioral outcomes in eighth grade? (3) To what extent do demographic variables moderate the relations between early academic and behavioral variables and eighth grade outcomes? Results showed that early academic and behavioral variables were relatively independent of each other with two primary exceptions. Teacher perceptions of academic skills in math and reading showed a strong positive relation to each other, and teacher-reported externalizing behavior and prosocial behavior showed a moderate negative relation. In terms of eighth grade outcomes, math skills in kindergarten were predictive of eighth grade outcomes across both the academic and behavioral domains (with the exception of suspension). Reading skills in kindergarten were predictive of eighth grade reading outcomes but none of the behavioral outcomes measured. Additionally, first-time kindergarten status was positively related to reading and math scores in

eighth grade and negatively related to having an educational/mental health diagnosis and internalizing behavior problems in eighth grade. With regard to kindergarten behavioral risk factors, externalizing behavior seemed to be the most salient predictor of eighth grade outcomes, showing a negative relationship with eighth grade reading and a positive relationship with suspension, internalizing and externalizing behaviors, and the presence of an educational or mental health diagnosis. Internalizing behaviors in kindergarten did not show the same predictive power as externalizing factors, although they were related to some eighth grade behavioral outcomes. With regard to kindergarten behavioral protective factors, early school-related adjustment was positively related to eighth grade math achievement. It was also negatively related to experiencing retention by eighth grade and eighth grade internalizing and externalizing symptoms. In terms of demographic moderators of relations between early academic and behavioral variables and eighth grade outcomes, gender was a moderator of the relation between kindergarten externalizing behavior and experiencing retention by eighth grade. Females with high levels of externalizing behavior were more likely than males with high levels of externalizing behavior to experience retention. Implications of the study for school-based practice are discussed.

Chapter 1: Introduction

It is widely recognized that children's school adjustment during the early years of their educational careers is related to their school trajectories over time (Alexander, Entwisle, & Horsey, 1997). Children who experience difficulty adjusting to the behavioral expectations of the typical kindergarten classroom are at-risk for continued school difficulties (McClelland, Acock, & Morrison, 2006). The purpose of this study was to investigate which academic and behavioral variables measured in kindergarten are most closely related to academic and behavioral adjustment in eighth grade. Being able to target and understand which particular factors put children at the greatest risk for later maladaptive school outcomes will allow educators to intervene with these children early in their educational careers in order to potentially alter their trajectories.

Goals of the Study

The primary goal of this study was to discover which early academic and behavioral risk factors are most likely to lead to later academic or behavioral maladjustment and which early academic and behavioral resiliency factors may buffer the impact of these early risk factors. Determining the most salient risk and resiliency variables can help to inform the development of behavioral screeners, which allow educators to identify children who need greater levels of behavioral support than are typically offered universally. These efforts are particularly important in schools using Multi-Tiered Systems of Support (MTSS), which promote early identification and remediation efforts using evidence-based research for academic and behavioral concerns

(Stockslager, Castillo, Hines, Batsche, & Curtis, 2013). Given that this was an exploratory study, a wide variety of kindergarten factors were selected. These included: (a) academic performance, (b) early school-related emotional adaptation, (c) prosocial behavior, (d) externalizing behavior problems, (e) internalizing behavior problems, and (f) first time kindergarten status. These variables were based on previous literature's findings (e.g., Alexander, Entwisle, & Kabbani, 2001; Alexander et al., 1997; Christenson, Thurlow, Hickman, & Garvey, 2006; Elliot et al., 2004; Miles & Stipek, 2006; Rapport, Denney, Chung, & Hustace, 2001).

There has been considerable study of each of the variables listed above in isolation. However, few studies have examined these variables simultaneously among youth, especially in kindergarten. Thus, a secondary purpose of this study was to ascertain the degree to which these variables are correlated with each other among children in kindergarten to address the issue of multicollinearity of variables. Rock and colleagues (2002) found that there was a moderate negative correlation between teachers' ratings of kindergarten students' prosocial behaviors and externalizing behaviors. Similarly, Wentzel (1993) found significant, positive relations among achievement (GPA and standardized test scores) and prosocial behavior. Within Wentzel's (1993) study, there was a significant negative relation between achievement in terms of GPA and antisocial behavior. The relation between standardized test scores and antisocial behavior, however, was not found to be significant. Importantly, this study's sample included older youth (i.e., sixth and seventh grade students), and prosocial and antisocial behavior were reported by peer nominations. The current study examined a wide variety of variables to assess the degree of relationship between early risk and resiliency factors in kindergarten.

The final aim of this study was to examine whether certain groups of kindergarten students with different child and family characteristics were more at-risk or resilient in terms of their early adolescent outcomes. More specifically, the study examined whether relations vary among early academic and behavioral factors and early adolescent outcomes (i.e., academic and behavioral) based on demographics (i.e., gender, family socioeconomic status composite). These analyses shed light on whether there are certain groups of children who begin kindergarten at a disadvantage compared to other children. Some systematic differences were found in the current study between groups; therefore, it is important for educators to attempt to level the playing field for these youth.

Overarching Frameworks

Three major frameworks guided the current study: 1) developmental psychopathology, 2) risk and resilience, and 3) ecological systems theory. Each of these frameworks is helpful in understanding children's development within a broader context.

Developmental psychopathology. Developmental psychopathology is an approach to understanding mental health disorders that recognizes there are multiple factors and pathways involved in the development and trajectory of these disorders (Sroufe & Rutter, 1984). Central tenets within developmental psychopathology include the concepts of continuity and discontinuity, as well as multifinality and equifinality. With regard to continuity and discontinuity, if a child exhibits problems early in development, he or she may or may not continue to demonstrate such problems later in life. For example, a child who has difficulty with attention in early elementary school may continue to struggle with attention deficits into middle and high school (demonstrating continuity). On the other hand, the child with early attention deficits may

improve in this area over time or may begin to experience feelings of inner restlessness as an adolescent, although the obvious hyperactivity from childhood is no longer present (demonstrating discontinuity; e.g., Miller et al., 2008; Robins, 1966).

Related to continuity and discontinuity are the concepts of multifinality and equifinality. The concept of multifinality states that although individuals may experience similar risk factors, they may have different developmental trajectories over time (Cicchetti & Rogosch, 1996; von Bertalanffy, 1968). Conversely, equifinality is seen in situations where individuals possess different risk factors but have the same outcome (e.g., Cicchetti & Rogosh, 1996). For example, two early adolescents may both have conduct problems (i.e., the same outcome) although their pathways to the development of these problems differed. One youth may have been diagnosed with a conduct problem in kindergarten while the other had no diagnosis during early childhood but began to demonstrate conduct problems in early adolescence. Overall, the developmental psychopathology approach recognizes the complexity of the development and progression of mental health disorders and emphasizes variability in outcomes across individuals. It also emphasizes the importance of understanding risk and resiliency factors in these processes.

Risk and resilience. Although developmental psychopathology features an emphasis on risk and resilience as one part of the overall approach, risk and resilience theory, as discussed by Garmezy (1974), is a unique theoretical framework that was included in this study as well. The term resiliency describes an individual or population with successful adaptation in spite of significant challenges (Masten et al., 1999). Risk and resilience theory posits that an accumulation of risk factors is associated with

negative outcomes over time (Blackman, Ostrander, & Herman, 2005; Friedman & Chase-Lansdale, 2002; Sameroff & Rosenblum, 2006). For example, a child who has early behavioral difficulties, lives in an economically impoverished neighborhood, attends a school with low student achievement, and is being raised by a mother who is clinically depressed is at much greater risk for maladaptive outcomes over time than a child who has early behavioral difficulties but many environmental protective factors. The theory also recognizes that moderating factors can exacerbate risk or engender protection for certain individuals or populations (Baron & Kenny, 1986; Kirby & Fraser, 1997). For example, if the child with a preponderance of risk factors described above also demonstrates strong social skills and/or is a talented athlete, the outcomes for that child are likely to be better than if those assets were not present.

Ecological theory of human development. Bronfenbrenner's ecological theory of human development (1979) is also incorporated as a complementary framework. This ecological theory of human development highlights the importance of the context in which children develop. This context includes multiple subsystems, including the macrosystem (the larger cultural context in which the child lives), the exosystem (practices within the community that impact children, like parental leave laws); multiple microsystems (like home and school), the mesosystem (interactions between microsystems), and the chronosystem (transitions over the life course and sociohistorical events). Overall, Bronfenbrenner's theory is valuable in understanding the larger context that impacts how children develop and how multiple systems are involved and interwoven in producing a given child's individual developmental context.

Although not directly part of Bronfenbrenner's theory, it is important to note that some of the variables within these contexts are alterable while others are unalterable (Christenson, 2008). Alterable variables are those that are more easily changed; unalterable variables are difficult to change. It is important to make these distinctions when one is contemplating how to proceed with prevention and intervention efforts. Although unalterable variables or demographic characteristics are not easily changed, it is important to study them because they allow us to identify particular groups of children who are at greater risk for maladaptive outcomes. For example, low socioeconomic status is associated with academic and behavioral maladjustment (Farrington, 1991; The National Center for Education Statistics, 2008; Office of Juvenile Justice and Delinquency Prevention, 1995). On the other hand, studying alterable variables like prosocial behavior, which can be taught to children, allows researchers to see where they can potentially intervene with a child to support adaptive changes. The current study included both unalterable variables (to identify groups of children who are at risk) and alterable variables (to identify which areas to target in prevention and intervention efforts).

Research Questions

Archival data from a large research study, the Early Childhood Longitudinal Study-Kindergarten (ECLS-K), were analyzed across time (i.e., kindergarten and eighth grade). The National Center for Education Statistics (NCES) originally conducted the larger study, which was unique as it was the first of its kind to follow a 1998-1999 kindergarten cohort that was initially nationally representative through spring 2007 when most students were in eighth grade. NCES's primary objective was to examine early

school experiences in relation to long-term outcomes (i.e., into middle school). Data were collected from various sources: direct child assessment, parent interview, teacher survey, school administrator surveys, and school data. The database enabled researchers an opportunity to analyze data with consideration of individual, family, school, and community characteristics. The current study examined the following questions:

1. How are early *academic* (Academic Rating Scale, early direct reading test, and early direct math test) and *behavioral* variables (i.e., early school-related emotional adaptation, prosocial behaviors, externalizing behaviors, and internalizing behaviors) related to:

(a) early *behavioral* variables in a sample of youth in kindergarten?

(b) early *academic* variables (direct testing in reading and math; teachers' ratings of reading and math)?

2. How are early *academic* (e.g., Academic Rating Scale, early direct reading test, and early math standardized test), *behavioral* (i.e., early school-related emotional adaptation, prosocial behavior, externalizing behaviors, and internalizing behaviors), and demographic variables related to:

(a) academic outcomes in eighth grade (direct child testing in reading and math grades; and retention as of 2006-2007 school year)?

(b) school discipline outcomes across time (presence or absence of in school or out of school suspensions from kindergarten-eighth grade)?

(c) eighth grade mental health/educational outcomes (i.e., internalizing and externalizing symptomology and diagnoses)?

3) To what extent, if any, do demographic variables moderate the relations between early behavioral variables and eighth grade outcomes?

Conceptual Grouping of Predictors

Due to the complexity of the study, which included a multitude of variables, conceptual predictor blocks organized the multiple regression analyses. Multiple regression and logistic regression analyses were used as part of this correlational design. These blocks were as follows: (1) demographics, (2) early academic factors, (3) early behavioral factors (resiliency), and (4) early behavioral factors (risk). Academic and behavioral adjustment were both part of the overall early adolescent adjustment outcomes.

Definition of Key Terms

Predictor block 1 and 2: Demographics and academics. Predictor block 1 consisted of child/family characteristics, and predictor block 2 consisted of early academic factors. These variables were entered to control for main behavioral effects, as well as be used as potential moderators. These variables are important as they help identify potential systematic differences among groups (e.g., gender differences in mean levels of internalizing behavior).

Child/family characteristics. The current study accounted for the specified socio-demographic variables of gender, race, and family socioeconomic status. Several studies have found gender to be a significant predictor of behavioral outcomes (e.g., office disciplinary referrals and/or suspension). Specifically, Coutinho and Oswald (2005) cite gender disproportionality, finding that across the different states drawn from 88,650 schools within the United States during the 2000 to 2001 school year that the male-to-female ratio for special education high-incidence disability status ranged between 1.5:1 to 3.5:1. Furthermore, ethnic/racial differences have been found (Brooks, Schiraldi, &

Ziedenberg, 1999; Tenenbaum & Ruck, 2007; Wright, Morgan, Coyne, Beaver, & Barnes, 2014; U.S. Commission of Civil Rights, 2009). Tenenbaum and Ruck's (2007) meta-analysis of 15 studies found that African American/Black, as well as Hispanic students, were more likely to have more office disciplinary referrals than their Caucasian counterparts. However, it should be noted that some studies (e.g., Krezmien, Leone, & Achilles, 2006) found that Hispanic students were less likely to be suspended than Caucasian students. Krezmien and colleagues (2006) reported that "the proximity of the 95% confidence interval for a number of years (i.e., 5 of the 9 years examined) limits the strength of this finding" (p. 220).

Early academic factors. This study also accounted for several early academic factors measured in kindergarten. Early academic factors included direct assessments in reading and math (measured in the fall of kindergarten), and teachers' ratings of student performance in reading and math (measured in the spring of kindergarten), whether it was student's first time in kindergarten or not (i.e., not retained in kindergarten).

Predictor block 2: Early behavioral resiliency factors. This study included two early behavioral resiliency factors measured in kindergarten: early school-related emotional adaptation and prosocial behavior.

Early school-related emotional adaptation. *Early school-related emotional adaptation* was defined in this study as children's emotional adaptation, including positive statements about teacher and school, lack of reluctance to attend school, and adjustment to their school environment as reported by their parents.

Prosocial behavior. *Prosocial behavior* was defined in this study as how an individual acts on a voluntary basis towards or in response to the benefit of others

(Eisenberg, Fabes, & Spinrad, 2006). This variable was measured using the Social Rating Scale (SRS; Gresham & Elliot, 1990). Both parent and teacher ratings were reported.

Predictor block 4: Early behavioral risk factors. This study also included two early behavioral risk factors measured in kindergarten: externalizing problems and internalizing problems.

Externalizing problems. *Externalizing problems* were defined in this study as “inappropriate behaviors involving verbal or physical aggression toward others, poor control of temper, and arguing” (Gresham & Elliot, 1990, p.5) as well as Attention Deficit/Hyperactivity symptoms. The current study also used the SRS from parent and teacher ratings to evaluate these concerns (Gresham & Elliot, 1990).

Internalizing problems. Finally, *internalizing problems* were defined as behaviors that suggest “anxiety, sadness, loneliness, and poor self-esteem” (Gresham & Elliot, 1990, p.4). Within the current study, both parent and teacher ratings were reported.

Outcomes: Early adolescent adjustment. The outcome variables in this study included measures of both academic and behavioral adjustment.

Academic performance. Academic performance was measured through direct assessments in reading and math in eighth grade, parent-reported grades in classes in eighth grade, and retention as of 2006-2007.

Behavioral adjustment. Behavioral adjustment was measured through cumulative parent-reported suspensions from kindergarten through eighth grade, parent-reported presence of mental health/educational diagnoses (e.g., ADHD; learning disability) in eighth grade, and parent-reported internalizing and externalizing symptoms when most students were in eighth grade.

Contributions to the Literature

This study expands the literature in several ways. While previous studies have used the ECLS-K database, these studies have primarily examined the relations between early school factors and late elementary academic factors. In contrast, only a few, recent studies have begun to analyze this relation from early schooling into middle school (e.g., Bodovski & Youn, 2012). A major contribution of this study is in the examination of whether behavioral and academic variables in kindergarten are unique contributors to long-term student outcomes in eighth grade (i.e., behaviorally and academically). The study featured a national sample that should enhance generalizability of the findings.

Chapter 2: Review of the Literature

The purpose of this chapter is to summarize the extant literature about the relations between kindergarten variables and later school outcomes. The chapter begins with a review of the literature related to the importance of school achievement within the context of children's lives. Subsequently, what is known about how early school academic factors (i.e., in the early elementary years) are related to later school adjustment (i.e., in secondary school) is reviewed. Much of the preexisting literature in this area has examined academic achievement (as both a predictor and an outcome). Consequently, the current study focused on how early behavioral variables impact later school success, including behavioral outcomes. These early behavioral variables included early school-related emotional adjustment, prosocial behavior, externalizing behaviors (including attention), and internalizing behaviors. This chapter will review what is known about each of these variables in association with future school-related outcomes. There also will be a brief review of the literature on the interaction between academic performance and behavior.

The literature on children's development has repeatedly shown that a consideration of context is important in understanding outcomes (e.g., Farrington, 1991; The National Center for Education Statistics, 2008; Office of Juvenile Justice and Delinquency Prevention, 1995). As such, this chapter also will highlight some of the most important demographic variables (e.g., the child's gender and the family's socioeconomic status) to consider in studying children's development and demographic variables'

relations with predictors and outcomes included in the current study. Additionally, the chapter will provide the rationale for the focus of the study on secondary school outcomes (i.e., how these outcomes relate to later success in life), and it also will include a brief overview of kindergarten screening given the focus of the current study on school entry and behavior. The chapter concludes with a summary of the literature in this area and an overview of the current study. Appendix A features a summary table that provides an overview of several key articles cited in this chapter, with several utilizing the sample from the ECLS-K study.

The Importance of School Achievement in the Context of Children's Lives

It is widely recognized that it is important to identify school-related problems early in children's school careers (Gresham, 2005; Moffit, 1993). Early school success has implications for students' later school performance as well on their long-term outcomes as adults. Public high school data in 2001 revealed that approximately one in three students leaves school prior to graduation (Swanson, 2004). Child characteristics (e.g., academic skills and mental health) and familial variables (e.g., socioeconomic status) are risk factors for school failure (Office of Juvenile Justice and Delinquency Prevention, 1995). Research dating back to the 1940's suggests an inverse relation between academic achievement and delinquency, such that low levels of achievement are associated with high rates of delinquency (Glueck & Glueck, 1940; Meltzer, Levine, Karniski, Palfrey, & Clarke, 1984). Moreover, individuals with lower academic performance are more likely than those with higher academic performance to drop out of school, as well as face incarceration and prison recidivism (Archwamety & Katsiyannis, 2000; Malmgren & Leone, 2000; Tsai & Scomegna, 2012; Western & Petit, 2010).

There also are long-term implications for academic failure in society. The National Center for Education Statistics (2008) recently reported that among 16-24 year old high school dropouts, significantly more students came from low socioeconomic (SES) homes (16.7%) compared to high SES homes (3.2%). Unfortunately, many dropouts remain or become impoverished, with national poverty rates three times higher among individuals who do not possess a high school degree (U.S. Department of Labor, 1997). Dropouts also generally bring in lower tax revenue and require more social services (e.g., health care and/or incarceration expenses; U.S. Department of Health and Human Services, 2000) than their peers who graduate from high school. These types of outcomes argue for the need to examine both early risk and protective factors in order to promote school success for all students.

In the U.S., federal policies have been instituted to make schools accountable for all student outcomes. The No Child Left Behind Act of 2001 (NCLB, 2002) and the Individuals with Disabilities Education Improvement Act of 2004 (IDEA) both emphasize data-based decision-making and evidence-based practices to improve student outcomes. NCLB focuses on school-wide achievement whereas IDEA targets individual students, particularly those with disabilities. Despite these initiatives, large achievement gaps still exist between vulnerable groups (e.g., low SES; National Center for Education Statistics, 2008) and average students. Recent advocacy efforts through the federal Academic, Social, Emotional, and Learning Act of 2011 highlight the need to identify youth at risk and provide comprehensive services. These policies and advocacy efforts emphasize the need to bridge the gap between research and practice in order to identify

early risk and resiliency factors that are central to predicting future academic and behavioral adjustment trajectories.

Early Learning Variables Associated with Later School Outcomes

Due to the centrality of academic success for American youth with regard to long-term outcomes, researchers have begun to systematically identify early risk factors that may serve as barriers to school success (e.g., Allensworth & Easton, 2005; 2007; Hickman, Bartholomew, Mathwig, & Heinrich, 2008). The Early Warning System (EWS; Hickman et al., 2008) identifies risk factors for school failure in order to appropriately tailor interventions for specific schools or districts through data-based decision-making. Research in this area has focused largely on high school level factors, with an emphasis on ninth grade as a pivotal year in terms of later high school academic performance, attendance, and demographics. However, future indicators of school success can be found not only in secondary school (Reschly & Christenson, 2006; Jerald, 2006; Neild & Balfanz, 2006) but also as early as the foundational years of children's school careers (Alexander, Entwisle, & Horsey, 1997; Barrington & Hendricks, 1989; Hickman et al., 2008; Lehr, Sinclair, & Christenson, 2004).

Predictors of school success. Different sources of student progress, such as screeners and school archival records, can provide data on various risk and protective factors. In kindergarten, screeners are frequently used to evaluate academic and behavioral performance (Gredler, 2004). These screeners are important because adjustment to kindergarten can be a vulnerable time for young children. Rimm-Kaufman and Pianta (2000) described kindergarten as a period during which young children interact with the school environment to create a new system. Interactions within this

system mark the beginning of children's school careers and their school identities (Alexander et al., 1997). As such, they can be influential in children's future school trajectories (Pianta & Walsh, 1996). Consequently, this transition appears to be an important time period to explore and provide insight on student trajectories. School archival records are a source of data that can provide insight into typical Early Warning System predictors, including academic performance (Alexander et al., 2001; Alexander et al., 1997).

Overview of early academic factors related to later school outcomes. The following section will highlight early academic factors, featuring several indices of academic performance. A brief review of academic performance will be presented (La Paro & Pianta, 2000). Academic performance is generally measured using grades and scores on standardized assessments (Heppen & Therriault, 2008).

Early academic performance. Previous studies suggest that early academic performance is a salient predictor and outcome within a child's development. There are a number of research studies that suggest that academic deficits should be rectified by third grade or a negative academic trajectory is likely to occur (Christenson et al., 2006; Lehr et al., 2004). A limitation of many of these studies, however, is that they use a short-term longitudinal approach. For example, a meta-analysis of 70 longitudinal, quantitative studies conducted between 1985 and 1998 examined the relation between preschoolers' or kindergarteners' academic/cognitive skills and their school outcomes as first or second grade students (La Paro & Pianta, 2000). Within this analysis, preschoolers' and kindergartners' academic and cognitive scores had a strong, positive effect ($r = .51$) on their first or second grade academic outcomes.

Less common is research examining early academic variables in relation to later academic outcomes, such as in secondary school. However, recent research includes some exceptions to this general trend. For example, Duncan and colleagues (2007) used six data sets to examine early academic performance in relation to later school outcomes (through eighth grade for the latest time point). It is important to note that one of these data sets included the ELCS-K; however, the researchers only used that particular data set through the third grade. A major finding of Duncan et al.'s (2007) work was that early mathematical performance was the most significant predictor of later school performance measured by test scores ($r = .53, p < .01$) and teacher rated achievement ($r = .34, p < .05$). However, reading performance in kindergarten only had a small effect size for third grade reading test scores ($r = .18, p < .01$) and teacher-rated reading achievement in third grade ($r = .15, p < .05$), as well as attention in kindergarten only had small effect sizes for later school performance in both reading tests scores and teacher rated reading achievement in third grade ($r = .04, p < .01$; $r = .14, p < .05$, respectively). Additionally, attention only had a small effect size on math test scores ($r = .10, p < .01$) and teacher-rated math achievement ($r = .12, p < .05$). These findings held among different socioeconomic groups and across genders. Another recent study (Bodovski & Youn, 2012) found that scores on standardized math and reading tests in the fall of kindergarten predicted academic success (i.e., per scale score on IRT math and placement in an advanced math class of at least algebra) in eighth grade in the ECLS-K data set. Lastly, Claessens and Engel (2013) found that standardized math scores using Item Response Theory (IRT) probability proficiency scores were the most predictive of later academic success (math and reading) in eighth grade. Kim and Camilli (2014) reported

that, “the approached IRT approach provided growth parameters that are estimated directly, rather than obtaining these coefficients from estimated growth scores—which may result in biased and inconsistent estimates of growth parameters (p. 1).” (See Appendix A for additional information about ECLS-K studies.) Overall, these studies are consistent in demonstrating that early academic performance predicts later academic performance.

Within the social sciences, academic performance is commonly examined as both predictors of academic outcomes and as an outcome variable itself. However, less is known about how early academic performance is related to long-term behavioral outcomes (e.g., suspension and internalizing and externalizing symptoms/diagnoses). In one of the few studies in this area, Welsh and colleagues (2001) found that prosocial behavior and academic performance influenced each other from second into third grade. However, only second grade academic performance predicted third grade antisocial behavior, while antisocial behavior in second grade did not significantly predict academic performance in third grade. Within the same study, academic performance predicted both prosocial and antisocial behavior from first into second grade. This study was conducted with a relatively small sample ($N = 163$) in one geographical region, the Southwest, with a short-term longitudinal research design (Welsh, Parke, Widaman, & O’Neil, 2001). Although this study could not determine causality, it did use a more sophisticated statistical methodology, Structural Equation Modeling (SEM), which allowed multiple models to be tested to determine the best fit.

Morgan and colleagues (2008) conducted a similar study on the bidirectional relation between academic performance and behavior using advanced statistical

procedures including Hierarchical Linear Modeling (HLM). Level 1 included individual-level factors, while level 2 factors were school level variables. Level 1 was divided into whether a third grade student had problems in reading or behavior (e.g., approaches to learning (i.e., a composite of task persistence, flexibility, and organization), prosocial behavior, internalizing problems, or externalizing problems), which was determined by a 10% cutoff point. Level 2 was based on different school variables including: more than 25% of Hispanic population in the school, more than 25% Black students in the school, and percent eligible for free or reduced lunch, etc. Within this study, a bidirectional relation was found between problem behaviors and reading problems. Specifically, students with reading difficulties in first grade were more likely to demonstrate problem behavior (i.e., internalizing and externalizing problems, including ADHD symptoms) in third grade than students who did not have reading problems. Conversely, students in first grade with ADHD symptoms had significantly more reading difficulties in third grade. Consequently, it appears that a complex, transactional relation occurs between academic performance and behavior. As such, these studies' findings suggest a potential bidirectional relation and point to the importance of controlling academic performance when considering behavioral adjustment. Moreover, the findings of this study suggest the need to consider the overarching theoretical frameworks, especially risk and resiliency, which highlight the complexities of the relations between risk factors and outcomes.

Theoretical Frameworks

Two primary frameworks guide the current study: developmental psychopathology (Sroufe & Rutter, 1984) and risk and resilience (Garmezy, 1974), with ecological systems theory serving as a complementary framework (Bronfenbrenner,

1979). Developmental psychopathology and risk and resilience are explained below, as well as a brief description of the Bronfenbrenner's ecological theory of human development. Subsequently, research on early behavioral risk factors was reviewed with particular attention given to (a) what is known about future outcomes if the child possesses that risk factor (i.e., risk and resiliency) and (b) how often different early behavioral risk factors remain as a potential source of vulnerability over time (i.e., continuity vs. discontinuity).

Overview of developmental psychopathology. Developmental psychopathology is an approach to examining the pathways and different factors related to various trajectories of potential disorders (Sroufe & Rutter, 1984). Some of the major tenets of developmental psychopathology are continuity versus discontinuity and multifinality versus equifinality.

Continuity versus discontinuity, a major tenet of developmental psychopathology, suggests that there is ambiguity over whether a person's behaviors are stable or dynamic over time. Some studies support the continuity of early behavioral and socio-emotional functioning from early childhood into later development. For example, in the 1960s, Thomas and colleagues laid a foundation through several seminal works that outlined the various dimensions and clusters of temperament that are associated with future behavioral concerns (Thomas, Chess, & Birch, 1968). Research has supported that there is an established relation between the temperamental characteristic of activity level and later behavioral risk factors (McIntosh & Cole-Love, 1996). As such, children with higher activity levels in early childhood are more likely to have difficulty focusing,

controlling impulses, and to be diagnosed with ADHD when they are school-aged than their peers with low to moderate activity levels (Martin, 1994).

Other studies suggest that there may be discontinuity of a child's behavior. Within La Paro and Pianta's (2000) meta-analysis found social and behavioral variables from preschool or kindergarten to have a small effect on first and second grade social outcomes. The small effect size of La Paro and Pianta's (2000) study may suggest that there is only some continuity in behavior over time. "However, (a notable limitation of La Paro and Pianta's meta-analysis was) because of the relatively small number of studies within this domain, these estimates are likely to be unstable" (La Paro & Pianta, 2000, p.472). Given these findings, it will be crucial for future research to examine children's problem behaviors in relation to future outcomes. Both internalizing and externalizing problems should be considered, as children's behavior and social-emotional functioning can help to predict future academic performance and mental health (e.g., behavior problems; Huffman et al., 2000; Ialongo, Edelsohn, & Kellam, 2001; Ialongo, Edelsohn, Werthamer-Larson, Crockett, & Kellam, 1996; Shinn et al., 1987; Walker et al., 1998).

Developmental psychopathology also emphasizes the concepts of multifinality and equifinality, which are related to continuity and discontinuity. Multifinality highlights that individuals may encounter similar risk factors but experience different long-term trajectories (e.g., Cicchetti & Rogosch, 1996). Conversely, equifinality is when individuals with a different set of risk factors (e.g., anxiety versus ADHD) ultimately end up with the same concern (e.g., conduct problems).

The underlying concepts of developmental psychopathology (e.g., continuity versus discontinuity and equifinality versus multifinality) are crucial considerations for understanding the complex relations that are found between early behavioral factors and long-term outcomes. The next section on risk and resilience will highlight why there may be differences across individuals' trajectories.

Overview of risk and resilience. Risk and resiliency has similarities to developmental psychopathology, but it is a unique theory (Garmezy, 1974). Resiliency is defined as being able to successfully adapt in spite of facing challenges (Masten et al., 1999). The major resiliency terms are risk factor, protective factor, promotive factor, and buffer. A risk factor is any influence (e.g., biological, behavioral, or ecological) that increases the likelihood of a negative outcome, whereas a protective factor is any feature of an individual's life that lowers the likelihood of a negative outcome (Kirby & Fraser, 1997). Another resiliency term is a promotive factor, which, regardless of an individual's vulnerability, is associated with positive outcomes (Leffert, Benson, Scales, Sharma, Drake, & Blyth, 1998; Sameroff & Fiese, 2000). Lastly, there is a buffer, which is a factor that is only beneficial when an individual has a risk factor present (Gore & Eckenrode, 1994).

A type of potential resiliency factors that are particularly relevant to school performance are academic enablers, which are defined as "attitudes and behaviors that allow students to benefit from classroom instruction" Academic enablers consist of interpersonal skills (which are sometimes referred to as prosocial behavior), study skills, motivation, and engagement (Elliot et al., 2004).

It is essential to determine risk and resiliency factors since young children's behavior and social-emotional functioning can have short-term and long-term consequences in terms of academic and behavioral adjustment. Mental health concerns tend to be negatively associated with academic achievement (e.g., McLeod & Kaiser, 2004). The literature also is quite robust in showing negative associations between behavior problems (e.g., conduct problems, attention issues, and depression) and academic performance ranging from the period of early childhood through adolescence (Bub, McCartney, & Willet, 2007; DuPaul, McGoey, Eckert, & Vanbrakle, 2000; Masten et al., 2005; Reinke, Herman, Petras, & Ialongo, 2008; Lewinsohn & Essau, 2002). Consequently, behavior problems can be barriers to children's learning. However, as noted previously that past research suggests a complex transactional relation between academic performance and behavior (e.g., Morgan et al., 2008), which is aligned with the intricacies of the risk and resiliency theoretical framework.

Some studies also have found that young children's behavior and social-emotional functioning can predict behavior and mental health later in life (Huffman et al., 2000; Shinn et al., 1987; Walker et al., 1998). For example, some children may have a performance and/or skill deficit in social interactions. Children lacking in or failing to demonstrate prosocial behavior are more likely to experience academic difficulties (Hoge & Luce, 1979; McKinney & Speece, 1983). Moreover, deficits in prosocial behavior are related to short-term and long-term peer relationship difficulties (Coie & Dodge, 1983), which in turn are associated with adult psychopathology (Parker & Asher, 1987).

In addition to identifying barriers to success, potential resources for academic and behavioral adjustment should be identified early in children's school careers. While

problem behaviors may be detrimental to academic performance and future behavior, there may be potential assets, such as early school-related emotional adaptation and prosocial behavior. Early school-related emotional adaptation is a consideration for long-term academic and behavioral adjustment as children's early experiences can shape their educational trajectories (Alexander, Entwisle, & Horsey, 1997). There is also a positive association between prosocial behavior and overall school adjustment (Elliot et al., 2004; Ladd, 1990). Although research is limited, preliminary research studies suggest that prosocial behavior may be an asset especially among students with internalizing problems. In particular, possessing prosocial behavior may serve as a protective factor for students with internalizing problems in relation to academic achievement (Diperna, Volpe, & Elliot, 2002; Henricsson & Rydell, 2006). In addition, prosocial behavior is associated with lower rates of internalizing and externalizing behaviors over time than those with lower rates of prosocial behavior (Henricsson & Rydell, 2006). More research is needed on which early behavioral and academic factors are most pivotal to later outcomes, especially among a large national, diverse sample.

Overview of Bronfenbrenner's ecological theory of human development.

Bronfenbrenner's ecological theory of human development (1979) is based on the centrality context to children's development. There are various systems in which children develop, including the macrosystem, a larger system (e.g., living in the United States), the exosystem (mandatory school attendance laws), multiple microsystems (like home and school), the mesosystem (interactions between microsystems), and the chronosystem (transitions over the life course and sociohistorical events). Consideration of this larger context helps to consider the complexity and interaction of different systems within a

child's development. For example, a student whose family is vulnerable (e.g., living in poverty) may be more likely to face circumstances of instability (e.g., number of residential moves), which can make it difficult to withstand stressors (Ackerman, Kogas, Youngstrom, Schoff, & Izzard, 1999; Bronfenbrenner & Evans, 2000).

A related extension of Bronfenbrenner's theory, are alterable variables (e.g., prosocial behavior) and unalterable variables (e.g., gender), within a child's developmental context (Christenson, 2008). Alterable variables are those that are more easily changed; unalterable variables are difficult or even impossible to change. Although unalterable variables or demographic characteristics are not easily rendered, they allow researchers and practitioners to identify particular groups of children who are at greater risk for maladjustment. For example, low socioeconomic status has been associated with academic and behavioral maladjustment (Farrington, 1991; The National Center for Education Statistics, 2008; Office of Juvenile Justice and Delinquency Prevention, 1995). Consequently, identifying unalterable variables can help pinpoint groups of children who are at risk, whereas alterable variables can assist in recognizing which areas to address in prevention and intervention efforts.

Early Behavioral Resiliency Factors

Of these three guiding frameworks, risk and resilience was the most central to the current study. Consideration of resiliency factors can be useful, as these factors provide an alternative to the deficit model of the 1950's that focused solely on risk factors. There are different types of resources, external and internal, which can facilitate optimal development (Howard, Dryden, & Johnson, 1999). Some external assets are support (e.g., parental), empowerment (e.g., community values young children), boundaries (e.g., consistent consequences), and constructive use of time (e.g., time in different activities at

home; Search Institute, 2005). There also are internal assets in early childhood which include but are not limited to commitment to learning (e.g., early literacy), positive values (e.g., responsibility), social competencies (prosocial behavior), and positive identity (e.g., personal power or assertiveness; Search Institute, 2005). Within this current study, the primary focus was on internal resources (e.g., early school-related emotional adaptation and prosocial behavior), while still recognizing the importance of context in line with Bronfenbrenner's ecological framework (1979) through inclusion of demographic variables (e.g., child and family background).

Early school-related emotional adjustment. The kindergarten transition can be challenging for young children, especially due to the changes in their social context and their development. Certain groups of children, such as extremely shy or disruptive children, may be more likely to have difficulty adjusting to kindergarten (Rimm-Kaufman, Pianta, & Cox, 2000). If children attended an Early Childhood Education (ECCE) program prior to kindergarten, they still may experience challenges adapting to their new school environment. For example, there are larger ratios of children to teachers and generally more academic demands placed upon children in kindergarten than in ECCE settings (Holloway & Reichhart-Erickson, 1988; Sanders et al., 2005). In general, this shift in expectations may be challenging for kindergarten students as self-regulation is still developing in the prefrontal cortex (Anderson, 2002).

Early school-related emotional adaptation may be especially difficult for students with certain temperaments. For example, students who are avoidant, disruptive, or both may have difficulty adjusting to a new school environment. Some of the new academic and social expectations (e.g., to initiate and engage in social interactions and class

discussions) in their school setting (Daly & Korinek, 1980) may be too intimidating for extremely shy students, who may present with avoidant behavior (Asendorf & Meier, 1993). Young children who also lack prosocial behavior and instead engage in antisocial behaviors are more likely to experience school maladjustment (Ladd & Burgess, 1999). As such, early-related school emotional adaptation may be more challenging for students with certain temperamental qualities, which have underlying biological components.

Past research has emphasized the teacher-child relationship as an aspect of school adaptation (Pianta & Steinberg, 1992). This relationship may be impaired for children who are too dependent on their teacher, including shy children who act clingy with their teacher, as well as for disruptive children who are noncompliant and/or have attention issues. Furthermore, children who are considered too dependent on their teacher also are more likely to report disliking school and have academic difficulties in comparison to peers who have positive, close relationships with their teacher (Birch & Ladd, 1997; Pianta & Nimetz, 1991). There appear to be short-term and long-term implications of children's dependent relationships in kindergarten with their teacher. High levels of dependency were associated with low competency levels and high levels of problem behaviors in first grade (Pianta & Nimetz, 1991; Pianta & Steinberg, 1992; Pianta, Steinberg, & Rollins, 1995), as well as with low academic performance (i.e., grades) and a negative disciplinary record (e.g., presence or absence of suspensions) through eighth grade (Hamre & Pianta, 2001). Moreover, children who are dependent on their teacher may also be more likely to be perceived as being timid and lacking behavior (e.g., assertiveness; Kagan, 1997) that are associated with academic success (Elliot et al., 2004). (Prosocial behavior will be discussed in depth in a later section.) In addition,

children with behavioral concerns are more likely to have negative relationships with their teacher and report low levels of liking school (Ladd & Burgess, 1999).

In terms of early school-related adjustment, the current literature review will focus primarily on children's school attitudes. Children's early school attitudes may be a potential risk factor for later school problems (Rumberger, 1995). Students who have more reluctant attitudes towards attending school in their early school career may be less likely to attend school in their future school careers (Alexander et al., 1997). It is noted that children's attitudes towards school tend to be relatively stable; however, there may be declines over time among children who initially held positive beliefs (Anderman & Maehr, 1994). Children's attitudes towards school may be influenced by their early academic performance (Rush & Vitale, 1994), a phenomenon that was discussed above. However, including early school-related emotional adaptation in a screener in kindergarten may also help identify children early on who have and may maintain negative school identities without early identification and intervention efforts.

Most of the extant school adaptation studies have examined this construct mainly through parent and teacher report. Steven and Cope (2003) conducted a related exploratory study in Scotland, consisting of a small sample size of 27 children who were studied during the transition from preschool to primary school (i.e., elementary school). Most of the children were able to transition without the teachers noting any concerns. However, there were some children who needed additional time or had difficulty adjusting to the classroom expectations and routines. Parents and teachers tended to attribute adaptation issues among these young children differently. In this study, parents were more likely than teachers to attribute difficulty adjusting to a new learning

environment indicative of disliking school or having trouble with parent separation. Teachers, in contrast, were more likely than parents to perceive children's transition issues as being a child-based problem (e.g., low maturity or confidence). Another finding of the study was that the students' teacher rated six of twenty-seven children as having adaptation issues (i.e., inappropriate responses to classroom expectations and routines), but the same teacher-reported that half of those students resolved these concerns by the end of the school year. There are several notable limitations in Steven and Cope's study, including generalizability due to the small, international sample and the fact that all of the kindergarten students in the sample had attended preschool. Another major limitation was the cross-sectional nature of the data, which only measured short-term transition adjustment. Consequently, there is a need to examine the relation between early school-related emotional adaptation and long-term outcomes using a larger sample within the United States.

Rimm-Kauffman and Pianta (2000) conducted another school adaptation study among kindergarten students within the United States with a larger sample size. A strength of this study was that it was conducted among a national sample of approximately 3,600 teachers. Teachers were asked about how often they perceived different types of problems among the students in their classrooms. Teachers in this study reported the following adaptation issues as being present in half of the students in their class or more: difficulty following directions (about 46% of teachers), academic skill deficits (about 36% of teachers), and social skill deficits (about 20% of teachers). This study also examined demographic variables systematically. A major finding was that district poverty level was related to teacher perceptions of student adaptation with lower

income students eliciting more concerns. A limitation of this study was that parents' perceptions of the children's adaptation were not collected. Based on the findings of Steven and Cope's (2003) study, parents may be better at identifying a mismatch between the child and the environment than teachers, because the latter may be more likely to perceive problems being within the child. Consequently, parent report may offer more insight than teacher report into a child's perspective on school.

Summary of early school-related emotional adjustment. In closing, early school-related emotional adjustment, an aspect of early behavioral factors in this study, should be considered in terms of long-term academic and behavioral adjustment. Kindergarten is children's first official exposure to schooling, and research suggests that school adaptation is crucial, because it is associated with long-term educational trajectories (Anderman & Maehr, 1994; Rumberger, 1995). Often children with certain temperaments, such as those who are characterized as timid or defiant, are more likely to be rated as having adjustment issues based on teacher ratings (Ladd & Burgess, 1999). Some research suggests that parents may perceive school adjustment more as a fit between their child and their environment, embracing more of an ecological perspective (e.g., Steven & Cope, 2003). Consequently, parent ratings may help bolster our understanding of student adjustment.

Having more positive experiences with school may offset future school avoidance and bolster school outcomes. Using early school-related emotional adaptation as a predictor may help inform the Early Warning System (Hickman, Bartholomew, Mathwig, & Heinrich, 2008), which is a systematic way to determine risk factors for school maladjustment (e.g., school dropout). Moreover, students who are rated as having better

early school-related emotional adaptation than their peers may be more protected from school maladjustment than their counterparts with lower levels of early school-related emotional adaptation.

Prosocial behavior. Another potential protective factor is prosocial behavior. Prosocial behavior is defined as “(a) voluntary behavior (that) is intended to benefit another” (Eisenberg et al., 2006, p. 646). Researchers initially focused on problem behaviors due to their association with negative outcomes (e.g., incarceration); however, during the 1970s more researchers investigated prosocial development (Eisenberg et al., 2006). A meta-analysis of prosocial behavior found the five most common social dimensions were: 1) peer relations, 2) self-management, 3) academic, 4) compliance, and 5) assertion (Caldarella & Merrell, 1997). For the purpose of the current literature review, cooperation, an aspect of compliance, self-management in response to others’ actions, and assertion, a dimension of prosocial behavior, will be examined. Overall, prosocial behavior has been studied far less among young children than it has among older youth and adults (Eisenberg et al., 2006). The rationale for examining prosocial behavior is due to its positive association with school adjustment (Elliot et al., 2004; Ladd, 1990).

Factors influencing prosocial behaviors. There are several factors associated with prosocial behavior. Environmental and genetic variables appear related to the development of prosocial behavior (Deater-Deckard, Pike et al., 2001; Eisenberg et al., 2006; Knafo & Plomin, 2006). Extant research for preschool and school-aged children suggests that environmental factors (e.g., parenting, such as supportive practices) are more associated with prosocial behaviors than with genetic factors (Deater-Deckard, Pike

et al., 2001). However, genetic factors may become more important from toddler age (i.e., 2 years old) into early school-age (i.e., 7 years old; Knafo & Plomin, 2006).

This literature review will focus on demographic variables (e.g., age and gender), which relate to genetic and environmental factors. In terms of age, a meta-analysis found that prosocial behavior significantly increased from infancy/toddlerhood (i.e., less than 3 years old) into preschool age (i.e., 3 to 6 years old; Eisenberg & Fabes, 1998). However, research suggests continuity within an individual in terms of a general trajectory of prosocial behavior, which will be further discussed in the prosocial behavior continuity and discontinuity section (Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002). Gender differences also play a role in prosocial behavior, with females being rated higher in this behavior than males (Côté et al., 2002; Eisenberg & Fabes, 1998). In particular, Eisenberg and Fabes (1998) found there was a moderate effect size for gender in terms of prosocial behavior. However, a potential measurement issue is that some of prosocial behavior gender differences may be related to biased items within the measures that attribute to females being rated higher than males (Zarbatany, Hartmann, Gelfand, & Vinciguerra, 1985).

Conversely, there are some factors that are negatively associated with prosocial behavior. For example, ADHD symptoms (e.g., DuPaul, McGoey, Eckert, & VanBrakle, 2001) and conduct problems (e.g., Hay & Pawlby, 2003) are negatively related to prosocial behavior. DuPaul and colleagues (2001) found preschool children between the ages of 3 and 5 with ADHD were rated by both teachers and parents as having statistically significant lower levels of prosocial behavior than a control group. Although the study may have limited generalizability, as it was conducted within one geographical

region and the sample was relatively homogenous in terms of race/ethnicity and socioeconomic status (SES), the findings suggest ADHD may be a risk factor for failing to develop prosocial behavior among young children. There also have been several studies that have found children who exhibit conduct problems tend to demonstrate less prosocial behavior (Hay & Pawlby, 2003; Nagin & Tremblay, 2001; Welsh, Parke, Widaman, O'Neil, 2001).

Prosocial behavior: Academic and behavioral implications. Various studies have found that social behavior appears to have short-term and long-term academic and behavioral implications. There are several studies that suggest prosocial behavior is positively associated with achievement (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Malecki & Elliot, 2002; Vaughn, Hogan, Lancelotta, Shapiro, & Walker, 1992; Wasik, Wasik, & Frank, 1993; Wentzel, 1993). First, cross-sectional studies will be reviewed, followed by short-term longitudinal and lengthier longitudinal studies.

Vaughn and colleagues (1992) conducted a study that supports the relation between prosocial behavior and academic achievement. Within this cross-sectional study, there were kindergarten students with low and severe behavioral concerns, including internalizing problems (i.e., anxiety and depression) and externalizing problems (i.e., conduct problems and attention), as well as a control group (i.e. without behavioral problems). These students were drawn from three schools in a large district in the Southeastern United States. Students with internalizing and externalizing problems were rated by teachers as having significantly lower levels of prosocial behavior than students without these problem behaviors. Moreover, students in the control group had

significantly better reading achievement scores (i.e., standardized tests). Some limitations of the study were that only teachers rated prosocial behavior and that the study was conducted within only one geographical region, which may decrease generalizability. Also, due to the relatively small sample size of this study, gender and race/ethnicity differences could not be explored. Consequently, these are areas of consideration for future research.

Students who may be vulnerable due to risk factors may particularly benefit from demonstrating prosocial behavior, as it may serve as a protective factor against maladaptive outcomes (Henricsson & Rydell, 2006; Kwon et al., 2012; Teo, Carlson, Mathieu, & Egeland, 1996). In one longitudinal study, children from low SES backgrounds who had better cumulative prosocial behavior (i.e., average scores derived from first, second, third, sixth grade, and at 16 years old) had better grades in reading and math in high school than students from similar backgrounds with lower levels of cumulative prosocial behavior (Teo et al., 1996). In a recent cross-sectional study, Kwon and colleagues (2012) examined both prosocial and problem behavior in early elementary school (i.e., kindergarten through third grade), as well as other background risk factors. Students with a risk factor of low parental education performed better in reading when they were rated as having higher levels of prosocial behavior than students facing the same risk factor but who had low rates of prosocial behavior. In this study, students were recruited from a Midwestern city within the United States and an adjacent area from 21 public and private elementary schools. The sample consisted of a predominantly Caucasian sample, as well as about a quarter of Black, Latino, and other ethnic/racial groups. This study was the baseline data of part of a larger, longitudinal study, evaluating

Conjoint Behavioral Consultation (Sheridan & Kratochwill, 2008). Kwon and colleagues (2012) found that prosocial behavior among early elementary school students was positively correlated with reading and math scores. They also found that prosocial behavior contributed more to variance in achievement than externalizing behavior did, in line with some previous studies (Caprara et al., 2000). An unusual feature of the data that should be noted was that children with externalizing behaviors had average academic performance in reading and math, which varies in its results from several past studies (Bub, McCartney, & Willett, 2007; Hinshaw, 1992a). Kwon and colleagues (2012) suggest two possible underlying reasons for this difference. One proposed reason is due to potential selection threat of the sample, while another reason may be the context of early elementary school, with less academic rigor and potentially less time for the full relation between externalizing issues and achievement to emerge. Overall, this study found that prosocial behavior had more of a predictive relationship than did externalizing behavior and may protect against risk factors (e.g., SES background).

Also cross-sectional studies of later elementary school suggest a relation between prosocial behavior and achievement. Wentzel (1993) conducted a study in a secondary school, including sixth and seventh grade students who lived in the Midwest. This study had one time point and found that prosocial behavior positively and problem behaviors negatively predict academic performance (i.e., grades), while controlling for sex, ethnicity, and other demographic variables. Another study also found that prosocial behavior and problem behaviors predicted current academic performance (i.e., standardized test scores in reading and math) in third grade, but only prosocial behavior served as a predictor for fourth grade academic performance (standardized scores in the

same academic subjects; Malecki & Elliot, 2004). This study drew from a diverse sample in the Northeast and used the SSRS (Gresham & Elliot, 1990) to measure prosocial and problematic behavior.

There also are studies that use short-term longitudinal designs that have found associations between prosocial behavior and achievement. Bulotsky-Shearer and colleagues (2012) have found a positive relation between prosocial behavior and achievement across various studies; however, many of these studies were conducted among a preschool population (e.g., Head Start). The following studies will examine these constructs among early elementary school students. For instance, when children were designated as more prosocial (e.g., more helpful) in kindergarten than their peers, they were significantly less likely to be rated as at-risk for school failure by their second grade teachers (Wasik et al., 1993). The participants in this study were from a suburban area in the South, with a sample consisting of primarily Caucasian students with about a quarter Black students. A limitation of this study was that teachers rated students who they perceived as at risk for school failure, but they did not rate specific student characteristics, such as prosocial behavior. Rather, prosocial behavior was only identified through peer nomination.

Another study found short-term implications of prosocial behavior in relation to academic success. Teacher ratings of students' kindergarten level of cooperation, a component of prosocial behavior, were positively associated with academic success in first grade (Agostin & Bain, 1997). The sample was drawn from the Southeast from three elementary schools with a predominantly Black sample. Some limitations of this study

were that screening was conducted at the end of kindergarten rather than towards the beginning of the school year and its short-term longitudinal design.

It should be noted that there may be more complex relations between prosocial behavior and academic outcomes at work. For example, a study using structural equation modeling suggests a transactional relation between prosocial behavior and academics in elementary school (i.e., second into third grade; Welsh et al., 2001). Therefore, it seems that both variables influenced each other.

It is also noteworthy that some studies found that prosocial behavior was not significantly associated with achievement. For example, Duncan and colleagues (2007) analyzed six sets of longitudinal data to determine which early childhood variables were associated with academic success. Within this meta-analysis, prosocial behavior was not found to be a significant predictor of academic achievement as it had been in previous studies, even when children were rated higher in problem behaviors than their peers. Rather, the primary predictors of long-term achievement in this study were early academic skills (math and reading) and attention (in that order). Some limitations of the study were not evaluating outcomes, such as behavioral concerns (e.g., internalizing and externalizing concerns) or later disciplinary records that are also aspects of adjustment.

There is also research linking children with high levels of prosocial behavior with behavioral adjustment. Research has examined both short and long-term implications for prosocial behavior. For example, Hay and Pawlby (2002) found that 4 year-old children from London who were rated as more engaged in a cooperative task with their mother had significantly fewer problems on the Child Behavior Checklist than peers who were rated as less engaged (CBCL; Achenbach, 1988). In a study of more distal impacts,

young boys were recruited from schools in Montreal with high concentrations of low SES students (Nagin & Tremblay, 2001). The boys who were rated as having higher levels of prosocial behavior in early primary school (i.e., six years old) than their peers went on to have significantly lower levels of aggression and externalizing problems in high school than students with lower levels of prosocial behavior. In fact, boys with higher prosocial behavior were half as likely to demonstrate aggressive behavior in high school. However, some limitations of this study included a different context (i.e., Montreal, Canada) and only inclusion of male students.

Notably, prosocial behavior associations with academic and behavioral outcomes may vary based on ecological factors. Initial research suggests if a child demonstrated prosocial behavior in multiple settings (e.g., home and school) then there was a greater likelihood of future prosocial behavior than those who displayed such behavior within only one setting (Veenstra, 2006; Vitaro, Gagnon, & Tremblay, 1991). However, less is known about academic and behavioral implications when there is consistency across raters. One preliminary finding suggested that consistency across raters for prosocial behavior may differ in its relation to outcomes (Veenstra, Lindenberg, Oldehinkel, De Winter, Verhulst, & Ormel, 2008). Whereas, more is known about the pervasiveness of externalizing problems (e.g., across multiple settings) as individuals with these behavioral concerns tend to be more vulnerable for negative outcomes (Campbell, Shaw, & Gilliom, 2000).

Another consideration is simultaneous examination of prosocial and antisocial behavior. Fabes and colleagues (1999) indicated that there is a paucity of studies that examine these constructs in tandem. Recently, some researchers have begun to explore

these constructs within the same study. Veenstra and colleagues' (2008) study simultaneously examined both prosocial behavior and antisocial behavior (i.e., externalizing problems) among a large sample ($N = 2,230$) of Dutch preadolescents (mean age approximately 11 years old) using the first wave of data of a longitudinal study, the Tracking Adolescents' Individual Lives Survey (TRAILS). This study found that ratings of prosocial behavior varied across informants. Within this study, there were higher levels of agreement for prosocial and antisocial behavior within a teacher's ratings than within a parent's ratings (Veenstra et al., 2008). Another major finding was that teachers and parents had higher levels of agreement for antisocial behavior than for prosocial behavior. Lastly, teachers' ratings of prosocial and antisocial behavior were both associated with academic performance. However, students who were consistently rated as having higher levels of prosocial behavior (i.e., across teacher and parent) had significantly lower academic performance than students who were only rated as having higher levels of prosocial behavior by their teachers. However, a major notable limitation of this study was that the construct of academic performance was only based on teacher ratings of effort and achievement in math and reading, omitting more objective measures, such as grades and/or standardized test scores. Another limitation of this article was it only consisted of one time point within early adolescence. Some strengths of this study were its simultaneous inclusion of two constructs, prosocial and antisocial behavior, as well as data being from two sources (i.e., parent and teacher) across settings (i.e., home and school). Future research can expand the literature by simultaneously examining both antisocial and prosocial behavior among a young cohort of students over time and across settings.

Prosocial behavior: Continuity and discontinuity. Some of the previous research suggests continuity of prosocial behavior. In general, there is an increase in levels of prosocial behavior from childhood into adolescence (Eisenberg & Fabes, 1998). However, it is notable that within an individual, prosocial behavior (e.g., helpfulness) tends to remain relatively stable from early elementary into late elementary school (Côté et al., 2002). Although the continuity of prosocial behavior could not be explored within the current study due to the nature of the ECLS-K data collection, future research should examine the developmental course of prosocial behavior.

Summary of prosocial behavior. Prosocial behavior is a potential protective factor for student outcomes. Several studies suggest that prosocial behavior is positively associated with short-term and long-term academic and behavioral outcomes, although there are some mixed findings within the literature. More specifically, there are some studies that have found prosocial behavior to be an insignificant predictor of academic outcomes. Additional research needs to be done to determine the stability of prosocial behavior; however, some of the previous research suggests that there is continuity in terms of the general trajectory. The current study focused on whether prosocial behavior in early childhood is related to academic and behavioral adjustment in middle childhood.

Overview of early behavioral risk factors. In addition to identifying protective factors, it is also important to identify which students are most vulnerable to negative academic and behavioral trajectories through determining the most salient early behavioral risk factors. An accumulation of risk factors may be particularly detrimental for adjustment (e.g., Blackman et al., 2005; Friedman & Chase-Lansdale, 2002). The following sections will discuss an overview of problem behaviors, which will be

followed by sections on both internalizing (i.e., depression and anxiety) and externalizing issues (i.e., conduct problems and ADHD). In terms of each type of problem behavior, an overview, factors influencing it, academic and behavioral implications, as well continuity and discontinuity will be addressed.

Problem behaviors. Problem behaviors (e.g., internalizing and externalizing) in early childhood have been examined as behavioral risk factors during school entry and have been found to help predict both future academic performance and mental health (e.g., behavior problems; Huffman et al., 2000; Ialongo, Edelsohn, & Kellam, 2001; Ialongo, Edelsohn, Werthamer-Larson, Crockett, & Kellam, 1996; Shinn et al., 1987; Walker et al., 1998). Internalizing behaviors are considered “over-controlled,” as the individual’s actions are often inwardly directed. These types of problems may be more difficult to identify as these behaviors are subtler than externalizing behaviors, which often result in classroom disruptions or violations of school rules. On the other hand, externalizing behaviors are considered “under-controlled” because an individual’s behaviors are outward and in some cases directed at others (Merrell, 2008a). This latter type of issues is the most common mental health referral concern among youth (Kazdin, 1995). Overall, the National Institute of Mental Health estimate that about 1 in 10 youth under 18 years old experience mental health issues that significantly impair their functioning (as cited in Graber & Sontag, 2009).

According to Carter and colleagues (2004), there are few epidemiological studies regarding the prevalence of DSM-IV disorders among young children. One of the few studies conducted was among a British sample of 5 to 7 year old children, which found nearly 8% for the prevalence rate of mental health disorders, including internalizing and

externalizing types. Carter and colleagues (2004) highlighted that there is more ambiguity in terms of operationalizing school and social impairments among young children than among older children and adults. Specifically, the DSM-IV does not delineate among young children what constitutes developmentally appropriate adjustment issues versus school and social impairments. Although there tend to be higher prevalence rates when impairment is omitted from diagnosis, data still suggest that a substantial number of young children demonstrate problem behaviors within a clinical range when this impairment is required (Carter, Wagmiller, Gray, McCarthy, Horowitz, & Briggs, 2010). The prevalence of DSM-IV disorders was examined in a healthy cohort, and about one in five students at school entry were diagnosed with a mental health problem when impairment was required (Carter et al., 2010).

Carter and colleagues' study (2010) suggests that there is a need for early diagnosis. However, this study had some notable limitations. Although this study was conducted with a healthy, representative sample, it was conducted within a small Northeastern area, limiting its generalizability. Also the study utilized the Diagnostic Schedule for Children Version 4 (National Institute of Mental Health (NIMH); DISC-IV), which is a time intensive tool. In practical application in order to maximize the number of students screened within a school, it may be more desirable to use a more efficient assessment.

A major reason for examining problem behaviors in early childhood is they are able to determine which aspects of behavior are most influential to short-term and long-term outcomes. Problem behaviors in early childhood often negatively correspond with achievement in early childhood education, as well as negatively predict later achievement

(e.g., Ialongo et al., 2001; Ialongo et al., 1996). Research supports that early internalizing and externalizing problems in early childhood are associated with later behavioral difficulties in adolescence and adulthood (American Psychological Association (APA), 2013; Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005). However, it is noteworthy that these trajectories may vary, as early risk factors are not definitive predictors of future outcomes. This concept of multifinality will be discussed later in the continuity and discontinuity sections.

Internalizing problems. Internalizing problems include anxiety and depression. There are several forms of anxiety and depression, which will only be briefly explored, as the current literature review will not differentiate among subtypes of these problems but rather will examine internalizing problems as a cluster of symptoms. Although anxiety and depression are often studied separately, there is ambiguity regarding whether depression and anxiety are actually separate constructs (Compas & Oppedisano, 2000). The reason for combining internalizing disorders into a cluster in many studies is comorbidity, which is when there are two coexisting disorders that occur at a rate that is higher than chance (Mash & Dozois, 2003). Previous research has shown considerable comorbidity between anxiety and depression (ranging from 10 to 50%). (Please note that this level of comorbidity was found among youth who were drawn from community samples.) Those youth had been primarily diagnosed with depression were more likely to have comorbid anxiety (25 to 50%), whereas youth with a primary diagnosis of anxiety were less likely to have a comorbid diagnosis of depression (10-15%; Angold, Costello, & Erkanli, 1999; Axelson, & Birmaher, 2001). However, it should be noted that these

studies on comorbidity were conducted among older youth so generalizability to early elementary school students may be limited.

Variations in prevalence rates for internalizing disorders may occur for several reasons. Two potential explanations for their variations are differences in measurement (e.g., single, multiple time points, or lifetime criterion) and whether duration and impairment in daily functioning are considered for diagnosis of disorder. Graber and Sontag's (2009) analysis found that when a single time point is used, there are significantly lower prevalence rates for anxiety disorders in comparison to when multiple time points are used. This may suggest an increase in internalizing disorders at an older age that will be further discussed in the factors influencing internalizing disorders section. With regard to depression, Kessler and colleagues (2001) found that the lifetime prevalence rate for Major Depressive Disorder among children and adolescent to be between 4% and 25% (Kessler, Avenevoli, & Merikangas, 2001). When duration is included in the diagnostic criteria, 6 months or more is required for anxiety, whereas a duration of 2 weeks or longer is needed for depression (APA, 2013). However, in some cases preschool depression may be examined, and this construct is defined by criterion that may fall below 2-week duration and only 4 symptoms, rather than 4 symptoms, is required (Gaffrey, Belden, & Luby, 2011).

In terms of impairment, Masten and Curtis (2000) noted that what constitutes developmentally appropriate criteria for impairment in youth can be difficult to determine. When functional impairment is required for diagnosis, lower prevalence rates are found (e.g., anxiety disorder; Zahn-Waxler Shirliff, & Marceau, 2008). Consequently, it is important to note whether this was a consideration within a study.

Examining internalizing problems also can be complicated by comorbidity with externalizing disorders or the presence of complex disorders. Research suggests there is a frequently occurring comorbidity between internalizing disorders and externalizing disorders (Boylan, Valliancourt, Boyle, & Szatmari, 2007). Boylan and colleagues (2007) found a moderate level of comorbidity between internalizing problems and externalizing problems in several cross-sectional studies, with about 25% of children diagnosed with ODD also being diagnosed with internalizing disorders. An important developmental consideration is that the DSM-5's criteria allow youth to manifest a mood issue through irritability, unlike among their adult counterparts who must demonstrate depressive symptoms (APA, 2013). Notably, practitioners and educators may only perceive externalizing problems among youth, as some children appear irritable, resulting in frustrating interactions with adults (Ge, Best, Congers, & Simons, 1996). Another possible diagnosis with a child shows comorbid internalizing and externalizing problems is Pediatric Bipolar Disorder (PBD), a mixture of manic episodes, including elation and grandiosity, as well as episodes of depression (for a brief review see Graber & Sontag, 2009). Although PBD is beyond the scope of this literature review, it is important for practitioners to be aware of various presenting mental health issues that may interfere with school success. Given the moderate rates of comorbidity for including children with a range of both internalizing and externalizing disorders, research that examines both types of problems better matches the true complexities found within individuals.

Another overarching issue in the literature examining internalizing problems is how they may be prevented. For example, Graber and Sontag (2009) noted that it has been suggested that internalizing problems be considered through a different framework

other than strictly disorders and subclinical symptoms. Compas and colleagues have conceptualized a framework that supports a continuum of internalizing disorders, as opposed to a more rigid categorization of internalizing disorders (Compas, Ey, & Grant, 1993; Compas & Oppedisano, 2000). The three major components of Compas and colleagues' model, from most to least intense, include 1) disorders, 2) syndromes or subclinical concerns, and 3) internalizing moods. This framework informs the focus of the following discussion, as the internalizing problems outlined below will not be based on disorders but rather on a broader continuum.

Factors influencing internalizing problems. There are a number of factors that are associated with internalizing disorders in childhood. These include genetics, home environment, temperament, and demographic factors (e.g., age and gender). Children with depressed parents are three times more likely to have a lifetime history of Major Depressive Disorder (MDD; Weissman, Wickramaratne, Nomura, Warner, Pilowsky, & Verdeli, 2006). Additionally, twin and adoption studies reveal that about 50% of variance in mood disorders can be accounted for by genetics (Birmaher et al., 1996). Overall, home environment and genetics appear to have a complex, transactional relation, as both genetics and exposure to depressive behavior can influence a child's mental health (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). For example, Child A, who faces various risk factors, genetically and environmentally, may be at greater risk for maladaptive outcomes (e.g., Major Depressive Disorder) due to an accumulation of risk factors; whereas, Child B who was adopted by well-adjusted parents and only has genetic vulnerability may be less likely to succumb to depression. Consequently, in the former case, Child A, faces challenges in both the genetic and environmental spheres may be

more vulnerable to depression, due to a genetic predisposition toward depression and living with a depressed role model (e.g., a withdrawn parent that engages in few in pleasant activities). Child A's exposure to parents withdrawing from pleasant activities (e.g., social interactions) may experience more symptoms, triggering a reduction in natural chemical production of serotonin that is associated with happiness. In turn, Child A may also withdraw from interactions and experience less serotonin production. However, in spite of a genetic predisposition and exposure to internalizing disorders, a child living with a depressed biological parent(s) may not personally experience depression, in line with multifinality. A potential protective factor for a child may be prosocial behavior, as Child A may be able to have positive interactions at school and be able to overcome a genetic predisposition and exposure to depression at home. Although this example is oversimplified, it provides a brief overview of the potential buffer (e.g., prosocial behavior) that offsets genetic and environmental (e.g., home) influences. Although a full review of the literature on genetics and environmental exposure to parents' depression patterns and their interactions exceeds the scope of this literature review, it is important to acknowledge the complex interactions among the risk and protective factors.

Some research also suggests that temperament is a precursor to internalizing problems. Rapee and colleagues (2005) found that 90% of extremely shy children (in the top 15% of a preschool sample who were identified through laboratory observation and maternal report) met criteria for internalizing disorders. Although this literature review will not examine personality/temperament, this consideration may be helpful for

practitioners and educators, as internalizing disorders can be more difficult to identify as these disorders tend to be more easily missed than externalizing disorders.

There are also differences found in demographic patterns for internalizing problems. As previously discussed in the overview section on internalizing disorders, prevalence rates seem to vary based on age. Studies suggest higher prevalence rates of depression and anxiety among older than younger children. In terms of anxiety, some interesting patterns have been found. Data suggest higher rates of specific forms of anxiety in early childhood, whereas other types of anxiety are more prevalent during adolescence (Costello, Egger, & Angold, 2004). The prevalence rate for Major Depressive Disorder (MDD) during adolescence ranges from 15% to 20%, which is higher than the rates of 1.5% to 2.5% found among school-aged children (Birmaher et al., 1996; Lewinsohn & Essau, 2002). There is also evidence of gender differences in rates of internalizing disorders, but many of these differences are not consistently found, differ among subtypes, and/or do not typically emerge until adolescence. During early childhood, separation anxiety is typically higher among females than males, whereas some data suggest higher rates of generalized anxiety disorder (GAD) among males than females during this developmental period. However, during adolescence, there are higher prevalence rates of GAD among females than males (Bowen, Offord, & Boyle, 1990; McGee et al., 1990).

Internalizing problems: Academic and behavioral implications. Early identification of internalizing problems is important, as various studies suggest that these type of problems may have implications for short-term and long-term academic and behavioral adjustment (Bornstein, Hahn, & Haynes, 2010; Obradović, Burt, & Masten,

2009; Rapport et al., 2001). However, it is noteworthy there is some ambiguity in the literature, as there are few studies examining internalizing disorders for young children in relation to outcomes, particularly in terms of academics.

Some studies suggest relations between internalizing problems and academic concerns. However, much of the extant literature examines these relations among older youth than kindergarten aged-students. A cross-sectional study found that internalizing problems (i.e., depression, anxiety, and withdrawal) were more related to concurrent achievement and cognitive functioning (i.e., vigilance and short-term memory) than to intelligence (Rapport et al., 2001). It should be noted that the researchers in this study did not use a direct relation between internalizing problems and academic achievement but found that its effect was mediated by cognitive functioning. There are some related research design limitations that should be highlighted. For example, this study's sample ranged from ages 7 to 15, which may limit its generalizability to a younger population (i.e., kindergarten-aged children). A previous study conducted among a sample of French Canadian students found a direct and significant, negative relation between internalizing problems in kindergarten and achievement in first grade (Normandeau & Guay, 1998). The finding among this younger sample suggests there may be a direct relation between internalizing problems and academic concerns among younger children longitudinally (i.e., French and math in first grade; Normandeau & Guay, 1998). Another potential limitation for generalizability of Rapport and colleagues' (2001) study was that the sample was drawn only from one geographical area (i.e., Hawaii), in which the population's ethnicities are not representative of the United States' census population.

Moreover, the research design was cross-sectional, which makes it difficult to determine the directionality of the relations found between internalizing problems and achievement.

Another study examined internalizing behaviors in relation to academic outcomes among early adolescents (Henricsson & Rydell, 2006). A major finding of this study was that sixth-grade students, who had been previously rated by third-grade teachers as having higher internalizing problems, had lower teacher-rated achievement scores in sixth grade than their peers without problem behaviors in third grade. Although there were long-term data on internalizing problems available from the first grade, the researchers did not evaluate the relations between early childhood internalizing problems (i.e., first grade) and long-term academic achievement in sixth grade. Moreover, only the continuity of internalizing problems from third into sixth grade was evaluated, and moderate stability ($r = .53, p < .001$) was found between internalizing problems during this time period. Nonetheless, this study provides some support that internalizing problems from earlier grades (i.e., third grade) could be related to achievement, as this study's findings suggest continuity of these types of internalizing problems. Some strengths of this study were that it controlled for ethnicity and parental education, and it incorporated mental health concerns (internalizing problems and externalizing problems) and a potential asset (social competence). One limitation of the study was that only teachers reported problem behaviors. However, teachers' ratings of problematic behavior in third grade were compared to parents' ratings of behavior for the same grade. A strong, positive correlation ($r = .55$) was found between raters for externalizing behaviors, whereas a weak positive relation ($r = .23$) was found between raters for internalizing behaviors. Another limitation of this study was the three group categorization: (1)

internalizing problems, (2) externalizing problems, and (3) a problem-free group. Therefore, this research design omitted students who had high clinical comorbid symptomatology for internalizing and externalizing disorders, as scores had to be below a certain threshold in one disorder (e.g., internalizing) to be categorized under the other disorder (e.g., externalizing). Another limitation was that students were only followed from first grade and were recruited from schools in Sweden, which raises the question of generalizability to an American kindergarten sample for mental health and academic outcomes.

There is some ambiguity regarding whether problem behaviors, such as internalizing problems, are negatively related to long-term school success, especially among young children. There are some studies that have found relations between problem behaviors and school success (Bulotsky-Shearer, Bell, Romero, and Carter, 2012; McLeod & Kaiser, 2004.) A longitudinal study found that children ranging from 6 to 8 years old with internalizing problems were less likely to graduate from high school than peers without these initial mental health concerns (McLeod & Kaiser, 2004). This sample was drawn from the Children of the National Longitudinal Surveys of Youth (1986-2000), which included Caucasian and Black participants. While this study examined the relations between internalizing problems and academic outcomes, the researchers omitted the future examination of internalizing problems, which would have encompassed a more comprehensive approach to measuring adjustment.

Conversely, there are studies that suggest behavioral predictors are not significantly related to later school success or these relations could not be determined. For example, Duncan and colleagues (2007) used data from 6 studies (including ECLS-K

through third grade) to examine problem behaviors, such as internalizing problems, externalizing problems, and social competence, in relation to academic performance. This study found that these variables did not significantly predict future academic performance. One potential hypothesis for the insignificant results is that internalizing problems may indeed coexist with high achievement (Luthar & Zigler, 1991).

There also are studies in which these relations could not be examined between internalizing problems and achievement. For example, La Paro and Pianta's (2000) meta-analysis of 70 studies, which was previously discussed, could not determine the effect size of behavioral predictors in relation to later achievement (e.g., first and second grade), as there were an insufficient number of independent samples (i.e., preschool and kindergarten) to analyze. Consequently, more studies need to be conducted to determine whether behavioral predictors, such as internalizing problems, are related to long-term achievement.

Although there is ambiguity about early internalizing problems in relation to later achievement, there are various studies that suggest youth who have internalizing issues in childhood are more likely to have behavioral adjustment concerns in the future. Research suggests stability of internalizing symptoms spanning from childhood into later developmental periods (e.g., onset of adulthood; Obradović et al., 2009), which supports the need for early identification of students with internalizing symptoms to target them for intervention efforts.

Another study found that young children (i.e., 4 years old) with internalizing behaviors were more likely to demonstrate these types of behaviors in middle childhood and early adolescence (10 and 14 years old, respectively; Bornstein et al., 2010).

Bornstein and colleagues' (2010) study consisted of a longitudinal sample with data from three time points including 118 European American families. Although the sample only included one ethnicity, the participants were diverse in terms of their educational and socioeconomic backgrounds. Some of this study's strengths were its 10-year longitudinal design and its inclusion of behavioral adjustment (i.e., internalizing, externalizing symptoms, and social competence). However, the study had some notable limitations, such as generalizability, omission of early internalizing behavioral data, and exclusion of academic constructs. Specifically, generalizability of the sample was limited as it was relatively homogenous (i.e., excluded other ethnicities/races) and was normative in terms of social competence and intensity of problems (i.e., the extreme end of the spectrum was not represented). In terms of informants, teacher data for internalizing symptoms were only collected at ages 10 and 14. Incorporating teachers as raters during early childhood for internalizing symptoms may help further assist in detection (Verhulst, Hans, Koot, & van der Ende, 1994).¹ Bornstein and colleagues' (2010) study also excluded academic competency as a construct due to researchers' concern about model complexity.

Early symptoms or disorders do not always result in later psychopathology. Some children have protective factors that result in better outcomes. These concepts of continuity and discontinuity, as well potential reasons for these various trajectories are discussed next.

¹ For instance, initial data suggest that teachers accurately identify 50% of students who self-report internalizing symptoms in the clinical range in later elementary school (i.e., fourth and fifth grade; Cunningham, 2012). Although a higher accuracy percentage would be ideal, the current study will also use parents as raters in attempt to more accurately identify children with internalizing problems.

Internalizing problems: Continuity versus discontinuity. As in other forms of psychopathology, there are various trajectories for children with early internalizing disorders. Vulnerabilities, such as internalizing issues, can begin during childhood or adolescence (Ingram & Luxton, 2005). Children who experience a concern with anxiety or depression are more likely to experience these respective issues in the future (e.g., Bornstein et al., 2010; Kovacs, 1996; Luby, Gaffrey, Tillman, April, & Belden, 2014; Swedo, Leonard, & Allen, 1994; Verhulst & Van Der Ende, 1992). Other studies also suggest continuity of disorders but with some notable complexities (e.g., Pihlakoski, Sourander, Aromaa, Rautava, Helenius, & Sillanpaa, 2006).

Pihlakoski and colleagues (2006) conducted a study of the continuity of problem behaviors in Finland. Initial data were gathered among preschool-aged children upon entry. Parent ratings for internalizing disorders showed continuity only for females from early childhood (i.e., 3 years old) into early adolescence (i.e., 12 years old). A potential reason for this finding is that parents may have difficulty identifying internalizing problems, especially among adolescent boys. Another major finding of this study was that young children with externalizing problems were at greater risk for internalizing problems during early adolescence. This finding demonstrates the concept of multifinality, as children with different starting points (e.g., externalizing problems in versus internalizing problems in early childhood) can have a similar outcome (i.e., internalizing issues) at a later point in time. This study's informants included parents and children, with the latter source reporting data for only the second time point. However, no teacher data were collected as part of this study.

Luby and colleagues (2014) recently conducted a longitudinal study within United States to also examine continuity of problem behaviors. Preschool depression was the primary variable of interest within this study, as well as its implications for long-term concerns. Within this study, the less stringent preschool depression criterion was utilized, in which the duration could be less than 2 weeks and only 4 of 5 symptoms of depression were required. Preschool children between the ages of 3 years and 5 years 11 months were recruited from childcare provider sites in Saint Louis, Missouri. The researchers purposely oversampled preschool children with depression. Even after controlling for maternal depression and gender, the logistic regression analyses revealed that preschool depression was significantly related to depression among school-aged students. Preschool age was positively associated with major depression at school-age, with older students having higher rates of major depression than younger students. Students with preschool depression also were more than two times more likely to meet diagnostic criterion for anxiety and ADHD.

Luby et al. (2014) has some parallels to Pihlakoski and colleagues' study (2006), as well as some unique limitations. Luby et al.'s study (2014) also supported multifinality, specifically externalizing problems (in this case Conduct Disorder) in preschool was significantly associated with school-aged depression. (As an aside, the relation between preschool Conduct Disorder and school-aged depression was partially mediated by nonresponsive parenting, but this will not be a focus of the current literature review.) This study also limited its informants to parent and child, with only the former for the first time point in preschool. It may also be helpful to obtain teacher's perspective in future research. Moreover, the study only included a relatively small sample from a

limited geographical area, which limits generalizability of the findings. Lastly, Luby et al. (2014) also set a certain threshold to be reached like the Pihlakoski et al. (2006) study for internalizing problems to be established. However, in future research it may be helpful to utilize continuous symptoms for internalizing symptoms rather than set certain cutoff points as a threshold to examine a range of students along a continuum. In spite of these limitations, Luby and colleagues' (2014) findings support the need for early detection and intervention efforts for depression.

Much of the extant research supports continuity of internalizing behaviors over time. Data support a curvilinear trend in internalizing issues, especially for depression, with adolescents and young adults presenting the highest level of symptoms, with lower rates among older senior citizens (Birmaher et al., 1996; Karel, 1997; Lewinsohn & Essau, 2002). Consequently, there is a need to examine internalizing issues from an early age in order to prevent the onset of potential ongoing mental health concerns.

Internalizing problems summary. Internalizing problems are common mental health issues that arise in youth that may have implications for short-term and long-term academic and behavioral adjustment. A child with internalizing behavior problems has overcontrolled behavior that is directed towards the individual (Merrell, 2008b). There are a number of risk factors associated with internalizing problems, such as home environment, genetics, temperament, and demographic factors (e.g., age and gender). Previous research studies also suggest a connection between internalizing behaviors and future behavior and mental health concerns. However, there is more ambiguity, especially younger children, in terms of the influence of internalizing problems on achievement. More research needs to be conducted to better understand these relations. Future research

can expand the literature by examining internalizing problems as both a predictor and an outcome, along with academic achievement and externalizing behaviors as predictors and outcomes.

Externalizing problems. Also of concern during early childhood are externalizing problem behaviors, especially conduct problems and attention issues. Three major childhood and adolescent externalizing behaviors, Conduct Disorder, Oppositional Defiant Disorder, and Attention-Deficit/Hyperactivity Disorder (ADHD), are outlined in the Diagnostic and Statistical Manual-5 (DSM-5; American Psychological Association (APA), 2013). In particular, a type of conduct problem, Oppositional Defiant Disorder (ODD) and Attention-Deficit/Hyperactivity Disorder (ADHD) are some of the most common childhood concerns with a prevalence rate of 3 to 18% (American Psychiatric Association, 1994; Kroes et al., 2001). Conduct problems include a range of aggressive, defiant, and antisocial behaviors, while attention issues consist of hyperactivity, impulsivity, and inattention (Essex et al., 2006, Hinshaw, 1992b, Xue et al., 2005). Comorbidity also is a consideration when examining externalizing disorders. Among children, about a 50% comorbidity has been found between conduct problems and Attention Deficit/Hyperactivity Disorder (ADHD; Kazdin & Johnson, 1994; Loeber & Keenan, 1994). While it is important to recognize comorbidity, this literature review will separately describe these two types of externalizing problems in terms of their prevalence, risk factors, and relation to short-term and long-term academic and behavioral outcomes.

Conduct problems. Although most children demonstrate aggressive behavior at some point, more extreme behavior (e.g., intensity and frequency) may indicate a conduct

problem (Frick, 1998). Two major clinical disorders, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) are outlined for conduct problems during childhood in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013). ODD includes emotional (anger and irritability) and behavioral outbursts (e.g., exhibiting defiant or hostile behavior towards authority figures; APA, 2013). Specifically, the DSM-5 defines the characteristics as, Angry/Irritable mood:

(1) often loses temper, (2) is often touchy or easily annoyed, (3) is often angry and resentful; argumentative/defiant behavior: (4) often argues with authority figures or, for children and adolescents, with adults, (5) often actively defies or refuses to comply with requests from authority figures or with rules, (6) often deliberately annoys others, (7) often blames others for his or her mistakes or misbehavior; vindictiveness, (8) has been spiteful or vindictive at least twice within the past 6 months (p. 462).

The DSM-5 requires that at least 4 of these symptoms are present for an ODD diagnosis for at least a 6 month period, during an interaction with at least one non sibling, and determine outliers based on varying intensities that correspond to the child's developmental stage, gender, age, and culture. Specifically, children who are younger than 5 years old should demonstrate ODD symptoms on most days for a period of at least 6 months, whereas children 5 year and older should exhibit ODD symptoms at least once a week for the same duration (i.e., 6 months). In terms of exclusionary criteria, the behaviors specified above do not only occur during a psychotic episode, substance use, or the course of depression or bipolar disorder. Moreover, the individual meeting the criteria

above for ODD is not better described by a disruptive mood dysregulation disorder (APA, 2013).

The other type of conduct problems is Conduct Disorder (CD), which is a more severe disorder wherein an individual persistently violates the rights of others or developmentally appropriate societal norms. The major characteristics of CD are: (1) aggressive conduct towards animals and/or humans, (2) nonaggressive conduct towards property, (3) deceit or theft, and (4) serious violation of rules (APA, 2013). Within these characteristics, there are different criteria, and if an individual demonstrates at least three of these fifteen behaviors in the last 12 months, with one occurring within the last 6 months, he or she is considered to meet criteria for this disorder. Individuals exhibit a wide range of behaviors, which makes CD a heterogeneous disorder. If an individual is 18 or older, then antisocial personality must be ruled out before making a Conduct Disorder diagnosis. Furthermore, it should be specified whether or not there are limited prosocial emotions, including a lack of remorse/guilt and being callous typically, persisting across 12 months, and across settings. In terms of Conduct Disorder, it should also be specified if the individual is not concerned about his or her performance in academics, work, or other important aspects of life regarding performance. Lastly, it should be noted for an individual being diagnosed with Conduct Disorder whether or not he or she presents with shallow and/or deficient affect, or in other words shows relatively little emotion or only exhibits emotions for different types of gain (APA, 2013). A range in current severity should be specified from mild to severe for both types of conduct problems (i.e., ODD and CD). For ODD and CD the DSM-5 also requires a

significant impairment in academic or social functioning or causing “distress in the individual or others in mediate social context” (APA, 2013, p. 462).

Prevalence rates in the United States for conduct problems vary, which may be partially attributed to risk factors and evaluation methods. The overall prevalence rate for conduct problems ranges between 2% and 16%, which varies based on population and measurement (Loeber et al., 2000; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004). Wolff and Ollendick (2010) also highlighted differences in prevalence rates of conduct problems based on factors, such as age and gender, with males more likely to be diagnosed with these problems than females once children reach preschool age.

Factors influencing conduct problems. There are a number of variables that are associated with conduct problems. Age of onset, gender, and socioeconomic status are some of the associated risk factors. In terms of age of onset, there is greater concern with an earlier age of onset. Practitioners should compare a child to standardized age norms to determine his or her level of intensity. Children who are diagnosed with externalizing symptoms (e.g., ODD, CD, and ADHD) early on are at-risk to demonstrate these types of problems over time (e.g., Loeber et al., 1993; Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002; Silver et al., 2005). One of the key predictors to receiving a diagnosis with Conduct Disorder before 10 years old is being diagnosed with ADHD (Lahey & Loeber, 1997). There is also evidence that suggests that children with comorbid ADHD and Conduct Disorder are at-risk to be persistent in their Conduct Disorder and be more aggressive over time (Hinshaw, Lahey, & Hart, 1993). Therefore, inclusion of diagnoses and symptoms of ADHD should serve as an important predictor within diagnostic models.

Another demographic feature that is a risk factor for conduct problems in youth is gender (Robins, 1991), although there are some variations over developmental periods. Beginning at preschool age, boys are consistently more likely to be labeled at different time points with externalizing problems (Keenan & Shaw, 1997; Moffitt, Caspi, Rutter, & Silva, 2001). Although there are few studies, extant data suggest relative stability of disruptive behaviors across both genders. For example, girls diagnosed in early childhood with disruptive behavior, such as aggression, are as likely as boys to maintain these problems (Tremblay, Masse, Perron, Le Blanc, Schwartzman, & Ledingham, 1992). During adolescence, a smaller discrepancy is found in conduct problems between males and females (APA, 2013). Some studies suggest there are no significant gender differences in oppositional behavior in later development. For example, Lahey and colleagues' (2000) study found no significant differences in oppositional behavior in a household survey of middle childhood through late adolescence (9-17 years old).

Another risk factor for conduct problems in youth is socioeconomic status. Children from low socioeconomic backgrounds are at greater risk than are youth from higher socioeconomic backgrounds for early onset conduct problems, as well as for deficits in social competence, or prosocial behavior (Farrington, 1991). Therefore, socioeconomic status should be considered as a potential risk factor for maladjustment, in addition to gender and early onset of externalizing problems.

Conduct problems: Academic and behavioral implications. Many children with externalizing issues are at-risk for negative short-term and long-term academic and behavioral outcomes. During preschool, it is estimated that about 20% of students have disruptive behaviors (Campbell, Shaw, & Gilliom, 2000), which places them at risk for

later school maladjustment. In terms of short-term implications, children with externalizing issues (e.g., opposition, defiance, and aggression) are more likely than youth without externalizing issues to experience difficulties adjusting to kindergarten (Coie & Jacobs, 1993; Reid, Eddy, Fetrow, & Stoolmiller, 1999). As reviewed earlier, adjustment to kindergarten has important implications for educational attitudes and behaviors, which are related to future attendance and academic performance (Alexander et al., 1997; Rush & Vitale, 1994).

There also are long-term academic and behavioral concerns for children exhibiting externalizing issues. In particular, children who have an earlier onset of significant behavioral issues are more likely have poorer academic and behavioral trajectories than if their onset was during adolescence (Ensminger & Slusarcick, 1992; Huesman et al., 1987; Kupersmidt & Coie, 1990; Miles & Stipek, 2006). For example, Huesman and colleagues (1987) conducted a 22-year longitudinal study with a sample in a northern rural area in the United States and found that higher rates of aggression in kindergarten were associated with lower levels of intelligence in both childhood and later adulthood. A potential hypothesis for this association between lower levels of intelligence and aggression in childhood and adulthood is fewer problem-solving strategies (e.g., communication and prosocial behavior) to resolve issues. However, a notable limitation of this study was only a small portion (i.e., 86) of the total sample size ($N = 632$) had an IQ score on record at 19 years old. Another limitation of this study was the generalizability of this study, which was limited as the sample was recruited from one, small geographical location. Lastly, directionality of the relations between intelligence and aggression cannot be established due to the correlational nature of this study.

Hooper and colleagues (2010) also examined the links between achievement and aggression. This study used two longitudinal data sets, the Early Child Study Longitudinal Study Kindergarten (ECLS-K) and National Institute of Child Health and Human Development's Study of Child Care and Youth Development (SECCYD), following students from elementary into secondary school on various behavioral variables. Hooper and colleagues used a subsample of these data sets' participants, including Caucasian and Black children. Hooper and colleagues (2010) found different findings for the behavioral variables across the two data sets. In the SECCYD, behavioral variables (e.g., aggressive behavior) were not related to later achievement in reading or math. However, within the ECLS-K data set, moderating effects were detected. Specifically, within the ECLS-K data set, a moderating effect was found for teacher ratings of early aggressive behavior among Black students in kindergarten in relation to math and reading achievement growth through eighth grade. Specifically, there was a negative relation found between aggression and achievement, with slower gains in reading and math among Black children who were rated as more aggressive. Hooper's study has notable limitations, such as only using sub populations of the data sets, limiting generalizability. Hooper and colleagues also only used academic outcomes and not behavioral ones (e.g., suspension).

There also are other long-term implications of externalizing problems for academic success. McLeod and Kaiser (2004), as previously mentioned, conducted a longitudinal study of children (i.e., 6 to 8 years old), and found that children with initial externalizing problems were significantly less likely to graduate from high school than their peers without these initial mental health concerns (McLeod & Kaiser, 2004).

Consequently, mental health appears to have implications for long-term academic success, which is associated with adjustment in adulthood (U.S. DHHS, 2000; U.S. Department of Labor, 1997).

Studies also suggest that externalizing issues in childhood are risk factors for future antisocial behavior in later childhood, adolescence, and adulthood (Broidy et al., 2003; Caspi, Elder, & Bem, 1987; Loeber, DeLamatre, Keenan, & Zhang, 1998; Loeber & Dishion, 1983; Loeber et al., 1993; Luby et al., 2014; Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002; Silver et al., 2005). Silver and colleagues (2005) found that students with conduct problems in kindergarten were more likely to demonstrate conduct problems in third grade than their kindergarten peers without these externalizing problems. Children who exhibit externalizing behaviors in early childhood (i.e., 4 years old) were less likely than peers without these early externalizing concerns to have prosocial behaviors in middle childhood (i.e., 11 years old; Hay & Pawlby, 2003). Data also suggest that individuals with conduct problems in youth are more likely than those without conduct problems to be diagnosed with more serious future behavioral concerns, such as Antisocial Personality Disorder in adulthood (Loeber, Burke, & Lahey, 2002), as well as internalizing problems (e.g., anxiety and depression) and substance abuse (Kim-Cohen, Caspi, Moffit, Harrington, & Poulton, 2003).

Overall, children who demonstrate conduct problems early on are at increased risk for criminal activity, substance abuse, and school dropout (Jones, Dodge, Foster, & Nix, 2002). If society is able to identify these children when young through screening, then early intervention can be provided. Subsequently, when a negative behavioral trajectory (e.g., incarceration, substance use, and/or dropout) is successfully altered, it can enhance

an individual's life, as well as prevent significant costs to society, which Cohen (1998) cited as at least \$1.7-2.3 million per one at-risk child.

Conduct problems: Continuity versus discontinuity. There is some controversy in the field regarding age of onset and projected trajectories for conduct problems. Loeber and colleagues (2000) provided a summary of related methodological issues. Some of the concerns for the distinction between projected trajectories for age of onset are: (1) oversimplification of measurement (i.e., presence or absence of CD symptoms; Loeber & Stouthamer-Loeber, 1998), (2) memory biases for recalling onset of symptoms (Angold & Costello, 1996), and (3) mismatch of trajectories for females.

Some of the differences in predicted trajectories also may relate to the concept of multifinality, in which individuals may initially have similar risk factors but have different mental health outcomes (Hinshaw, 2008). Therefore, although there is a higher likelihood of stability of future socially undesirable behavior, a negative trajectory is not decisively predicted by early externalizing concerns (Campbell, Shaw, & Gilliom, 2000; Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998). For example, although ODD in childhood is a significant predictor of CD (APA, 2013), only 40% of children with ODD go onto have diagnosis of CD (Lahey & Loeber, 1997).

Although there is a range of potential outcomes, it is still important to identify youth with conduct problems as some may be more at-risk for long-term adjustment issues. CD has two subtypes, which differ in their time of onset, childhood or adolescence. Individuals with an earlier diagnosis of CD are at an increased risk to demonstrate CD in the future or acquire a more severe diagnosis, such as Antisocial Personality Disorder in adulthood (Frick, Kimonis, Dandreaux, & Farrell, 2003; Loeber et

al., 2004; Moffitt & Caspi, 2001). Although it is beyond the scope of the current literature review, it should be noted that children who possess a callous trait are associated with worse long-term outcomes (e.g., psychopathy) than peers who lack this trait (Barry, Frick, DeShazo, McCoy, Ellis, & Loney, 2000; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005). Overall, efforts should be made to facilitate early identification to target prevention and intervention services to offset a potential negative trajectory.

Summary of conduct problems. Individuals with conduct problems have increased vulnerability in terms of their later outcomes. Individuals with externalizing problems demonstrate aggressive and inappropriate behaviors towards others and/or property. There a number of risk factors for conduct problems, including demographics (e.g., age of onset, gender, and socioeconomic status). Early age of onset of conduct problems is a risk factor for later related problems, although there is variation in terms of continuity and discontinuity, illustrating the phenomenon of multifinality. Prevalence rates of conduct problems are higher among children from lower socioeconomic backgrounds and among males than females during early childhood. Future research can expand upon the research by examining externalizing problems through a continuum and considering academic and behavioral outcomes in secondary school in tandem.

ADHD symptoms. Another common childhood diagnosis within externalizing problems is Attention Deficit/Hyperactivity Disorder (ADHD; Barkley, 2006). There are three major types of ADHD. These three major types: (1) Combined Presentation, (2) Predominantly Inattentive Presentation, and (3) Predominantly Hyperactive/Impulsive Presentation. In order to be diagnosed with ADHD, the individual needs to demonstrate at least 6 symptoms from either Presentation (i.e., Predominantly Inattentive Presentation

or Predominantly Hyperactive/Impulsive Presentation) for the past 6 months or for older adolescents and adults (age 17 and older) demonstrate at least 5 symptoms. In addition, the individual must meet other relevant criteria (i.e., demonstrate social and academic/occupational impairment across at least two settings, have onset of some symptoms before 12 years old, ADHD diagnosis is not better explained by another disorder (e.g., oppositional behavior, not understanding a task or instructions, anxiety disorder, mood disorder), and have symptoms inappropriate for developmental stage). For all three types severity should be noted, including mild, moderate, or severe in terms of academic, social, and/or occupational functioning. Also it should be specified if a person is in partial remission, which means an individual had previously qualified as having a form of ADHD but over the last 6 months currently falls below the designated symptom threshold but still is experiencing related impairments in social, academic, or occupational functioning.

For the Combined Presentation of ADHD, the individual must exhibit 6 symptoms from each presentation of ADHD or for older adolescents (i.e., age 17 and older) demonstrate at least 5 symptoms from each presentation. The DSM-5 (APA, 2013) specifies the features of ADHD Inattentive Presentation including: (1) making careless mistakes in schoolwork or other types of work, (2) difficulty maintaining attention in tasks or play activities, (3) not listening when directly spoken to, (4) failing to finish tasks or chores, (5) difficulty organizing tasks and activities, (6) reluctance, avoidance, or displeasure engaging in activities that require ongoing attention (e.g., homework), (7) often losing necessary materials for activities (e.g., homework), (8) being easily distracted by surroundings, and (9) being forgetful in daily activities. Within

Hyperactive-Impulsivity Presentation the characteristics are: (1) fidgeting or tapping, (2) difficulty remaining in seat when expected, (3) often running or climbing when inappropriate, (4) difficulty playing quietly, (5) frequently moving around, (6) excessive talking, (7) talking excessively, (8) calling out answers before the question fully given, (9) trouble waiting turn, and (10) interrupting or intruding on others (e.g., conversations or games).

Prevalence rates of school-age children with an ADHD diagnosis in the United States range from 3 to 7%, with an average of 7.2% among children at some point during their youth (APA 2013; Akinbami, Liu, Pastor, & Reuben, 2011). However, there are mixed data on whether ADHD is overdiagnosed (Bruchmuller, Margraf, & Schneider, 2011; Desgranges & Karsky, 1995) or underidentified (Brock, Jimerson, & Hansen, 2009).

A recent study by Bruchmuller and colleagues (2011) suggested there may be an overdiagnosis of ADHD. Within this study, researchers used an experimental design in which they manipulated ADHD vignette components (e.g., gender and elements required for diagnostic criteria). One version of the vignette was sent to 1000 professionals, including psychologists, psychiatrists, and social workers. When vignettes were missing necessary criteria to meet a diagnosis of ADHD, 16.7% of professionals still diagnosed these individuals with ADHD, and therefore, these decisions were considered to be false positives. There also was a significant finding for gender, with therapists twice more likely to diagnose males with ADHD than females, although the only difference in vignettes across the raters was gender. There were some notable limitations of this study. One limitation was that generalizability may be restricted, as this study was conducted in

Germany, and consequently these vignettes and related materials were in German. There was also a research design limitation as individuals were only assigned to one vignette, which helps limit practice effects but prevents interindividual comparisons in diagnoses.

There also are research studies that suggest that there is a higher prevalence of ADHD symptoms, which do not necessarily meet the full criterion for a diagnosis. For example, within the school setting, teachers consider 16.1% of their students to demonstrate ADHD symptoms (Wolraich, Hannah, Baumgaertl, & Feurer, 1998), which is more than double than overall youth prevalence of the diagnosis of ADHD, 7.8% (National Center on Birth Defects and Developmental Disabilities, 2005 as cited in Boyle et al., 2011). However, there are some important diagnostic issues, including symptoms and impairment and relations between these aspects of diagnosis that should be considered.

Researchers are working to understand symptoms and impairment, as well as the relations between them. A consideration for practitioners assessing ADHD is the child's impairment, as it needs to be present in order to qualify for an ADHD diagnosis under the DSM-5 criteria. As previously indicated, children must demonstrate significant clinical impairment in two or more settings (APA, 2013). There is ambiguity in terms of what operationally constitutes academic and social impairment at home and school in terms of DSM-5 criteria of disorders. Consequently, practitioners need to use their best clinical judgment. Gordon and colleagues (2006) found that the impairment inclusion drastically reduced diagnosis by 77%, meaning that only 23% still qualified for an ADHD diagnosis. Another impairment related issue is the relation between symptoms and impairment. Gordon and colleagues (2006) also found that the number of symptoms and intensity only

accounted for 10% of the variance for impairment, which means that a child experiencing many symptoms often is not the one facing the most impairment. Based on this data, the current literature review discusses ADHD symptoms rather than diagnoses in order to address a wider spectrum of attention issues.

ADHD and comorbidity will be briefly reviewed here, as the issue of comorbidity has been discussed throughout this chapter. The two major comorbid considerations are across disorder types (i.e., co-occurrence of externalizing and internalizing disorders) and within externalizing disorders (e.g., conduct disorders and ADHD). Research suggests that comorbidity of ADHD and mood disorders (e.g., MDD) among children and adolescents in clinical and epidemiological samples ranges from 15% to 75% (Biederman, Newcorn, & Sprich, 1991). Specifically, Biederman and colleagues' (1991) study suggested that there was approximately a 25% comorbidity rate between ADHD and anxiety disorders. Within externalizing disorders, Biederman and colleagues (1991) also reported a comorbidity rate of 30 to 50% in epidemiological and clinical populations. Children with conduct disorder and comorbid ADHD are at increased risk for mental health concerns in adulthood (e.g., higher rates of diagnosis of Antisocial Personality Disorder), which may partially account for a likelihood of a worse progression over time than their counterparts with only ADHD (Biederman, Newcorn, & Sprich, 1991). Research suggests that even in early childhood, these individuals demonstrate a similar pattern of ADHD tendencies with comorbid conditions that is found among older peers (i.e., school age children; Wilens et al., 2002).

There are several developmental considerations for ADHD. From the ages of four to five, the American Academy of Pediatrics recommends using behavioral interventions

as the first intervention approach and medication should only be considered if there are not significant improvements after implementation of behavioral strategies. Additionally, the Academy of American Pediatrics (2011) also recommends at least moderate impairment in functioning for medication to be considered (Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management, 2011). It is noteworthy that there is a paucity of research in terms of the side effects and interactions among pharmaceutical drugs among young children.

Therefore, it is important to identify children at an early age with ADHD symptoms to be able to determine these children who may be at an increased risk for negative outcomes and to provide evidence-based behavioral support. Extant studies empirically support multimodal treatment among school-age children (i.e., behavioral and medication intervention; Jensen et al., 2001). However, many youth continue to experience ADHD symptoms, facing more adjustment issues than counterparts without ADHD (e.g., diminished school success; lower rates of high school graduation; Smith, Barkley, & Shapiro, 2006).

The following sections will delineate risk factors and protective factors for ADHD symptoms and implications of these symptoms on functioning. Certain groups and individuals are more at-risk for demonstrating ADHD symptoms and impairment, while others may have protective factors in place that help offset the impact of ADHD symptoms on the different domains of functioning (e.g., educational and emotional). These topics will be explored under the factors influencing ADHD symptoms section. ADHD symptoms have been linked with various types of academic, behavioral, and mental health adjustment that will be discussed below. Although there is some

inconsistency in the literature, it appears that ADHD symptoms seem to persist into adulthood, which suggests continuity in terms of an individual's trajectory.

Factors influencing ADHD. ADHD risk factors include genetics, home environment, and demographic factors (e.g., parental education, child's age, and child's gender). Children with immediate relatives with ADHD increased the risk also being diagnosed with ADHD by 2 to 4 times (Beauchaine & Hinshaw, 2008). Genetics and home environment (e.g., due to exposure to a chaotic household) appear to both be important risk factors for ADHD (Beauchaine & Hinshaw, 2008). Another risk factor is parental education. Sauver and colleagues (2004) found among a population-based sample of children who were born in the same county within Minnesota between 1976 and 1982 that parental education was negatively associated with children's ADHD symptoms. Therefore, children whose parents (mother and father) had higher levels of education were at a decreased risk for an ADHD diagnosis. Conversely, children with parents with lower levels of education were at greater risk for being diagnosed with ADHD, which was more prevalent among male children.

Various studies have found gender differences in ADHD symptoms and diagnosis. Matthews and colleagues (2009) found that kindergarten girls had higher levels of self-regulation than boys and that there were more boys with the lowest self-regulation scores, which corresponds with ADHD symptoms (Matthews, Ponitz, & Morrison, 2009). Overall, prevalence rates suggest that 11% of males are diagnosed with ADHD in comparison to 4.4% of females (Visser, Lesene, & Perou, 2007). However, a recent study using vignettes suggests there may be potential gender biases for an ADHD diagnosis, as males were twice more likely to be diagnosed than females were, even

though the only variable manipulated within these vignettes was gender of the child (Bruchmuller et al., 2011).

Another potential risk factor for a child with ADHD symptoms is a deficit in prosocial behavior. Children in kindergarten with ADHD were found to be lacking prosocial behavior, particularly in social cooperation, including meeting social expectations of peers and teachers (Wolfe & Merrell, 1998). In fact, children were five times more likely to have social deficits in relation to their matched comparison peers (i.e., those without ADHD diagnosis). Moreover, McConaughy and colleagues (2011) conducted a study of 6-11 year old children, sampled from 3 northeastern states, and those with ADHD had significantly more clinically significant academic and social concerns than their peers without ADHD.

There are some protective factors that may offset the potential negative implications of ADHD symptoms. These types of protective factors, called secondary protective factors, include: better reading skills, lack of aggressive behavior, and positive peer relationships (Barkley, 2006). For example, when boys with ADHD were not aggressive, they were more likely to be ranked more favorably in peer nominations for social preferences (Hinshaw & Melnick, 1995). Consequently, inclusion of academic skills and prosocial behavior may be helpful in determining where to address skill or performance deficits.

ADHD: Academic and behavioral implications. ADHD symptoms appear to be related to academic and behavioral adjustment in childhood, adolescence, and adulthood. One study found that most parents (i.e., 84%) with children with an ADHD diagnosis perceived a negative influence on their children's academic and social functioning within

school (LeFever, Villers, Morrow, & Vaughn, 2002). Another study, in which teachers served as raters for children with an ADHD diagnosis, found that about 50% of the teachers reported that these children experience academic or behavioral impairments (Wolraich et al., 1998). Educational data also indicated that children with ADHD often encounter academic difficulties, with 30 to 40% of children diagnosed with ADHD attending special education classes (Smith et al., 2006). Moreover, alarmingly almost a third of students with ADHD failed to complete high school (Smith et al., 2006).

One of the common areas of weakness found among children diagnosed ADHD or symptoms is self-regulation. A child with difficulty with self-regulation may struggle to remain in his seat and be more likely to experience work completion issues (Raggi & Chronis, 2006). Overall, lack of self-regulation can have negative implications for these students, as studies suggest that self-regulation is an important predictor of academic success in early childhood and beyond. For example, Agostin and Bain (1997) conducted a short-term longitudinal study that found that a teacher's rating on a child's self-control (i.e., the subscale of the SSRS; Gresham & Elliot, 1990) at the end of kindergarten was associated with the child's academic success in first grade. In the Agostin and Bain (1997) study, academic success was operationalized by academic achievement and grade promotion. The study was conducted in the Southeast across three elementary schools with a predominantly Black sample, although there also was quarter of Caucasian participants. As indicated earlier a difference in this study was that the SSRS was administered during the end of the kindergarten school year, whereas the current researcher wants to assess children earlier in the school year to determine these skills closer to school entry.

Another recent study's results suggest better academic scores among students with higher levels of self-regulation (McClelland et al., 2007). McClelland and colleagues' (2007) study was conducted among a diverse sample that found that prekindergarten students with higher levels of self-regulation performed better in several academic areas (literacy, vocabulary, and math) over the course of that academic year. Since the participants were taken from two different geographic regions, Midwest and Northwest, with a diverse sample included, generalizability may have been enhanced to some degree.

Conversely, difficulties with attention are associated with negative long-term academic implications. Morgan and colleagues' study (2008) examined the bidirectional relations between problem behaviors and achievement. This study found that students with attention problems in first grade were more likely to experience reading problems in third grade, even once several socio-demographic variables were considered within a hierarchical linear model (HLM). Consequently, attention appears to be a central screener component for at-risk youth.

However, it should be noted that there is some ambiguity found within the research for ADHD in respect to academic implications. Consequently, this section will also examine some of the instances in which attention or ADHD was not a significant predictor of these outcomes. For example, Hooper and colleagues (2010) used only a selection of participants from two separate studies, the Early Childhood Longitudinal Study (ECLS-K) and National Institute of Child Health and Human Development's Study of Child Care and Youth Development (SECCYD). Specifically, the two subsets of children selected were Caucasian and Black children. In terms of the first data set, the

results within the ECLS-K indicated that attention in kindergarten was positively associated with subsequent reading and math achievement. However, using data from the second data set, SECCYD, these authors found no significant relation between attention and later academic achievement. Future studies should utilize the ECLS-K data set, with inclusion of all ethnic and racial categories of children, in order to help generalize findings. Moreover, future research should examine attention using a broader conceptualization of externalizing problems, based on the strong associations between ADHD and externalizing problems (Pratt, Cullen, Blevins, Daigle, & Unnever, 2002).

Overall, there are several reasons why early identification of ADHD symptoms should be targeted. One study found that children were performing at least two levels below their current grade placement by 11 years old if the child was diagnosed with ADHD (Cantwell & Baker, 1992). Children with ADHD do not tend to struggle in one academic area per se but rather may struggle across a range of subjects (DuPaul & Stoner, 2002). Moreover, previous research suggests that even subclinical levels of ADHD symptoms are associated with difficulties in school outcomes (Bussing, Mason, Bell, Porter, & Garvan, 2010).

There also are research studies that suggest has ADHD can have long-term negative academic implications. As previously indicated, there is a high rate of non-completion rates for high school among children with ADHD (Smith et al., 2006). In addition, Bussing and colleagues (2010) examined long-term implications of a childhood diagnosis of ADHD. In particular, this study featured a comparison of academic outcomes across adolescents, those diagnosed with ADHD in childhood, those who had subthreshold symptoms in childhood, or those were in a comparison low-risk group in

childhood. A random sample was derived from public school records in a North Florida school district ranging from kindergarten through fifth grade. The study found that adolescents who had been diagnosed with childhood ADHD or sub-threshold symptoms were more likely than students in the low-risk group to receive additional assistance for learning disabilities, be retained, as well as have lower grade point averages and standardized achievement scores in math and reading.

Moreover, Rapport and colleagues (1999) also conceptualized ADHD on a continuous scale. Bidirectional relations were examined between ADHD and other variables in relation to academic achievement. This study's sample was derived from a public and a private school in a Hawaiian school district ranging from second through ninth grade and employed a cross-sectional, longitudinal design. Specifically, Rapport and colleagues examined different models using Structural Equation Model (SEM) to examine the relations between ADHD and CD (both using the Teacher Report Form (TRF); Achenbach et al., 1987), as well as between ADHD and IQ (Kaufman Brief Intelligence Test; K-BIT; Kaufman & Kaufman, 1990), in connection to academic achievement (i.e., Stanford Achievement Test (SAT) over time (i.e., 4 years). ADHD symptoms had a moderate, negative relation with later academic achievement. Mediating relations were also found, with cognitive abilities serving as a mediator between ADHD and later achievement. Some limitations of the study were the relatively small, local sample and that the behavioral measures were collected from teachers. Additionally, only academic outcomes were examined within the study. Overall, these two studies (Bussing et al., 2010; Rapport et al., 1999) suggest that it may be beneficial for future research to

measure ADHD based on a continuum of ADHD symptoms rather than based on meeting cutoff scores for an ADHD diagnosis.

Although more research has been done among males, some ADHD studies have been conducted among females. A study of females found that regardless of ADHD diagnosis, deficits in early/middle childhood attention (specifically executive function) were related to lower levels of academic achievement in early adolescence (Miller & Hinshaw, 2010). Consequently, females with attention issues are also facing negative long-term academic implications. A major strength of this study was incorporating different sources of data, including parents and teacher, as well as including a continuum of attention range, whereas a limitation of this study was only including females; therefore, generalizability is limited.

Moreover, some preliminary evidence suggests that early attention problems are related to achievement in reading and math in secondary school even when early internalizing and externalizing symptoms were already factored into the model (e.g., high school; Breslau et al., 2009). This study had several strengths, including determining the correlations between teacher-reported problem behaviors in early elementary school using the Teacher Report Form from the Achenbach System of Empirically Based Assessment (ASEBA). Breslau and colleagues found the strongest positive correlation in early elementary school between externalizing and attention problems ($r = .62$), which was followed in strength by the relation between attention and internalizing problems ($r = .49$). The weakest relation was between the problem behaviors of externalizing and internalizing problems ($r = .37$). However, there were limitations, such as teachers served

as the only reporter of problem behaviors in early elementary school. Furthermore, the study was limited to one geographical area.

ADHD symptoms, including self-regulation issues, can also have negative behavioral implications. Children who are more prone to demonstrate hyperactive/impulsive tendencies (e.g., more frequent calling out, playing loudly, and getting out of their chairs) often experience negative behavioral consequences, such as office discipline referrals, also called problem behavior referrals (Mash & Barkley, 2003). In a study about hyperactivity among male children in early childhood, there was continuation of this concern into late adolescence, as well as an association with antisocial problems and difficulties in peer relationships, even once conduct problems were simultaneously considered within the multiple stepwise regression models (Taylor, Chadwick, Heptinstall, & Danckaerts, 1996). The study that followed females from early/middle childhood into early/late adolescence also found that females with executive function difficulties struggled in their social functioning, and females who were diagnosed with ADHD experienced difficulty in their global functioning (Miller & Hinshaw, 2010). Some youth that may be particularly vulnerable to negative mental health outcomes as adults (e.g., Antisocial Personality Disorder), are those diagnosed with ADHD and comorbid disruptive disorders, such as Oppositional Defiant Disorder (ODD; (Biederman et al., 1991). Future research should examine whether ADHD symptoms in early childhood are related to a range of outcomes (i.e., academic, behavioral, and mental health outcomes) in adolescence.

ADHD symptoms: Continuity versus discontinuity. Much of the extant literature supports the continuity of ADHD symptoms over time. Lavigne and colleagues' (1998)

findings suggested that many children initially diagnosed in preschool with ADHD still met criteria for the diagnosis after a range of 1 to 3 years. Additionally, at least 50% of children who demonstrated ADHD symptoms when they were only preschool-age were still symptomatic when they reached adolescence (Barkley, 1998). Similarly, Bussing and colleagues' (2010) findings suggest persistence of ADHD symptoms, with 44% of children who were initially diagnosed at five through eleven years old continuing to meet criteria or subthreshold levels of ADHD 7 years later (Bussing et al., 2010). Although there is a range, the estimate is from 36% to 65% of these youth maintain ADHD symptoms into adolescence and adulthood (Barkley, 1998, Kessler, Adler, et al., 2005; Nigg, Wilcutt, Doyle, & Sonuga-Barke, 2005). Continuity also is suggested by adult prevalence rates, with ADHD prevalence rates of more than 4% within the United States (Kessler et al., 2006). There is some research that suggests that inattentiveness, one of the most impairing aspects of ADHD, tends to have the most longevity (Biederman, Mick, & Faraone, 2000). Although the manifestation of symptoms of ADHD may be less salient over time, adolescents and adults are still likely to experience some degree of impairment in academic, social, and/or occupational domains (Biederman et al., 2000).

Summary of ADHD symptoms. ADHD is one of the most common pediatric disorders in modern society. When ADHD symptoms are required across at least 2 settings and impairment is included as criterion, as required by the DSM-IV, research studies have found a significant reduction in prevalence rates (Gordon et al., 2006). Consequently, there is controversy looming over whether ADHD is under or overdiagnosed. It should be noted that a significant portion of ADHD research has focused on males with ADHD symptoms and diagnoses. Future research is needed to

expand the literature through providing a larger sample with more equal gender representation. Moreover, an emphasis on ADHD symptomatology rather than diagnosis should prove helpful as even subthreshold ADHD symptoms in early childhood have been associated with later significant impairments in adolescence (Bussing et al., 2010).

Potential Covariates and Moderators

It is important to recognize not only the relations of the predictor variables in the current study may have with the outcome measures but to also recognize possible covariates and moderators. The next section of the literature review will briefly highlight some of these variables. Child/family characteristics include variables such as demographics in kindergarten (e.g., gender and socio-economic status) and early academic variables (e.g., academic performance on reading, math, and retention). The moderators were chosen from kindergarten, as the researcher wanted to examine potential resiliency factors that were present initially. Also another demographic variable, race (e.g., Black) was considered in terms of mean level differences and as a potential moderator between another variable (e.g., risk factor, such as teacher-reported early externalizing behavior) and behavioral outcomes (e.g., suspension). Overall, these early demographic variables may serve as moderators between early behavioral variables and academic outcomes, or between early behavioral variables and later behavioral outcomes.

There are many studies that support consideration of background variables. There is research that suggests that children from low SES backgrounds and low parental education, as well as boys, are more at-risk for early academic difficulties (Farkas & Hibel, 2008). Another study found low parental education, low family SES, and neighborhood conditions to be risk factors for early academic performance deficits upon

school entry (Duncan & Magnuson, 2005). Moreover, students whose family had several socioeconomic risks (e.g., low parental education and income) were more vulnerable to negative academic and social adjustment in first grade (Hair, Halle, Terry-Humen, Lavelle, & Calkin, 2006). Maternal characteristics, such as low maternal education, differentiate trajectories of persistent and declining aggression in male youth from kindergarten into high school, with lower socioeconomic status more associated with greater maladjustment (Nagin & Tremblay, 2001).

Some preliminary research is ambiguous in terms of the findings on background variables as moderators. For example, Skiba and colleagues (2002) found that Black males had the most suspensions compared to peers. However, Raffaele Mendez and colleagues (2002) found that Black females had the most suspensions compared to Caucasian peers. The current study explored Black race as a moderator between gender and suspension (i.e., presence or absence) based on these previous studies. With the exception of the suspension outcome between gender and race, which was between demographics and demographics, and for externalizing symptoms between SES and gender, the other moderators were between demographics and early risk or resiliency factors.

However, there are instances in which extraneous variables do not seem to influence the relations between predictors and outcomes. For example, Bussing and colleagues (2010) found that demographic variables, gender, race, or poverty did not serve as moderators between childhood ADHD symptoms and adolescent outcomes. Although there are mixed results in the literature in terms of extraneous variables, as a researcher it is important to control for these variables to determine whether there are

systematic differences in the data to determine potentially vulnerable and resilient populations.

Summary of Predictors

Extant research suggests that early screening efforts should assess risk and resiliency academically and behaviorally. This literature review has examined potential resiliency factors, such as early school-related emotional adjustment, prosocial behaviors, and early academic performance, in addition to potential risk factors, such as internalizing symptoms (i.e., depression and anxiety) and externalizing symptoms (conduct problems and ADHD). Few studies have examined academic and behavioral variables as both predictors and outcomes simultaneously, and this approach could present a more comprehensive perspective on adjustment. Consequently, less is known about which early behavioral and academic variables are most important in terms of secondary outcomes. Future researchers can work to close this knowledge gap. The next section will examine outcomes that research studies suggest are important considerations for an individual's adjustment in secondary school.

Secondary School Outcomes

When researchers examine outcome variables, there are many possible student outcomes that can be considered. The current study included academic and behavioral outcomes: academic performance (e.g., grades, standardized test scores, and retention status as of eight grade) and behavioral outcomes (e.g., presence or absence of suspension, diagnosis and symptoms of problem behaviors). Since the focus of the current research study was on early childhood predictors, the following sections below will briefly discuss each of these variables and provide a brief rationale for their inclusion. In particular, these secondary school outcomes will be examined in relation to

their potential implications for an individual's future academic, behavioral, and mental health functioning.

Academic performance. Monitoring individuals in middle school may inform practitioners and researchers of their potential trajectory. An emphasis has been placed on ninth-grade predictors of future success (Hickman et al., 2008); however, assessing outcomes in eighth-grade, prior to the high school transition, may be helpful in allocating additional resources to these at-risk students (Lan & Lanthier, 2003). Research on the Early Warning System (EWS) suggests that eighth-grade performance is related to future academic performance (Jerald, 2006). For example, a study of urban public schools in Philadelphia found that attendance in eighth grade was a key variable, as more than 75% of students who attended school less than 80% of time (i.e., missed 5 weeks of school) were at-risk for a negative academic trajectory (e.g., dropout). In addition, the same study found that whether a student received an F in math or reading in eighth grade was a highly predictive risk factor for grade retention (Neild & Balfanz, 2006). Another study found that even after controlling for demographic variables, academic performance in secondary school (i.e., grades and standardized test scores) predicted students' school maladjustment trajectories (Rumberger, 1995). These studies show that it is important to focus on academic performance, because academic failure is related to maladaptive outcomes (e.g., incarceration; Archwamety & Katsiyannis, 2000; Malmgren & Leone, 2000), which are economically detrimental to society as a whole (U.S. Department of Health and Human Services (DHHS), 2000).

Behavioral adjustment. Much of the extant research focuses on academic outcomes; however, behavioral adjustment also should be considered. For example, a

student who is demonstrating significant defiance and/or experiencing depression may have impaired functioning (e.g., academic and social-emotional), as various studies over time have found relations between academics and behavior (Glueck & Glueck, 1940; Meltzer et al., 1984).

School discipline. Suspension and office disciplinary referrals also should be considered due to their associations with later outcomes. There are findings that suggest that less than 10% (i.e., between 5-9%) of elementary and middle school students are responsible for more than half of office disciplinary referrals and the most serious infractions that occur (e.g., damaging property and hurting others; Skiba, Peterson, & Williams, 1997; Sugai, Sprague, Horner, & Walker, 2000). Moreover, youth who received more office disciplinary referrals (i.e., more than 10 ODRs within one school year) have a higher likelihood for maladjustment (including but not limited to school failure, substance abuse, and delinquency) than students under this threshold of ODRs (Walker, Colvin, & Ramsey, 1995).

There are also research studies that suggest students with frequent inappropriate school behavior are more likely to generalize these delinquent behaviors into their communities (Loeber & Farrington, 1998). Moreover, Sprague and colleagues' (2001) investigated the relations between school behavior (e.g., office disciplinary referrals) and delinquency in the community across the transition from primary into secondary school. This study found that there was a moderate correlation between severity of offenses within the community and the frequency of incidents within secondary school. About a third of the 44 students within the study were labeled as "early starters," which was defined as a first criminal offense before age 12, again highlighting the need for early

detection and intervention services for at-risk youth. A limitation of this study was a relatively small sample, which excluded youth with social emotional disturbances and was drawn from one county in the Northwest. Overall, these studies suggest that office disciplinary referrals seem to be useful data to monitor to determine improvements, especially among more consistent offenders.

A recent study conducted by Wright and colleagues (2014) examined what predicted suspension as an outcome. These researchers used archival data, specifically the ECLS-K, to investigate these relations. In particular, the aims of the study were to examine if there was a discrepancy between Caucasian and Black students in suspension rates and if so whether additional variables may account for these differences. Wright et al. (2014) found that Black students had significantly higher suspension average rate than Caucasian students, while controlling for socioeconomic status. However, a major emphasis of this article was that early problem behaviors largely accounted for the difference between the two racial groups. One of the limitations of this study was that teachers rated problem behavior so there may be potential biases that were not considered (Kaufman, Jaser, Vaughan, Reynolds, Di Donato, Bernard, et al., 2010). Another limitation was that parents reported suspension rate, and there may be some who were unaware or did not want to report this information. This study also excluded other races, as well as private schools and their students. Future research can include more racial groups, private schools, and their students, as well control for academic variables.

Problem behaviors. Early adolescence is an important time to examine mental health or problem behaviors. About one in five students, ranging from ages 9-17, have mental health disorders (U.S. Department of Health and Human Services, 1999). It is

crucial to consider these concerns due to implications for academic performance and long-term mental health outcomes (Kessler et al., 2005). In particular, there is more vulnerability of having lifelong mental health issues when diagnosed before the age of 14 years old (Kessler et al., 2005). There are also associations between early school mental health issues and academic performance in secondary school (Breslau, Miller, Breslau, Bohnert, Lucia, & Schweitzer, 2009; McLeod & Kaiser, 2004). The potential long-term trajectory of elementary school students' mental health outcomes and associated risk of negative academic implications in secondary school suggest the need for early universal screening efforts. The following brief review will examine outcomes in middle school that are key as they relate to later outcomes in high school and even later on in adulthood.

Internalizing behaviors. Internalizing behaviors in early adolescence appear to have implications for later adjustment. If youth are diagnosed with internalizing disorders during the developmental period of early adolescence, they are at greater risk to experience these issues in adulthood than youth without internalizing disorders (Colman, Wadsworth, Croudace, & Jones, 2007). Moreover, youth are more vulnerable when they are facing multiple risk factors on top of internalizing concerns, such as comorbidity (e.g., externalizing disorders) and/or depression within family history (Hammen & Rudolph, 2003). Adolescents with mental health issues such as anxiety disorders frequently report not enjoying school (Van Amergingen, Mancini, & Faryolden, 2003) and often experience academic concerns (e.g., lower academic achievement; Carroll, Maughan, Goodman, & Meltzer, 2005; Rutter, Tizard, Yule, Graham, & Whitmore, 1976). It should be noted that there is ambiguity of the directionality of internalizing

problems and academic concerns; consequently, the two aforementioned constructs can be used as both predictors and outcomes (Merrell, 2008a; Merrell 2008b; Seeley et al., 2002). Also there can be long-term potential barriers to employment; at the time of reporting 7 million people over the age of 15 were not working due to internalizing disorders, such as anxiety and/or depression (U.S. Census Bureau, 2008). Future research examining internalizing behavior in early adolescence can expand the literature, as fewer studies have determined risk factors for internalizing behavior than for externalizing behavior (Ashford, Smit, van Lier, Cuijpers, & Koot, 2008).

Externalizing behaviors. The next sections will examine externalizing behaviors within secondary school that are outward problem behaviors, which are also referred to as disruptive behavior disorders. Disruptive behaviors are generally associated with negative outcomes (Loeber & Farrington, 1998; Sprague et al., 2001), including low academic achievement and delinquency. It may be helpful to more frequently monitor and provide additional support to these vulnerable students. Specifically, the implications of conduct problems, including ODD and Conduct Disorder, as well as ADHD symptoms/diagnosis, will be outlined.

Conduct problems in secondary school. Conduct problems in secondary school appear to be related to future academic and behavioral outcomes. For example, an extensive, longitudinal study measured outcomes of a national cohort (born in a certain week in March 1946 in England, Wales, or Scotland) with mild or severe externalizing behavior from adolescence into mid-adulthood (i.e., age 13 to 53; Colman, Murray, Abbott, Maughan, Kuh, Croudace, & Jones, 2009). This study found that individuals with the most severe externalizing problems in adolescence (i.e., 40.1% in the top quarter)

went onto to have the most intense global adversity composite score (i.e., educational, financial, relationship, and mental health concerns) in comparison to individuals with no or mild externalizing problems. The study also found that 28.3% of individuals with mild externalizing problems in adolescence experienced an intense global adversity composite score, whereas only 17% of individuals with no externalizing issues in adolescence experienced significant global adversity scores in adulthood. A limitation of the study was attrition (68% overall), as most students dropping out of the study were derived from the most severe externalizing behavior groups. Another limitation was that only teachers rated students' externalizing behaviors. Moreover, in this study little was known about externalizing concerns prior to adolescence (i.e., during early childhood). Overall, this study suggested that conduct problems are associated with long-term implications.

Moreover, another longitudinal study found associations between conduct problems during youth and adulthood. Parent and teacher ratings of child conduct problems during early and middle childhood predicted mental health and criminal behaviors 25 years later for both females and males, even after demographic (e.g., economic disadvantage) and individual factors (e.g., intelligence and attentional problems) were factored into the model (Fergusson, Horwood, & Ridder, 2005). This study was conducted in New Zealand, which may limit generalizability to the United States. Future research should be conducted to study the long-term implications of conduct problems in conjunction with other mental health problems.

ADHD symptoms/diagnosis. Research suggests the continuity of ADHD symptoms and impairment over time. Loe and Feldman's (2007) review found that youth diagnosed with ADHD are more likely to have lower achievement (i.e., grades and

standardized test scores) and more behavioral concerns (e.g., ODRs) than peers without an ADHD diagnosis. Another study found negative implications for young adults who had been diagnosed during their childhoods as hyperactive, as they were more likely to have earned worse grades than peers without a diagnosis, been enrolled in Special Education services, and faced disciplinary action (Barkley, Fischer, Smallish, & Fletcher, 2006). Due to the potential long-term implications of ADHD symptoms and diagnoses, it is important to support early detection efforts.

Screeners

Overall, there is a need to identify students who are at-risk for learning, behavioral, or socio-emotional issues early in their schooling, which can be facilitated through screening efforts. School psychologists, teachers, and other school staff may administer a variety of screeners to evaluate development and school readiness in kindergarten (Gredler, 2004). There are different methods for screening, such as developmental or school readiness measures, as well as teacher and parent rating scales. Rather than evaluating specific, existing skill sets, developmental screeners examine the extent to which a child is likely to acquire skills (Meisels, 1994). For example, developmental screeners may feature: motor coordination, language comprehension, and socio-emotional functioning measures (Lichenstein & Ireton, 1991; Meisels, 1994). There are also school readiness screening measures, which may include: motor, language, and cognitive skills (Lichenstein & Ireton, 1991). Lichenstein and Ireton (1991) highlight that there can be content overlap in these two types of screeners and consequent ambiguity in deciphering between them. Both forms of screeners can be helpful in identifying students who may be at-risk.

There are some quality screening tools for socio-emotional functioning in the field. A commonly used socio-emotional screening tool is the Screening for Behavior Disorders (SSBD). The SSBD is a multiple gating system validated with preschool through secondary school populations (Caldarella, Young, Richardson, Young, & Young, 2008; Lane, Wehby, Robertson, & Rogers, 2007). The SSBD uses a filtering system of multiple steps to determine at-risk students (Merrell, 2008). Within this system, there are typically three steps or gates (teacher nominations, Likert rating scales, and observations); however, there is also a fourth gate of school archival records. School archival records can also be used as standalone method. School archival records typically include attendance data and disciplinary records. The SSBD is considered the standard for systematic screening (Kauffman, 2001), as it accurately identifies 85-90% of students with internalizing or externalizing disorders (Walker & Severson, 1992).

However, there are limitations related to socio-emotional screening. Kauffman (1999) noted a major issue is that frequently schools do not use this type of proactive system, which predicts future serious behavioral and emotional issues rather than necessarily identify current disorders. One study found less than 2% of schools systematically screen for these social, emotional, and behavioral concerns (Romer & McIntosh, 2005). Some of the resistance for using systems like the SSBD may stem from concerns about stigmatizing students, concerns of insufficient resources to address students identified as at-risk, as well as obtaining parent/guardian's permission (Kauffman, 1999). A notable limitation of the SSBD itself is that the system does not identify students with a comorbid condition (i.e., both externalizing and internalizing disorders). There is a range in terms of comorbidity among youth, with one review

suggesting moderate comorbid rates of about 25% between children with ODD and anxiety (Boylan et al., 2007). Angold and colleagues (1999) conducted a meta-analysis among a community sample, examining a median odds ratio, or the degree of association. In this study, depression had a 5.5 median odds ratio with ADHD and a 6.6 median odds ratio with conduct problem (i.e., ODD and CD). Since various aspects of functioning (e.g., socio-emotional and behavioral) are barriers associated with student outcomes, there is a need to examine these aspects simultaneously to determine the most salient factors for inclusion in future screening efforts upon school entry.

There have been preliminary efforts to examine more comprehensive screening (i.e., emotional, behavioral, and academic) in relation to academic and behavioral outcomes. For example, a study was conducted in one rural district in Ohio with a 95% Caucasian sample of 235 kindergarten students (Serrano, Watabe, Owens, 2013). In this study, 12 kindergarten teachers completed academic, social, emotional, and behavioral measures in the fall and spring for students who had consented to partake in the study. The study measures academic performance through standardized test scores (i.e., local screening measure, Kindergarten Readiness Assessment-Literacy (KRAL) and LCAP (reading and math), grades, and teacher ratings of academic impairment. In terms of social measures, this study incorporated the Impairment Rating Scale (IRS), specifically the peer relations' section; whereas for emotional measures the Strengths and Difficulties Questionnaire (SDQ) was administered. Behavior was also measured through rating scales (i.e., Disruptive Behavior Rating Scales, specifically the inattention and hyperactivity subscales), Behavioral and Emotional Screening System (BESS), and daily behavioral ratings (percent green days on the wheel). This study examined the relations

between variables through stepwise regression. The KRAL accounted for 2-17% of variance for spring social, emotional, and behavioral measures. However, when the KRAL was considered in combination with the other predictor measures (i.e., social, emotional, and behavioral), it then uniquely accounted for 1-2% of the variance for social, emotional, and behavioral measures. Additional students at-risk (i.e., those who did not overlap with detection by the KRAL measure) were identified through using emotional (SDQ 4%), social (teacher's peer ratings 2%) and behavioral measures (BESS 2%, Inattention 6%, and Hyperactivity/Impulsivity 6%).

Lastly, within the same study, Serrano et al. (2013), also examined the stability of risk status through the Receiving Operating Characteristics (ROC) Curve, which assesses a binary outcome, in this case whether a child was rated at-risk in the BESS at time 1 (fall) and time 2 (spring) of kindergarten. Fourteen children were found to remain at-risk based on teacher ratings from the BESS. The screening measures that predicted the most variability from most to least were: teacher ratings of inattention, hyperactivity/impulsivity, peer relations, emotional problems, and academic performance on the KRAL. Overall, this preliminary study's results suggest the benefit of incorporating academic and behavioral predictors be incorporated into screening measures. Future research should increase generalizability by including a larger sample size across different school and regions and be more representative of the United States' demographics. Moreover, future research can also examine whether screening efforts predict long-term outcomes for students.

Methodological, Ethical, and Developmental Issues to Consider

The measures that were used within the current study are being collectively used as a type of screener in relation to future outcomes. With an increased emphasis on accountability and early prevention and intervention efforts, universal screening can assist with data provision. However, it is worthwhile to review several important methodological and ethical considerations when utilizing screeners. A methodological consideration is timing of administration. Gredler (2004) recommends using screening three months into the school year to allow children an adjustment period to their school environment, including their teacher. Another methodological consideration, regardless of which type of screener is used, is good psychometric properties, such as high validity and reliability (Gredler, 2004). Validity is defined as measuring the construct you actually want to examine, whereas reliability is defined as the consistency of a measurement tool's results over time (Aylward, 1994). There are mixed data regarding stability of some of these individual differences during early childhood (La Paro & Pianta, 2000). This lack of reliability may have serious implications for students as schools often use this data from screeners to inform instrumental educational decisions, such as retention and labeling (Meisels, 1999).

In order to follow ethical guidelines in making these educational decisions (i.e., best practices), it is crucial to use an ecological approach for assessment (Bronfenbrenner, 1979). An ecological approach consists of a multi-method, multi-source assessment to make educational decisions (e.g., resource allocation and retention), rather than relying on one method and/or source of data (McConaughy & Ritter, 2008). Various research studies support this ecological approach to assessment (McConaughy & Ritter,

2008; Ruffalo & Elliot, 1997; Verhulst, Hans, & Van der Ende, 1994). Data suggest that one source of information may potentially yield a high false positive rate. For example, Glascoe (1997) found among a sample of parents who were assessing different areas of development (i.e., language, self-help, motor, health, and pre-academic skills) that 69% of children were misidentified (i.e., false positives). Lastly, there are often discrepancies in different raters' perceptions of children's behavior across settings (McConaughy & Ritter, 2008; Ruffalo & Elliot, 1997). Consequently, various studies suggest that incorporating reporters across settings can provide a more comprehensive perspective of the child. Therefore, multiple settings should be incorporated to adhere to an ecological approach.

There are several hypotheses for why discrepancies exist across raters for a child's behavior (Van Horn, Atkins-Burnett, Karlin, & Synder, 2007). One hypothesis is situational specificity, in which a child's behavior may manifest differently across settings (e.g., home versus school), resulting in different raters' perceptions on a screener (Achenbach, McConaughy, & Howell, 1987; McConaughy & Ritter, 2008). Ruffalo and Elliot (1997) conducted a study to examine prosocial behavior of early elementary school students among different raters (i.e., parents and teachers). The 42 parent dyads (i.e., mothers and fathers) and 24 teachers varied in their ratings of 24 students on the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990). There was a moderate correlation between mothers' and fathers' ratings of their child's prosocial behavior; however, there were very weak correlations between teachers' and parents' ratings. Ruffalo and Elliot (1997) proposed this discrepancy may be due to variation in parent and teacher item content for different settings. Lastly, differences in patterns among raters suggest age

groups and specific disorders distinctions. Achenbach and colleagues (1987) found that correlations were higher among raters for younger children than for adolescents in the Achenbach System of Behavior Assessment (ASEBA), as well as among raters for externalizing versus internalizing concerns. The higher correspondence between raters can be partially attributed to externalizing behaviors being disruptive and more overt than symptoms of internalizing behaviors.

There also are developmental factors to consider in examining young children's school adjustment. Generally, self-reports are not available for young children until at least 6 years old (e.g., on behavioral rating scales, such as the Achenbach System of Empirically Based Assessment (ASEBA) Self Report Form; Achenbach & Rescorla, 2001; or prosocial behavior rating scales, like the Social Skills Rating System (SSRS); Gresham & Elliot, 1990); Social Skills Improvement System (SSIS); Gresham & Elliot, 2008). Young children may not be selected as self-reporters due to their limited insight or language skills (e.g., vocabulary to understand or answer questions); consequently, parents and teachers may serve as reporters during this developmental period. However, a notable limitation with any reporting (e.g., rating scales) is subjective bias (e.g., recency effects, frequency of behavior, and negative halo effects; Stevens, 1980). This limitation reiterates the importance of using an ecological approach in an evaluation (i.e., use of multiple methods), such as school archival records and standardized measures, in addition to rating scales.

Summary of Current Study's Aims and Hypotheses

The current study has three aims. The primary aim of this study was to determine which early risk and resiliency factors are most associated with academic and behavioral

adjustment and maladjustment when various predictors are simultaneously included within the model. The second aim of the study was to examine the relations among early academic and behavioral variables upon kindergarten entry in order to determine whether variables should be collapsed to avoid multicollinearity.

As indicated the primary aim of this current study was to determine which potential risk and protective factors are most predictive of individual outcomes (i.e., academically and behaviorally) and problem behaviors (e.g., internalizing and externalizing). Much of the extant literature focuses on academic outcomes; therefore, the researcher predicted that early academic factors (including academic performance) would be a major predictor of long-term academic performance, in line with various studies (e.g., Bodovski & Youn, 2012). The researcher also predicted that early factors (including academic performance) would influence later behavioral adjustment (Archwamety & Katsiyannis, 2000; Malmgren & Leone, 2000). However, there is less research examining behavioral factors as both a predictor and outcome over time. The researcher hypothesized that externalizing behaviors would significantly predict later maladjustment in secondary school. Another hypothesis was that internalizing symptoms would predict long-term internalizing symptoms/diagnosis (e.g., Colman et al., 2007). There is more ambiguity over whether internalizing problems were related to academic maladjustment, as there are mixed findings within the literature (Duncan et al., 2007; Henricsson & Rydell, 2006).

A second aim of the current study was to determine the associations among early behavioral risk factors and protective factors. Although less information appears available in the literature, the primary researcher predicted moderate relations would

emerge between internalizing and externalizing problems (Breslau et al., 2009).

Exploring these relations can help determine how related early predictor variables and subsequently guide if predictor variables are collapsed or retained separately within the statistical models.

The third aim of the study was to examine group differences. The third aim was to determine whether demographic variables (e.g., child/family characteristics) moderate the relations between resiliency predictors (i.e., behavioral risk and protective factors) and outcomes (i.e., academic and behavioral). In particular, the study determined whether relations differed among early behavioral factors and eighth-grade outcomes (i.e., academic and behavioral) varied by gender, and family socioeconomic status composite. This type of analysis highlighted which relations between resiliency and outcomes remain once these systematic differences were accounted for within the model. Moreover, it can be helpful for educators to know which groupings may be the most vulnerable to negative outcomes to better serve the needs of students from a preventative standpoint.

It is crucial for researchers and school personnel to determine which risk and resiliency factors are most central to adjustment outcomes over time. Academic predictors are often found to be significant for later adjustment outcomes (Bodovski & Youn, 2012). However, less is known about behavioral variables as predictors and outcomes, especially in tandem with academic variables. The current researcher sought to expand the literature by examining risk and resiliency factors upon school entry in kindergarten and academic and behavioral outcomes in eighth grade among a diverse sample derived from the Early Longitudinal Study-Kindergarten (ECLS-K). Through

these efforts, educators can determine the most salient risk and protective factors among a range of children, which can inform future screening efforts.

Figure 1 provides an overview of the conceptual model of this study. As can be seen in the model, there are alterable variables (e.g., early academic performance, early school-related emotional adjustment, early externalizing and internalizing problems), as well as unalterable variables (gender, race, and socioeconomic status). In the center column of the diagram, there are the unalterable variables: child/family characteristics (e.g., gender, race socioeconomic status composite) as potential moderators. The current researcher hypothesized that demographic variables may moderate the relations between alterable factors and adolescent outcomes, which is represented by the right column. The current study had several outcomes of interest, including academic (e.g., direct assessments, grades, and retention status) and behavioral outcomes (e.g., presence or absence of in and out of school suspension, educational/mental health diagnosis, and whether internalizing and/or externalizing concerns) were present.)

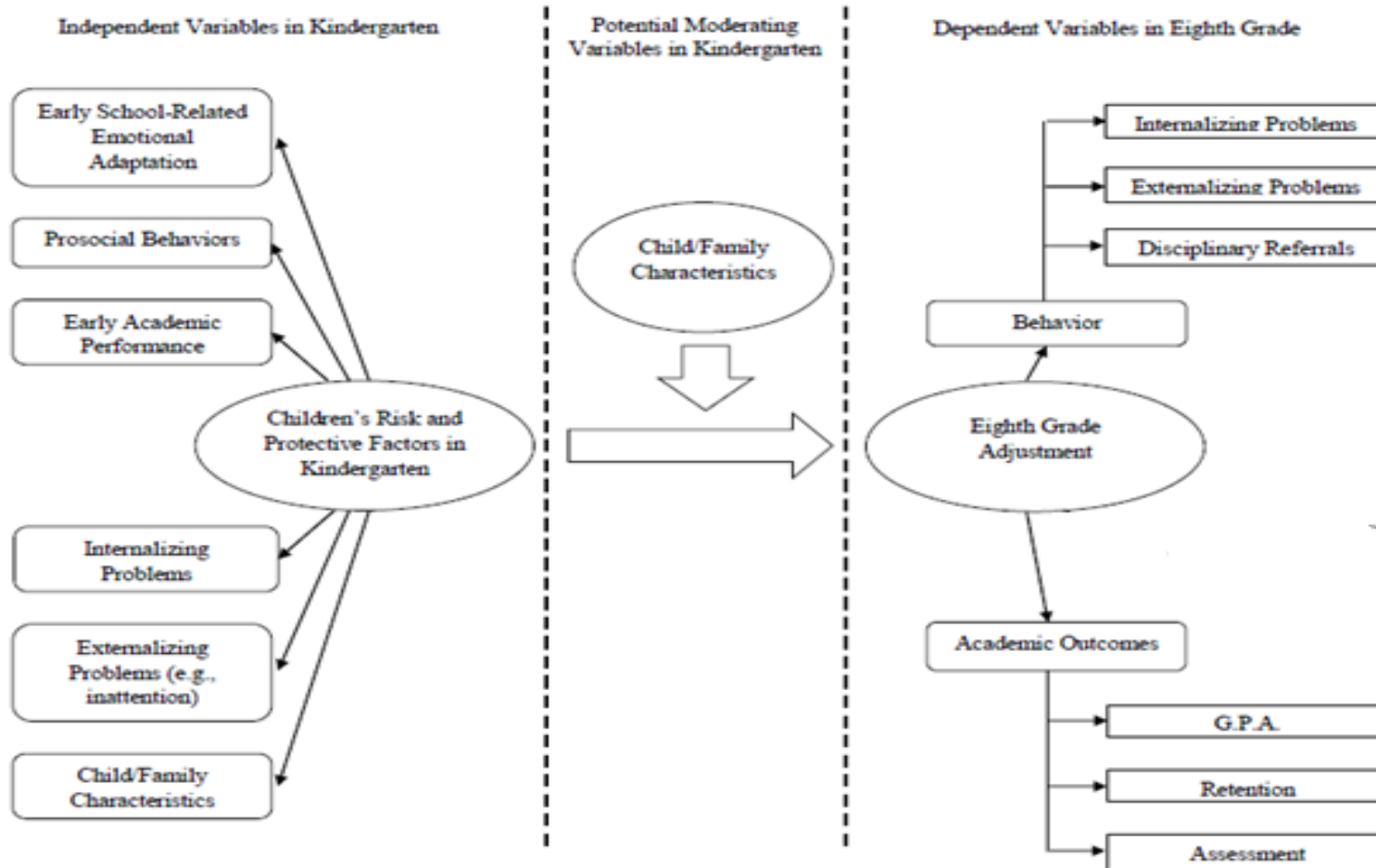


Figure 1. *General Conceptual Model of Risk and Resiliency*

Chapter 3: Method

This chapter will outline the purpose of the study, source of the data, major variables, control variables, participants, procedure, as well as the analysis plan. =.

Purpose of the Study

The current study should expand risk and resiliency research in several ways. There are few studies that examine behavioral factors in kindergarten in relation to academic and behavioral outcomes in eighth grade, while controlling for kindergarten academic factors. The current study analyzed potential risk factors and resiliency factors in kindergarten in relation to academic and behavioral adjustment in eighth grade in tandem among a diverse, national sample. The focus of this study on early behavioral indicators of later school success was important within the field of education given the current movement to be proactive in monitoring and addressing learning difficulties as soon as possible in order to prevent the development of more severe concerns. Within the Response to Intervention (RtI) model, which has been recently renamed as Multi-Tiered System of Support (MTSS) to reflect the integration of academic and behavioral problem-solving, it is important to create alignment between student needs based on data and tiers of instruction and intervention (Stockslager et al., 2013). In MTSS, there is a particular focus on universal screening efforts that incorporate both academic and behavioral concerns, both of which are addressed in this study. There also should be efforts to identify children who may be more vulnerable (e.g., from low SES groups) to academic and behavioral concerns. The current study addressed this piece of the model by examining demographic factors to determine which children are at greatest risk. Models like MTSS highlight that establishing a

positive academic trajectory is important, especially with a shift towards a more academic emphasis in kindergarten in the U.S. and an overall increased emphasis on accountability of student outcomes. Results of the current study will help to inform early prevention and intervention efforts upon school entry by identifying which behavioral indicators in kindergarten put children at greatest risk for academic and behavioral concerns in the long term (i.e., in eighth grade), as well as which early behavioral factors potentially protect them from the development of later problems.

Sources of the Data

To address the current research questions, data from the public use data files of the Early Child Longitudinal Study-Kindergarten (ECLS-K) were used. The ECLS-K enables researchers to follow children in the United States from kindergarten through eighth grade in terms of individual and family characteristics. The current study provides a more comprehensive youth assessment through incorporating all of these methods of data (e.g., interview, direct assessment, rating scales), in addition to including multiple raters (i.e., parents and teachers). This data set has several advantages, such as the long duration of the study, which improves upon the design of cross-sectional studies (Compas & Reeslund, 2009). This sample also was nationally representative of kindergarten students, and it includes various public and private schools. A range of students, including those with disabilities, were included within the data set. Overall, the researchers who gathered the data used a multistage, stratified, clustered probability sampling design, which first selected counties and groups of counties as its primary sampling units (PSU). The second stage units within the data were schools, with 1,277 schools selected. Based on a weighted rate, the response rate was 74% for the schools selected participated during the base year of kindergarten. Please note that substitution schools were added during the spring of

kindergarten; however, these schools were not included in the response rate specified above. Finally, for the third stage, students were randomly chosen from a list within the selected schools, resulting in a total sample of 22,666 children in kindergarten. On average there were about 23 kindergarten students sampled from each school.

Data were collected from the fall of kindergarten until the spring of eighth grade between the years of 1998 until 2007, although some of the measures collected varied over time. Data collection occurred twice a year in kindergarten and first grade but only annually in third, fifth, and eighth grade. The current study primarily featured Wave 1 data (fall of kindergarten between September and December 1998) and Wave 7 data (spring of eighth grade for most students in 2007). Some data were also derived from Wave 2 (spring of kindergarten), such as the Academic Rating Scale.

Participant selection. The ECLS-K database includes a geographically and racially/ethnically diverse kindergarten sample from across the United States during the 1998 to 1999 school year. The database includes different school settings and programs (i.e., public and private; special education and/or general education, and half day or full day kindergarten), students with data from kindergarten and eighth grade (academic, behavioral, and background variables), and English Language Learners (ELLs). The ECLS-K investigators had interview versions in English and Spanish and, if the parents spoke another language, the researchers tried to locate a translator. The current study included a small subsample of students (5%) that were repeating kindergarten in the base year of 1998 (Tourangeau, Nord, Lê, Sorongon, & Najarian, 2009; West, Denton, Germino-Hauskin, 2000). It should also be noted that there were also about 5% of students during the next school (1999-2000) who were retained in kindergarten, whereas the majority of the ECLS-K cohort would have been in first grade.

When most students were in first grade (1999-2000 school year), the researchers “freshened” the data set by including more students to recreate a nationally representative sample. However, based on the current researcher’s interests in following children from kindergarten through eighth grade in terms of risk and resilience, children without data from both Wave 1 (fall of Kindergarten) or Wave 2 (spring of kindergarten) and Wave 7 (spring of eighth grade) were excluded. The ECLS-K researchers created validity guidelines for subscales based on minimum item completion, which the current study followed for early school-related emotional adaptation scale and the mental health items (i.e., internalizing and externalizing problems) in eighth grade. The other scales from the ECLS-K study were already created and consequently individual items were not available so the valid data were used for those scales. The ECLS-K study also used a complex sampling strategy to follow students who were retained and/or transferred schools, which is briefly discussed in the attrition section below.

Through the use of weights, which is further explained in the following section (**Attrition**), certain criteria had to be met to be included within the analysis. Based on the recommended longitudinal weight (i.e., C1_7FP0) by an Educational Statistician through the National Center for Education Statistics, in order to be included within the sample, the child needed to have the following data ...

Parent interview data available for the six rounds of data collection (fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, and spring-eighth grade) alone or combined with (a) child assessment data from any of these six rounds, (b) data from any fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade teacher questionnaire (teacher-level or child-level), (c) data from any spring kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-

eighth grade school administrator questionnaire, or (d) data from any spring-kindergarten, spring-first grade, spring-third grade, or spring-fifth grade school facilities checklist.

(Tourangeau et al., 2009, p. 1026)

Ideally, the weight would be based off only on the variables of interest (e.g., parent interview spring of kindergarten and spring of kindergarten). However, due to the extensive number of potential combinations, this weight was the closest approximation to the desired selection of variables. A positive aspect of this weight selection was that it allowed students from other languages to be included as only some assessment data are required for inclusion within the dataset. In terms of inclusionary criteria, students from public and private schools were included, as well as students from different language backgrounds, as long as a parent interview could be conducted or student assessment data were available from kindergarten and eighth grade. In addition, there was inclusion of students with accommodations for testing and/or Individualized Education Plan (e.g., students with an Autism Spectrum Disorder, or intellectual disability.) There was a very small portion of the sample that could not take any components of the assessment due to a disability (e.g., being blind and requiring Braille); however, having assessment data were not required for inclusion, as parent interview data were another potential source for inclusion. Consequently, as long as students met the minimum requirements specified above for the selected weight, the student were included within the sample. Therefore, students from private and public schools were included, as well as students with disabilities, and those with some missing data, although some measures were excluded if the amount of data did not meet the criteria for that particular subscale. The only explicit exclusionary criteria was that students needed to have data from Wave 1 (fall of kindergarten) or Wave 2 (spring of kindergarten) and Wave 7 (spring of eighth grade). Please note no additional exclusionary

criteria were established in order to enhance statistical power and increase generalizability of the findings.

Attrition. Due to the longitudinal nature of the current study, attrition and potential related biases were examined. Based on previous studies of the ECLS-K, the two major reasons for attrition are school mobility rates and nonresponse (Parkinson, 2011). The ECLS-K investigators tried to offset school mobility rates through following a random sample of subset of students who transferred schools in first, third, fifth, and eighth grade, as well as by using appropriate weights. In particular, researchers made efforts to follow students from more unique backgrounds (e.g., special education) over time. (Please refer to Tourangeau and colleagues' 2009 user manual for a detailed description of sample design and implementation.). In the spring of first grade, a random sample of 50% of kindergarten schools were chosen to follow students who were going to move, with a priority being focused on students who had already completed their data in the fall. Students who relocated out of the country were not followed. The same procedure was followed in third, fifth, and eighth grade.

It is also important to note that the NCES researchers made efforts to follow students who had been retained. It was estimated of the remaining, overall sample in the spring of 2007 that about 87% of students were in eighth grade, as anticipated, while about 13% of students were in a lower grade placement than eighth grade. Please note there was also a small percentage of the sample (less than half a percent) that was placed beyond eighth grade (<http://nces.ed.gov/ecls/kindergarten.asp>, not specified).

The current study used ECLS-K weights for three reasons: (1) to make generalizations about a larger population of students, (2) to adjust for differential sampling rates (certain groups, such as Asian/Pacific Islander children and private school children that are oversampled within

the study in comparison to their presence in the general population), and (3) adjust for differential nonresponse (e.g., which parents agreed to be interviewed). Regarding point two, Asian/Pacific Islander students were oversampled at a 2.5 times higher rate than peers (NCES, 2013). Weights were carefully calibrated using a strategy called raking to offset attrition biases. In order to ensure the proper selection of weights, the researcher contacted the ECLS-K technical support staff for related guidance and followed their recommendations. Based on this contact, the recommendation was made to use C1_7FP0 as the appropriate weight. This recommendation was based on the primary researcher reporting that the following waves of data (1, 2, and 7) were being used in this current study and sources (parent and teacher interview in the fall of kindergarten, reading and math assessments in the fall of kindergarten, teacher Academic Rating Scales [ARS] in the spring of kindergarten, and parent interview, reading and math assessment in the spring of eighth grade, and school record data in the spring of eighth grade). Once weights were applied the sample became restricted to only include students with parent interview data for the six rounds, which were specified above, alone or coupled with the other potential data, which were also outlined above.

Based on a previous study, there were 7,635 valid math, reading, and behavior scores from first into fifth grade (Bodovski & Youn, 2011). The current researcher estimated that if the attrition rate remains consistent that there would be an additional 25% decrease in the remaining sample, resulting in approximately 5,700 participants who have certain kindergarten predictors to examine in relation to their eighth grade outcomes. This projection was found to be a reasonable estimate, as the range of students in multiple regression and logistic regression analyses was between 5,365 and 6,105.

Due to the complex study design, missing data were analyzed using a different methodology, which was adapted from previous researchers (Bose & West, 2002; Brick & Bose, 2001) than typically employed. By comparing baseline kindergarten data between the estimated original kindergarten sample and estimated eighth grade spring respondents, it helped focus on the central issue of attrition. Tourangeau and colleagues (2009) reported that using this method allows "...a direct and easily interpreted measure of nonresponse bias due to the additional nonresponse arising from the loss in the sample size since the base year (pp. 7-22). Based on these analyses, the relative biases between the kindergarten students and the eighth grade students were reported to be low at less than 2% (Tourangeau et al., 2009). Students who participated in the study only in the kindergarten sample and not in the eighth grade for the required variables were only included in the attrition analyses but not in any subsequent analyses.

In order to provide additional information, the current researcher created tables, which can be found in Appendix C, displaying the weighted and unweighted frequencies, percentages, and means of the base year predictor variables. The original unweighted sample, which only required a child identification number, featured 21,409 participants. However, the kindergarten sample that was unweighted and required fall kindergarten parent interview (i.e., internalizing behavior) and math kindergarten fall assessment data had 17,171 participants. The unweighted sample declined to 6,242 observations in the eighth grade using the same criteria, as well as adding the eighth grade parent interview (i.e., internalizing behavior) and math eighth grade assessment data. Using the weights, a much larger number student population is displayed than in the unweighted sample, because the weights are calculated to generalize to the United States kindergarten population.

Some attrition trends should be noted within Table 1 and Appendix C. When weights were not used, there was a higher retention percentage-wise of Caucasian students in comparison to the Black and Hispanic population. Even without weights, gender remained relatively consistent across the waves. By applying weights, the ethnic/racial groups remained more consistent over time, demonstrating how the weights assist with nonresponder representation (i.e., certain students are weighted more heavily when these students are more likely to be nonresponders). Please note the researcher included the cross-sectional eighth grade, which included the “freshened sample” of first grade, as well as the longitudinal eighth grade weight, which only accounted for students who were in the original sample in kindergarten. In terms of the means, most of the values were similar across the unweighted and weighted values, with the exception of students with only a child identification number. Notably, unweighted student data who had parent interview and kindergarten math assessment, as well unweighted student data with the base year and eighth grade math assessment and parent interview data, had higher socioeconomic status than circumstances that required less and/or more flexible data. Overall, based on the complex attrition analyses cited within Tourangeau and colleagues (2009), there are relatively small biases between the base year and eighth grade when applying weights, which in the current study helps offset for potential nonresponse biases. Therefore, the data suggest minimum attrition bias.

Table 1

Attrition Table: Percentage of Distribution for Unweighted versus Weighted Data

	Unweighted Fall Kindergarten (ID only; observations = 21,409)	Weight by C1_7FP0 (Eighth Grade Longitudinal, observations = 6,751)
Predictors		
Control		
Demographic Variable		
Gender		
Male	51.18	51.87
Female	48.82	48.13
Race/ethnicity		
Caucasian	55.19	57.44
Black, non-Hispanic	15.06	17.03
Hispanic	17.87	18.08
Asian, non-Hispanic	6.38	3.01
Native American	2.83	2.32
Multi	2.56	2.10
1 st Time Kindergarten	95.30	95.51

Note. K is for Kindergarten, Unweighted Fall Kindergarten is when no weight, strata, or cluster have been applied and the student only needed to have a Child ID.

C1_7FP0 is a longitudinal weight including “parent interview data from six rounds of data collection (fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, and spring-eighth grade), alone or in combination with (a) child assessment data from these any of these six rounds, (b) data from any fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade teacher questionnaire (teacher-level or child-level), (c) data from any spring kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade school administrator questionnaire, or (d) data from any spring-kindergarten, spring-first grade, spring-third grade, or spring-fifth grade school facilities checklist (Tourangeau et al., 2007)”

Student and school characteristics. The initial participant sample included 22,666 students from 1,000 elementary schools (public $N = 800$; private $N = 200$). As previously indicated, students from the 1998-1999 kindergarten cohort were followed into the 2006-2007 school year and would be eighth-grade students if they were on track academically.

Major Variables

The current study accounted for the major variables of interest through predictor blocks 3 (early behavioral resiliency factors) and 4 (early risk factors). Predictor block 1, the child/family characteristics and predictor block 2, early academic performance, was entered first into the

different regression models as control variables. The major predictor variables in the current study included predictor block 3: early behavioral resiliency factors (early school-related emotional adaptation and prosocial behavior) and predictor block 4, early behavioral risk factors (externalizing and internalizing problems) were considered last. In terms of outcomes, secondary school early adolescent adjustment, including academic performance (standardized test scores on direct assessments in reading and math, grade point average) and behavioral adjustment (disciplinary record, internalizing and externalizing symptoms, and mental health/educational diagnoses) were examined. Variables for each of the constructs are designated in Table 2 for predictors and outcomes. Please note that correlations, exploratory factory analyses, as well as consultation with measurement experts, were conducted to verify the constructs below. Each of these variables is outlined in the following sections.

Table 2

Variable Coding

Variables	Coding Methodology	Coding Value/Centering Procedure	Time Point Collected	Component
Independent				
Child/Family Characteristics				
Gender	Student gender	M=/F = 1/0	Created from best source of data based off of IES determination	Not Specified: GENDER
Race/Ethnicity	Student race	Child composite race recoded into 5 categories: 1 = Caucasian, Non-Hispanic 2 = Black, Non-Hispanic 3 = Hispanic 4= Asian 5 = Multi-racial	Created from best source of data based off of IES determination	Not Specified: RACE recoded into RACE_5CAT then yes or no per each race (1 = yes, 0=no) and 0 is for Caucasian.
Socioeconomic (SES) status composite	Average of parent education, occupation, and income	Continuous	Fall K	Parent Interview: WKSESL

Table 2 (Continued)

Variables	Coding Methodology	Coding Value/Centering Procedure	Time Point Collected	Component
Early academic factors:				
Basic reading test	Total reading score	Item Response Theory (IRT) Scale Score	Fall K	Direct Child Assessment: C1R4RSCL
Basic reading Academic Rating Scale	Academic Rating Scale (ARS) in reading by teacher	Continuous	Spring K	Teacher Rating Scale: T2RARSLI
Basic math test	Total math score	IRT Scale Score	Fall K	Direct Child Assessment: C1R4MSCL
Basic math Academic Rating Scale (ARS)	Academic Rating Scale (ARS) in math by teacher	Continuous (see ARS above)	Spring K	Teacher Rating Scale: T2RARSMA
Kindergarten grade status	First-time in kindergarten	Y/N = 1/0	Fall 1999	Teacher Interview: NP1FIRKDG
Early behavioral factors:				
Parent-reported early behavioral factors:				
Early school-related emotional adaptation	Average rating of early school related emotional adaptation	Continuous	Fall K	Interview: P1COMPL; P1UPSET; P1PRETEN; P1GOOD*; P1LIKET*; P1LOOKFO*
Prosocial behaviors	Average prosocial behavior	Continuous	Fall K	Recoded to average P1EMOAdjc Parent SRS: P1SOCIAL
Externalizing behaviors	Average externalizing behavior	Continuous	Fall K	Parent SRS: P1IMPULS
Internalizing behaviors	Average internalizing behaviors	Continuous	Fall K	Parent SRS: P1SADLON
Teacher-reported early behavioral factors:				
Prosocial behaviors	Average prosocial behavior	Continuous	Fall K	Teacher SRS: T1INTERP
Externalizing behaviors	Average externalizing behaviors	Continuous	Fall K	Teacher SRS: T1EXTERN
Internalizing behaviors	Average internalizing behaviors	Continuous	Fall K	Teacher SRS: T1INTERN
Early adolescent outcomes:				
Academic outcomes:				

Table 2 (Continued)

Variables	Coding Methodology	Coding Value/Centering Procedure	Time Point Collected	Component
Direct reading test	Total reading score	IRT Scale Score	Spring Eighth**	Direct Child Assessment: C7R4RSCL
Direct math test	Total math score	IRT Scale Score	Spring Eighth**	Direct Child Assessment: C7R4MSCL
Grade Point Average (GPA)	Overall GPA in Eighth grade	Recoded into less than 2.0 = 0 2.0+ = 1	Spring Eighth**	Parent Interview: P7SCHGRD recoded into P7SCHGRAD_CAT
Retention	Current grade level at eighth grade or above	Recoded into Y/N = 1/0	Spring Eighth**	Questionnaire: T7GLVL recoded into T7GLVL_CAT
Behavioral outcomes: Suspension	Presence or absence of in or out of school suspensions	Y/N = 1/0	Spring Eighth**	Parent Interview: P7SUSPND
Educational or mental health diagnosis	Presence or absence of diagnosis	Y/N = 1/0	Spring Eighth**	Parent Interview: P7DISABL
Internalizing concerns	Average internalizing behaviors	Continuous	Spring Eighth**	Parent Interview: P7WORRY; P7UNHAPP; P7NERVOS; P7ILLNES; P7FEARS; P7BULLID; P7ALONE
Externalizing concerns	Average externalizing behaviors	Continuous	Spring Eighth**	Recoded into average: P7INTSYMP Parent Interview: P7TEMPER; P7STEALS; P7RSTLSS; P7FIGHTS; P7FIDGET; P7DSTRCT; P7CHEATS; P7ATTENT*; P7THINKS* Recoded into average: P7EXTSYMP

Note. All of the predictors were from Wave 1 (fall of kindergarten) and all of the outcomes were from Wave 7 (spring of eighth grade), with the exception of teacher academic rating from the spring of kindergarten. Abbreviation of K = Kindergarten, N = No, Y = Yes. Behavioral measures (e.g., prosocial, externalizing, and internalizing behaviors) in kindergarten are derived from the Social Rating Scales (SRS), which were adapted from the Social Skills Rating Scales (SSRS, Gresham & Elliot, 1990). * indicates reverse scoring of item. ** Indicates that the majority of students would have been in eighth grade.

Predictor block 1: Control variables. The current study focused on the early behavioral protective and risk factors; however, the current researcher included several types of variables to control for variance due to potential differences across participants. The control variable categories include: (1) child/family characteristics (e.g., gender and family socioeconomic status composite); (2) early academic performance (i.e., direct assessments for early reading skills and math, which were separately evaluated); academic retention in kindergarten prior to 1998-1999; and academic ratings (i.e., teacher evaluations in both reading and math).

Demographic factors. A strength of several past studies has been controlling for confounding variables. Therefore, in line with previous research, the current study considered how potential confounding variables, such as demographics (e.g., gender and family socioeconomic status composite) are linked to school success (e.g., Duncan & Magnuson, 2005; Farkas & Hibel, 2008). This is particularly important because of the diversity found within the large ECLS-K data base (Jerald, 2006). The definition of each demographic variable is presented below for child/family and school-level.

Gender. A child is classified as male (1) or a female (0).

Race/ethnicity. The ECLS-K researchers created a race composite off of the best available information, including different waves of parent interviews. The original researchers initially created eight racial/ethnic categories (White, non-Hispanic; Black, non-Hispanic; Hispanic race specified; Hispanic race, not specified; Asian; Native American; American Indian or Alaskan Native; multi-racial). The current researcher consolidated the race/ethnicity composite by recoding the variables into 6 categories (1 = Caucasian, non-Hispanic; 2 = Black, non-Hispanic; 3 = Hispanic, whether race was specified or not; 4 = Asian,

5= Native American; and 6 = multi-racial). Dummy variables were created for groups two through six and Caucasian was the reference category.

Family socioeconomic status (SES) composite. Family socioeconomic status composite includes an average of the following five variables if the data were available from the fall of 1998: (1) father/male guardian's education, (2) mother/female guardian's education, (3) father/male's occupation, (4) mother/female guardian's occupation, and (5) household income. In models that used multivariate analysis, the continuous family SES composite was incorporated into these equations. In terms of missing data, the original researchers used "hot deck" imputation. (For more detailed information see Tourangeau and colleagues, 2009.) The range for the continuous version of the family socioeconomic status composite (WKSESL), which was standardized, was from - 4.75 to 2.75, with a mean of zero and a standard deviation of 1.

A student's socioeconomic (SES) status has been tied to lower levels of school achievement than peers from higher SES categories in various studies (e.g., Alexander et al., 1997; Rumberger, 1995). The ECLS-K researchers derived family SES from the spring 1999 parent interview data. Families that were considered to be in poverty were based off household size and weighted average thresholds for 1998. Please see Table 3 below for information about poverty levels around the time of data collection.

Table 3

Preliminary Census Poverty Thresholds for 1998

Household Size	Weighted Average Thresholds
2	\$10,973
3	\$13,001
4	\$16,655
5	\$19,682
6	\$22,227
7	\$25,188
8	\$28,023
9+	\$33,073

Note. Derived from the U.S. Census Bureau Population Survey. <http://www.census.gov/hhes/poverty/threshld/thresh98.html>

Predictor block 2: Early academic factors. Early academic factors included: direct assessments for early reading skills and early math skills, as well academic rating in reading and math, and kindergarten grade status. The definition for each of these variables is described below.

Direct assessment for early reading skills. The direct assessment score for early reading skills in the current study was based on the standardized score (i.e., IRT scale score). By using an IRT scale score, the researcher estimated how a student performs in a specific content area (e.g., reading). This estimate was based on the items that he or she completed and then projecting performance on subsequent items. IRT scores are also recommended as they could be used over time to measure growth.

There were some children that were excluded from this direct, early reading assessment. Some children with disabilities (e.g., students requiring Braille, large print, or sign language) did not take the test and this is represented within the data file by a non-zero designation. However,

students with disabilities who took either test of reading and/or math were permitted accommodations (setting, schedule/timing, healthcare aide, and assistive devices) in accordance with his or her school's records (e.g., 504 Plan; Individualized Education Plan (IEP)).

The reading assessment was created specifically for the ECLS-K study, and it was administered in English. Consequently, students who were from homes where the child's home language was not English, as indicated by school records, took an English proficiency test that measured receptive and expressive language skills (Oral Language Development Scale, OLDS; Tourangeau et al., 2001). If the student passed the English proficiency test then he or she received the reading and math assessments in English. The direct, early reading assessment was only available in English, therefore, excluding English Language Learners (ELLs) who failed the OLDS in this content area. West and colleagues (2000) indicated of first-time kindergarten students that 93% of students were able to take the only available reading assessment in English. Of the total first-time kindergarten cross-sectional students, 7% of students were excluded from the reading assessment based on their scores falling below the designated cutoff point. Of these 7% of first-time kindergarten students excluded, 19% were Asian students and 80% were Hispanic students (West, Denton, & Germino Hausken, 2000). Due to the use of sampling weights, students who were excluded from the reading assessment in kindergarten (e.g., falling below the threshold of language proficiency or did not partake in the assessment) can still be included within the longitudinal sample if the student had parent data present in the fall of kindergarten.

There were standardized procedures for evaluating early reading skills. During this fall kindergarten assessment in 1998, the trained administrator conducted the testing to a student individually with the assistance of a computer. However, students did not type or have to explain

their answers, but rather point or provide verbal responses. Each student was administered a two-stage test to provide different levels of difficulty in order to prevent floor effects or ceiling effects, in which either a test is too easy and underestimates a person's abilities, or a test is too difficult and overestimates a person's abilities, respectively. Then the student was administered the second-stage based on his or her routing performance from the first stage from three possible levels (Weston et al., 2000). All of the students who qualified to take the test were evaluated in the following basic reading skills: phonemic awareness (beginning and ending sounds), phonics (e.g., letter recognition), and vocabulary (e.g., receptive), and comprehension (i.e., listening and words with context) during an untimed test.

In order for a kindergarten student's data to be included he or she needed to complete at least 10 reading items. Only a fraction of 1% of kindergarten students did not meet this set criterion of those from the overall kindergarten grade sample (U.S. Department of Education, 2002). Also from the entire kindergarten sample, the Cronbach's alphas ranged from .69 to .90, with the lower alphas among the low form and the higher alphas among the high testing reading form. In terms of reliability, the entire, valid kindergarten sample for the full reading test was .93 for the Item Response Theory (IRT) theta score.

Direct assessment for early math skills. The direct assessment for early math skills was similar to the direct assessment for reading skills in terms of type of score, design, and administration. However, the math test varied from the reading test in terms of some of the inclusion criteria, content, and testing materials. The current study also used IRT scale scores to evaluate a student's or subgroup's (e.g., low SES) performance in comparison to peers. Moreover, this math assessment was also designed specifically for the ECLS-K study. There was similar exclusionary criteria in which some children with a disability did not take this

assessment. One of the major differences was that the direct assessment was available in Spanish. If students did not score above the cut-off score on the OLDS English proficiency assessment, then the student was administered the OLDS in Spanish. If the student achieved at or above the cut-off score on the OLDS Spanish version then the student could be administered the math test in Spanish. Otherwise, administration was the same as the reading test in terms of computer assistance and one-on-one delivery format, as well as untimed. In terms of the content area, the early math topics included: conceptual knowledge, procedural knowledge, and problem-solving. About half of the test items related to: number sense, properties, and operations, whereas, the remainder of the test included: geometry and spatial reasoning, data analysis, statistics, probability, patterns, and algebra. Children were provided with manipulatives (i.e., blocks) and paper and pencil for the applicable sections. Again there were two stages, an initial routing stage, followed by the second stage, which had three skill levels (Weston et al., 2000).

In order for a kindergarten student's data to be included he or she needed to complete at least 10 math items. Only a fraction of 1% of kindergarten students did not meet this set criterion of those from the overall kindergarten grade sample (U.S. Department of Education, 2002). Also from the entire kindergarten sample, the Cronbach alphas ranged from .66 to .80, with the lower alphas among the low and middle form and the higher alphas among the high testing math form. For reliability, the entire kindergarten sample for the full reading test was .92 for the Item Response Theory (IRT) theta score.

Academic Rating Scale in reading. In kindergarten the student's teacher rated him or her on a 5 point rating scale (1= not yet, 2 = beginning, 3 = in progress, 4 = intermediate, and 5= proficient). For reading, the kindergarten teacher would rate the student's language and literacy current skill level based on a teacher's past observation and experience with the student.

Specifically, teachers rate a student's proficiency in speaking (1 item), listening (1 item), early reading (3 items), and writing (1 item). If a skill had not been introduced within the classroom, the teacher could mark not applicable (N/A). Some items were relatively objective (e.g., labeling the entire alphabet for both upper and lower case letters), while other items were more subjective (e.g., creating a story).

In terms of psychometric properties, specific values for validity and reliability were not available in the psychometric report for kindergarten as a whole. However, the current researcher determined these values for the longitudinal sample. The psychometric report (U.S. DOE, 2002) indicated that kindergarten and grade one teachers from private and public schools, as well as content experts, were involved in developing the content of these scales. No indication was noted of the number of items required for inclusion within the data set. Moreover, these indirect rating scales were pilot tested along with direct assessments in the spring of 1997. There were many teachers who rated various subareas as not applicable in the fall of kindergarten and subsequently there would have been a lot of missing data; consequently, the current researcher chose the second data wave for the indirect academic measure.

Academic rating scale in math. A student's kindergarten teacher rated him or her on the same five point scale (1= not yet, 2 = beginning, 3 = in progress, 4 = intermediate, and 5= proficient) as for academic rating scale in reading. For math, the teacher rated one item per student in the following skills: concept of numbers, solving number problems, use of math strategies, data analysis (graphing), and measurement. Teachers again could use the designated N/A category if the skill had not been taught in the classroom yet. The psychometric data were not available from the psychometric report. Once again due to the extent of the missing data due the category of to Not Applicable (N/A) ratings in the fall of kindergarten, the current researcher

utilized the teacher academic ratings for math in the spring of kindergarten (U.S. DOE, 2002). Specifically, the current researcher used a combined calibration of fall and spring kindergarten teacher ratings based on the errors found by IES researchers and their subsequent recommendations (Tourangeau, Nord, Le, Wan, Bose, & West, 2002).

Kindergarten grade status. If a child was retained prior to or during the 1998-1999 academic year in kindergarten, the student was marked as being retained (0 = no, 1 = yes). Research studies indicate worse academic outcomes for students who are retained than their peers who are never retained (Pagani, Tremblay, Vitaro, Boulerice, & McDuff, 2001).

Predictor block 3 and 4: Early behavioral resiliency and risk factors. Early behavioral resiliency and risk factors, with the exception of early school-related emotional adaptation, were measured using parent and teacher report of the Social Rating Scale (SRS). SRS is a modified version of the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990) for the ECLS-K in the fall of kindergarten and includes: prosocial behavior, self-control, externalizing problems or concerns, and internalizing problems or concerns. Each item used a frequency scale from 1 (never) to 4 (very often). Due to copyright restrictions, no specific items can be included from this modified scale. To determine a score per a subscale for parent or teacher rater the average of items was calculated by NCES.

Data collection and psychometric properties are briefly reviewed for the SRS to avoid repetition later. Data from parents were gathered through a phone or in-person interview. For all of these scales, factor analyses, including exploratory and confirmatory types, were conducted using LISREL, which fell within acceptable limits (U.S. Department of Education, 2002). The available psychometric property (e.g., split half reliability) are specified for each subscale below.

The current researcher has included validity and reliability values for the scales from the longitudinal sample (i.e., have time points in kindergarten and eighth grade).

Please note that in the current study each resiliency factor, except early school-related emotional adaptation that has only one type of rater, it was predicted that separate composite scores would remain for teachers and parents (Offord et al., 1996). This hypothesis was based on how there are typically low correlations between raters' responses and different questions based on settings (Achenbach et al., 1987; Rock, Pollack, & Hausken, 2002); however, a preliminary analysis was run to compare teacher and parent ratings of youth's behavior. Since no correlation of approximately .70 was reached between raters' measures on the same type of scale (e.g., internalizing and externalizing symptoms), no behavioral risk or resiliency factors were combined. The current study did not use principal component analysis, which is a technique that helps reduce the dimension of data and make them more interpretable, because the current study failed to meet the criteria of at least three informants and across 2 settings (Kramer et al., 2003).

Predictor block 3: Early behavioral resiliency factors. Within the current study, early behavioral resiliency factors were measured by early school-related emotional adaptation and prosocial behavior.

Early school-related emotional adaptation. The first potential resiliency factor was early school-related emotional adaptation. The current study's major aim for studying early school-related emotional adaptation was to measure parents' report of children's adjustment to school, as it seemed to be a less common reporting method found within the literature. Previous research has centered on the teacher-child relationship in relation to adjustment. Often children lacking prosocial behavior (e.g., too dependent or disruptive) were more likely to experience strained relationships with their teachers, as well as more likely to dislike school and face adaptation

concerns. Steven and Cope's (2003) study suggested that parents may provide a more ecological explanation for their children's maladjustment rather than being purely child-based.

Specifically, the early school-related emotional adaptation scale was parent-reported, consisting of six questions asking about his or her child's adjustment to school on average during the first two months. Each item uses a three-point scale, ranging from 1 (more than once a week) to 3 (not at all), as well as 7 (refused) or 9 (don't know). An example item is over the last two months on average, "did the child complain about school more than once a week, once a week, or not at all?" Therefore, the questions ask parents to reflect retrospectively on his or her child's adaptation over the last few months. The information for inclusion criteria (i.e., the number of required items with valid data) from parents was not available, nor were data on the psychometric properties. The current study found that the Cronbach alpha was approximately .71 for the unweighted kindergarten sample overall. The current researcher coded response 7 and 9 ("refused" or "don't know", respectively) as missing data for the final analysis. The researcher also reversed coded the positively worded items (e.g., "say good things about schools", "liked his or her teacher", "look forward to going school"), which meant a high average adjustment (i.e., towards '3.0') would then indicate a positive early adjustment score. The current study provided a unique opportunity to determine whether parents' perceptions of their child's adaptation in kindergarten relates to long-term academic and behavioral adjustment in secondary school. A parent/guardian needed to complete at least two third of this subscale to be included within the current study.

Prosocial behavior. The second aspect of resiliency factors in the current study was prosocial behavior measured in the fall of kindergarten but not in eighth grade. Consequently, prosocial behavior only served as a predictor due to the availability of data. This subscale was

derived from the Social Interaction Scale from the parent SRS scale and from the Interpersonal Skills for the teacher rating scale. The parent rating scale (i.e., the Social Interaction Scale) consists of three items, measuring the parent's perception of his or her child's comfort level when initiating play, making and maintaining friends, and "...positively interacting (comforting, helping) with peers" (Tourangeau et al., 2001, pp. 2-11). The teacher's rating scale consists of five items measuring how a child develops and retains friendships, positively interacts with different people, displays empathy towards others, helps others, as well as expresses ideas and opinions in positive ways (Tourangeau et al., 2001). The psychometric data available were limited. For the overall kindergarten sample the split half reliabilities were .68 and .89 parents and teachers, respectively. In order to be included as part of the data set, the rater had to have valid answers for at least two thirds of the questions of this subscale.

Predictor block 4: Early behavioral risk factors. Within the current study, internalizing and externalizing concerns in the fall of kindergarten in 1998 were the two aspects of early behavioral risk factors. Please note that based on copyright restrictions, specific items could not be shared within these subsections. In order to be included within the measure at least two thirds of the items needed to be valid.

Internalizing concerns. Internalizing concerns in kindergarten were the first aspect of early behavioral risk factors that was also examined through SRS measures from parents and teachers in the fall of kindergarten. This subscale consists of 4 items measuring anxious symptoms, loneliness, low self-esteem, and sadness, and the parent or teacher rates the child on a 1 (never) to 4 (very often) scale. For the overall kindergarten sample the split half reliabilities were .60 and .89 for parents and teachers, respectively.

Externalizing concerns. The second aspect of early behavioral risk factors was externalizing concerns from the parent and teacher SRS measures. This construct consisted of externalizing problems subscale for teachers and the impulsive/overactive scale. If a rater's externalizing concerns subscales was not correlated at approximately .70 or higher, then the different rater's subscales were examined separately.

Each subscale includes a frequency rating from 1 (never) to 4 (very often). Externalizing problems consists of five items per the teacher rater measuring the frequency of disruptive behavior, such as arguing, fighting, getting angry, acting impulsively, and interrupting activities. Externalizing problems consists of two items measuring impulsivity and activity level per parent judgment of his or her kindergarten child. For the overall initial kindergarten sample, the split half reliabilities for externalizing problems were .46 for parents and .90 for teachers.

Outcome: Early adolescent adjustment. Early academic adjustment in the current study consisted of academic and behavioral adjustment of students in the longitudinal study from kindergarten through eighth grade.

Early adolescent academic performance. There were also several measures of early adolescent academic performance. A direct assessment of reading and math were measured, as well as data gathered about grade point average. Please find the specific measures described below.

Direct assessment in reading. The reading assessment was administered in paper-and-pencil format and administered by a proctor in a group, timed setting of students from the same school. The content of this test was based off of the National Assessment of Educational Progress (NAEP) per subject; however, due to time constraints there were far fewer items on the ECLS-K test than on the NAEP test. The content was then reviewed by content and

measurement experts and revised accordingly, as well as field tests were conducted in the spring of 2006. The current study used a standardized score (i.e., IRT scale score) in order to compare the student or subgroup of students to peers. Unlike in kindergarten, only a two-form, or stage test (i.e., easy versus hard) rather than a three-form or stage was administered for the specific subject area (e.g., reading). Accommodations that were typically provided as part of a student's Individualized Education Plan (IEP) or 504 Plan were also provided during administration of the direct assessments upon ECLS-K's approval. The only listed exclusions were Braille and sign language administration. A pilot test found that the alpha reliabilities for the different test forms with about 20 items, each fell within the range of .75 to .80. (Tourangeau et al., 2009).

Direct assessment in math. The math assessment was also conducted in a paper-in-pencil format and administered by a proctor in a group, timed setting of students from the same school. Again this math assessment was based on NAEP standards with a shorter assessment tool and the same procedure as outlined above was followed to ensure content validity. The current study again used a standardized score (i.e., IRT scale score), which was based on probability of answering all of the questions correctly, enabling examination of a student's growth over time. Unlike in kindergarten, only a two-form, or stage (i.e., easy versus hard), test was administered. A pilot test of 30 items for each of the four forms found that the alpha reliabilities were approximately .85.

Grade Point Average (GPA). A parent-Reported his or her child's grade point average in 2006-2007 to date during the spring parent interview. The researcher contacted IES to determine if there is a better means of obtaining a measure of this construct; however, no other sources of data were available. The researcher conducted a correlation between direct measures and GPA to determine inter-test reliability. Ideally, the GPA would be obtained from school

records rather than from parent report. GPA is a five-point scale (A = 4.0, B = 3.0, C = 2.0, D = 1.0, and F = 0.0) and the average score among classes results in an average overall score into two categories (less than 2.0 = 1; 2.0 or above = 2). There are data that suggest that non-accumulative GPA predicts future academic failure (e.g., dropping out; Bowers, 2010). GPA was divided into a binary factor based on a previous longitudinal study that found early elementary school students were twice as likely to graduate if they had obtained A's and B's than males who had C's and D's (Ensminger & Slusarcick, 1992).

Retention as of 2006-2007 school year. The final academic outcome examined was retention as of 2006-2007 school year. If the student had never been retained, then the student should be reported as being in eighth grade (Y = 1, N = 0). Please note there was a small subpopulation of students that may have been academically promoted to a more advanced grade; however, these students were included with the students being on grade level or above. The source of this data was derived 1) from the special education teacher part B questionnaire (for students assigned to a special education teacher), as well as from (2) information collected by the field staff from schools. Retention is a critical outcome to measure, as there is a well-established relation between dropping out and retentions within school (Stearns, Moller, Blau, & Potochnick, 2007).

Early Adolescent Behavioral Adjustment

The current study also examined cumulative parent-reported suspensions from grades kindergarten through eighth grade; parent-reported mental health/educational diagnoses (e.g., ADHD; learning disability) in the spring of 2007 (typically eighth grade for most students), and parent-reported internalizing and externalizing symptoms in eighth grade.

Suspension. Sugai and colleagues (2000) described office discipline referral as “an event in which (a) a student engaged in a behavior that violated a rule or social norm in the school, (b) the problem behavior was observed or identified by a member of the school staff, and (c) the event resulted in a consequence delivered by administrative staff who produced a permanent (written) product defining the whole event” (p. 96). In the current study, the disciplinary data consisted of in or out of school suspensions. In a parent interview, it was reported whether or not a suspension was incurred over the course of the student’s schooling (i.e., kindergarten through eighth grade), which may reflect recall bias. However, no other sources of data were available from the archival data source.

Mental health/educational diagnosis. In the spring of 2007 (round 7), when the majority of students were in eighth grade, parents reported on the phone or in an in-person interview whether a professional diagnosed his or her child with various mental health or educational diagnoses. The data were analyzed in a binary fashion (yes = 0 or no = 1). During this data collection point, students who had low coordination or whose vision was corrected were not considered as a potential disability classification. However, if a Parent-Reported that a student’s vision could not be corrected then the student would be considered to qualify for a disability. Please note that parents were asked in this question if their child ever had been considered as having a disability (Tourangeau et al., 2009). Some of these diagnosis included but were not limited to: (1) learning disability, (2) Attention Deficit-Hyperactivity Disorder (ADHD)/Inattentive type, (3) Attention-Deficit Hyperactive Disorder, (4) “mental retardation” (now referred to as an intellectual disability, and (5) Serious Emotional Disturbance (SED). During round 7, about 25% of parents from the sample did not participate in the interview via phone or in-person.

Mental health symptoms. Parents were interviewed in the spring of 2007 with various questions about their child's mental health. Questions were on a scale of 1 to 3 (1 = not true, 2= somewhat true, 3= certainly true), whereas 7 = refused and 9 = don't know). There was a range of questions but for the current study it was predicted that internalizing and externalizing symptoms would be separately studied. In accordance with kindergarten behavioral data, the symptoms were calculated based on an average of the items for each scale. It should be noted that these items are not part of the Social Skills Rating System, and these items incorporate different items and range of scales (i.e., 3-point scale versus a 4-point, respectively). Exploratory factor analyses were conducted to ensure that the items should be clustered together, and these results are shared within Chapter 4. In line with previous measures, a parent's/guardian's data were included within this measure if two third of the items are completed.

Participants

The participant sample included about 5,700 students from kindergarten through eighth grade when main effect models were conducted. As previously indicated, students from the 1998-1999 kindergarten cohort were followed into 2006-2007 school year when students should be in eighth grade if he or she was on track academically. There are variations in the sample sizes across academic and behavioral outcomes due to missing data that differed across predictors and outcomes. Maximizing the sample size should maximize the power of the study, as participants did not require complete data (e.g., reading and math assessment at both time points, parent interview at both time points, and teacher report in kindergarten). Please note that unweighted there was potentially up to .03% of the remaining student population (30 of 9,725) as of 2006-2007 school year that had been promoted to ninth and tenth grade, and these students were included as part of the current sample (Child Care & Early Education Research

Connections, 2013). Overall, approximately 90% of the potential remaining students were considered at or above grade level. Table 4 provides an overview of participants’ descriptive data for student and family demographics.

Table 4

Unweighted and Weighted Participant Descriptives for Longitudinal Sample

Variable	Unweighted Sample <i>N</i>		Weighted Sample <i>N</i>	
	(<i>n</i> = 9,625)	%	(<i>N</i> = 3,840,785)	%
Male	4,929	50.68%	1,992,193	48.13
Female	4,796	49.32%	1,848,592	51.87%
Caucasian	6,250	64.27%	2,206,779.12	57.46%
Black or African American	1,001	10.29%	654,197.1	17.03%
Hispanic	1,701	17.49%	694,466.7	18.08%
Asian/Pacific Island	554	.06%	115,609.7	3.01%
Native American	318	3.27%	89,118.5	2.32%
Multi-racial	219	2.25%	80,612.88	2.10%
English Language Learner	1,273	13.64%	447,802.1	11.67%
Family SES				
1 st Quintile	1,829	18.81%	666,443.6	17.35%
2 nd Quintile	1,673	17.20%	720,427.6	18.76%
3 rd Quintile	1,838	18.90%	727,839.3	18.95%
4 th Quintile	2,051	21.09%	843,466	21.96%
5 th Quintile	2,334	24%	882,608	22.98%
Eighth Grade IEP Reported	867	8.92%	399,351.8	10.40%
Retention as of Eighth Grade	744	8.40%	482,687.6	12.57%
			(missing 1,044.93)	

Procedure

Obtaining the data base. Data from the public access Early Childhood Longitudinal Study-Kindergarten (ECLS-K) data base were used from the Institute of Education Sciences (IES). When data were electronically obtained from the Educational Data Analysis Tool (EDAT), the researchers exported the data into a statistical analysis package (SPSS version 22). Once approval was obtained from the Institutional Review Board (IRB), the primary researcher screened the data to ensure that all values were within a plausible range. Potential systematic differences were examined between the longitudinal sample (from kindergarten through eighth grade) and the sample lost due to attrition, which are described in the Attrition section and outlined in Appendix C. Then the primary researcher created a separate SPSS file with the designated variables.

Data collection and data entry. The Early Childhood Longitudinal Study-Kindergarten (ECLS-K) was conducted to examine school readiness and early school experience. Please note that the original investigators obtained parental consent for students to be included within the study. These original researchers collected data through computer assisted interviewing for child assessment and parent phone interview, while self-administered questionnaires were used to gather data from teachers, school administrators, and student records. The data collection team consisted of 100 different sites that consisted of one field supervisor and three assessors, who conducted all of the data collection noted above. (For a detailed timeline of data collection and procedures please refer to Tourangeau et al., 2001.) To ensure validity of the examinations, the computer assisted technology was used and field supervisors conducted observations of the assessors in different evaluations scenarios. Moreover, every assessor's 10th parent phone interview (about 10%) was validated by the field supervisor calling to verify demographics and

between eight to ten questions. A field manager also called about 10% of supervisor's assigned schools during the fall and spring kindergarten data point collections. All of the data were screened through computer assisted technology (acceptable range and logic consistency check) and there were manual checks of answers for other to determine if the answers could fit within the existing categories. Westat data entry entered the data and more senior staff validated data at a rate that in the end exceeded 99%. Equivalent procedures were conducted to ensure validity and reliability of results in eighth grade (please see Tourangeau et al., 2009).

Missing data. For the current study, only students who participated in kindergarten and eighth grade were included within the Chapter IV analyses. The researchers ascertained the longitudinal sample by utilizing a longitudinal weight, which caused other cross-sectional students to be excluded as described within the attrition section. As noted above when the current researchers created a summary score for a scale (i.e., early school-related emotional adjustment, internalizing symptoms in eighth grade, and externalizing symptoms in eighth grade), then at least two thirds of the items were needed to be completed per each subscale for inclusion. There are some limitations related to this technique, because if there is a large amount of missing data then correlations can be weakened and standard error bias can result (Bryne, 2001). In spite of this limitation, there was a relatively large sample size, which may diminish some of this potential bias.

Furthermore, to help reduce standard error in general that is associated with using complex, stratified sampling, the current researcher used Taylor Series Linearization, which is a strategy endorsed by the original researchers (NCES, 2013). Hence using Taylor Series Linearization assists with clustered data, as most statistical software typically would treat the data as if simple random sampling had occurred. This is an important consideration because

within clustered samples the data are not independent of one another. The NCES recommends this correction procedure as it reduces the likelihood of making a Type I error, in which a researcher incorrectly rejects the null hypothesis (i.e., suggests that there is a significant result when in reality there is not a significant finding.)

Analysis Plan

Univariate analysis. The current researchers conducted a secondary analysis of the public base year data set (kindergarten year, 1998-1999), in conjunction with the eighth grade data file. There were separate analyses conducted for kindergarten and eighth grade students from the original and longitudinal samples to determine means and standard deviations for the key variables. Additionally, normality was discerned within the longitudinal study by examining skewness and kurtosis. Walker and Maddan (2008) recommend a range of -3.0 and +3.0 for the sample of interest (i.e., longitudinal participants from kindergarten and eighth grade); however, there were values that exceeded these values. More in depth analysis of normality was examined through residual analysis of multiple regression analyses in Table 21 based on consultation with University of South Florida statistical expert, Dr. Dedrick. Please refer to Tables 5 through 8 for descriptive data kindergarten and eighth grade.

Table 5

Means, Standard Deviations, Ranges, Skewness, and Kurtosis of Predictor Variables for Weighted Longitudinal Sample in Kindergarten-

Variable	<i>N</i> *	<i>M</i>	<i>SD</i> **	Range	Skewness	Kurtosis
Early Academic						
Early reading test IRT score	6,276	35.60	187.35	117.44	4.21	50.64
Early math test IRT score	6,596	26.44	172.30	82.72	2.20	24.84
Reading Academic Rating Scale (ARS)	6,511	3.41	14.31	4.00	-.010	11.58
Math (ARS)	6,446	3.59	15.40	4.00	-0.62	10.47
Combined ARS	6,432	3.51	14.27	4.00	-0.48	11.15
First-time K	6,747	.95	3.98	1.00	***	***
Early Behavioral						
Early school-related emotional adaptation	6,745	2.77	.33	2.00	-3.43	24.19
Parent-reported prosocial behavior	6,743	3.32	10.93	3.00	-1.32	9.69
Teacher-reported prosocial behavior	6,358	3.00	11.72	3.00	-.54	8.53
Parent-reported internalizing behaviors	6,740	1.55	7.46	3.00	1.86	14.65
Teacher-report internalizing behaviors	6,511	1.52	.50	3.00	2.27	17.48
Parent-reported externalizing behaviors	6,712	1.97	.39	3.00	1.70	12.96
Teacher-reported externalizing behaviors	6,577	1.63	.64	3.00	3.08	25.96

Note. Higher scores reflect increased levels of the construct indicated by the variable name.

The minimum for early reading test IRT score is 21.01 and maximum score is 138.51.

The minimum for early math test IRT score is 10.51 and maximum score is 93.23.

The minimum for Reading Academic Rating Scale (ARS), Math Academic ARS, and Combined ARS is 1.00 and the maximum score is 5.00.

First-time kindergarten was a minimum of 0 (no) and maximum of 1 (yes).

Early school-related emotional adaptation was a minimum of 1.00 and maximum of 3.00.

Parent-reported prosocial behavior, teacher-reported prosocial behavior, parent-reported internalizing behavior, teacher-reported internalizing behavior, parent-reported externalizing behaviors, and teacher-reported externalizing behaviors has a minimum of 1 and a maximum of 4.

* 3,790,419 is the weighted sample size, which is rounded to the nearest person, as it was a decimal.

** Standard Deviation (SD) derived without strata and cluster applied.

*** skewness and kurtosis were not reported for dichotomous variables, because it is not meaningful to discuss these results for this type of variable

* 3,790,419 is the weighted sample size, which is rounded to the nearest person, as it was a decimal.

Table 6

Means, Standard Deviations, Ranges, Skewness, and Kurtosis of Predictor Variables for Unweighted Cross-Sectional Sample in Kindergarten

Variable	<i>N</i> *	<i>M</i>	<i>SD</i> **	Range	Skewness**	Kurtosis**
Early Academic						
Early reading test IRT score	17,622	35.21	10.20	117.50	2.94	16.31
Early math test IRT score	18,636	25.91	9.10	105.14	1.41	4.19
Reading Academic Rating Scale (ARS)	16,386	3.37	0.80	4.00	0.06	0.12
Math (ARS)	16,242	3.54	0.85	4.00	-0.27	-0.24
Combined ARS	16,190	3.46	0.79	4.00	-0.16	-0.12
First-time K	18,609	0.96	0.21	1.00	***	***
Early behavioral						
Early school-related emotional adaptation	18,065	2.76	10.20	117.50	-1.91	4.02
Parent-reported prosocial behavior	18,026	3.31	0.56	3.00	-0.60	-0.24
Teacher-reported prosocial behavior	18,242	2.96	0.63	3.00	-0.14	-0.67
Parent-reported internalizing behaviors	18,010	1.55	0.41	3.00	1.08	2.02
Teacher-reported internalizing behaviors	18,696	1.55	.53	3.00	1.29	2.14
Parent-reported externalizing behaviors	17,902	1.97	0.69	3.00	0.73	0.34
Teacher-reported externalizing behaviors	18,951	1.63	0.64	3.00	1.21	1.33

Note. Higher scores reflect increased levels of the construct indicated by the variable name.

The minimum for early reading test IRT score = 21.01 and maximum score = 138.51.

The minimum for early math test IRT score = 10.51 and maximum score = 115.65.

The minimum for Reading Academic Rating Scale (ARS), Math Academic ARS, and Combined ARS = 1.00 and the maximum score = 5.00.

First-time kindergarten was a minimum of 0 (no) and maximum of 1 (yes).

Early school-related emotional adaptation was a minimum of 1.00 and maximum of 3.00.

Parent-reported prosocial behavior, teacher-reported prosocial behavior, parent-reported internalizing behavior, teacher-reported internalizing behavior, parent-reported externalizing behaviors, and teacher-reported externalizing behaviors was a minimum of 1 and a maximum of 4.-

* Sample size for unweighted cross sectional kindergarten sample was 16,190-18,951.

** Standard Deviation (SD), skewness, and cluster were derived without strata and cluster applied.*** skewness and kurtosis were not reported for dichotomous variables, because it is not meaningful to discuss these results for this type of variable

Table 7

Means, Standard Deviations, Ranges, Skewness, and Kurtosis of Weighted Outcome Variables for Longitudinal Sample in Eighth Grade

Variable	<i>N</i> *	<i>M</i>	<i>SD</i> **	Range	Skewness**	Kurtosis**
Academic Outcomes						
Reading IRT	6,276	168.79	557.05	122.27	-1.62	8.20
Math IRT	6,596	140.64	453.64	106.03	-1.81	11.13
GPA (Recoded into less than 2.0 = 0; 2.0+ = 1)	6,540	.97	3.40	1.00	***	***
Retention (Recoded into Y/N = 1/0)	6,749	.13	6.61	1.00	***	***
Behavioral Outcomes						
Suspension (Recoded into Y/N = 1/0)	6,648	.17	7.87	1.00	***	***
Ed. or M.H. Diagnosis (Recoded into Y/N = 1/0)	6,651	.18	8.13	1.00	***	***
Int'l Bx	6,642	1.29	6.46	2.00	2.87	17.62
Ext'l Bx	6,641	1.37	7.39	2.00	2.74	18.03

Note. Higher scores reflect increased levels of the construct indicated by the variable name.

The minimum for Reading IRT = 86.63 and maximum = 208.90.

The minimum for Math IRT = 67.42 and maximum = 172.20.

GPA is a minimum of 0 ($x < 2.00$) or 1 ($x \geq 2.00$)

Retention was a minimum of 0 (no) and maximum of 1 (yes).

Suspension was a minimum of 0 (no) and a maximum of 1 (yes).

Internalizing and externalizing behavior was a minimum of 1 and a maximum of 3.

* 3,790,419 is the weighted sample size, which is rounded to the nearest person, as it was a decimal.

** Standard Deviation (SD), skewness, and cluster were derived without strata and cluster applied.

*** skewness and kurtosis were not reported for dichotomous variables, because it is not meaningful to discuss these results for this type of variable

Table 8

Means, Standard Deviations, Ranges, Skewness, and Kurtosis of Unweighted Outcome Variables for Longitudinal Sample in Eighth Grade

Variable	<i>N</i>	<i>M</i>	<i>SD</i> **	Range	Skewness**	Kurtosis**
Academic Outcomes						
Reading IRT	9,225	171.05	27.59	123.28	-0.94	0.15
Math IRT	9,285	142.22	22.09	106.03	-0.89	0.29
GPA (Recoded into less than 2.0 = 0; 2.0+ = 1)	8,512	.98	.15	1.00	***	***
Retention (Recoded into Y/N = 1/0)	9,722	0.11	.30	1.00	***	***
Behavioral Outcomes						
Suspension (Recoded into Y/N = 1/0)	8,648	0.13	0.34	1.00	***	***
Ed. or M.H. Diagnosis (Recoded into Y/N = 1/0)	8,646	0.16	0.36	1.00	***	***
Int'l Bx	8,625	1.27	0.30	2.00	1.68	3.25
Ext'l Bx	8,623	1.34	0.33	2.00	1.40	2.21

Note. Higher scores reflect increased levels of the construct indicated by the variable name.

The minimum for Reading IRT = 85.62 and maximum = 208.90.

The minimum for Math IRT = 66.17 and maximum = 172.20.

GPA is a minimum of 0 ($x < 2.00$) or 1 ($x \geq 2.00$)

Retention was a minimum of 0 (no) and maximum of 1 (yes).

Suspension was a minimum of 0 (no) and a maximum of 1 (yes).

Internalizing and externalizing behavior was a minimum of 1 and a maximum of 3.

** Standard Deviation (SD), skewness, and cluster were derived without strata and cluster applied.

*** skewness and kurtosis were not reported for dichotomous variables, because it is not meaningful to discuss these results for this type of variable

Bivariate analysis. Research Question 1: How are early variables related to:

(a) each other in a sample of youth in kindergarten?

(b) early *academic* variables (teachers' ratings of reading and math, direct cognitive assessment scores in reading and math)?

c) early *behavioral* (i.e., early school-related emotional adaptation, prosocial behaviors, internalizing behaviors, and externalizing behaviors)?

The researcher calculated Pearson-product moment correlations to determine the strength and relational direction (negatively or positively sloped) using SAS 9.3 with the appropriate ECLS-K weights (C1_7FP0) applied within these analyses. (As described above, applying these weights limits the analysis to the longitudinal dataset.) The researcher established a priori alpha criterion of .05 to determine when the null hypothesis should be rejected and the most significant findings are reported based on the effect size in Chapter 4. (Notably there were are differences in the variables measured at each time point and in some cases the same variable is measured with a different measurement tool.) Using this analysis, should help offset multicollinearity, or a substantial overlap in predictors, which makes it difficult to estimate the contribution of each predictor (Pedhazur, 1997). If correlations between predictors were found to be high (i.e., above .65) and theoretically align then the researcher combined these constructs. It is important to note that exploratory factor analyses were also used as preliminary analyses to verify items per construct for early school-related emotional adaptation in kindergarten and mental health symptoms in eighth grade. Through preliminary analyses, multiple regression, and logistic regression, the current study's findings should more accurately pinpoint protective and risk factors over time.

Multiple regression and logistic regression analyses. Research Question 2: Controlling for demographic variables, how are early *behavioral* variables (i.e., early school-related emotional adaptation, prosocial behaviors, externalizing behaviors, and internalizing behaviors) and early academic variables (basic reading test, Academic Rating Scales, and basic math test) related to:

- a) academic outcomes in eighth grade (achievement in reading and math; grades, and retention as 2006-2007 school year)?
- (b) school discipline outcomes across time (presence or absence of suspensions from kindergarten-eighth grade)?
- (c) eighth grade mental health/educational outcomes (presence or absence of internalizing and externalizing symptomology)?

Research Question 3: To what extent, if any, are the relations between early behavioral variables and eighth grade academic, school discipline, and mental health/educational outcomes moderated by demographic variables measured in kindergarten (e.g., gender) and, if so, how?

Multiple regression models and logistic regression models were created with predictor blocks entered on a conceptual basis. There are some assumptions that are related to each types of regression. According to Osborne and Waters (2002), some major assumptions of multiple regression are: (1) independence of observations, (2) normal distribution of the residuals, (3) homoscedasticity (i.e., variance of errors is consistent across independent variables across all levels), and (4) linear relations between independent and dependent variables. The current study generally met the independence of observations as students were sampled from different systems, primary and secondary schools, which may reduce the extent of nested data. As discussed in the univariate analyses, normality was examined through skewness and kurtosis values were examined among the longitudinal study. (Please see Chapter 3, Univariate analysis). The third assumption of homoscedasticity was examined through examining residuals for multiple regression equations. Additionally, there should be an absence of multicollinearity, which was examined through correlations. The last assumption was assessed through a visual analysis of scatterplots of the data.

Logistic regression has some similar assumptions as regression, while the other assumptions vary from multiple regression. The same, underlying assumption relates to research design of independence of observations. Also there was a need to have an absence of multicollinearity, which was examined through an initial analysis of correlations (Stoltzfus, 2011).

Once these assumptions were considered, first control factors (background variables: child/family characteristics and early academic variables) were entered. The next predictor blocks consisted of the major variables and were entered as main effects (i.e., first predictor block 3: early behavioral resiliency factors, followed by predictor block 4: early behavioral risk factors). Lastly, interactions between the main effect (risk or resiliency factor) and the child/family control variables were entered to determine if there were any significant interactions present.

Model construction. The predicted outcome data included academic and behavioral adjustment. The conceptual model was presented in Figure 1. Several models were created to examine which specific behavioral and demographic characteristics would predict long-term academic and behavioral outcomes in the spring of 2007 (typically eighth grade). Although eighth grade is noted as the grade outcome in each table in Chapter 4, there some students are in different grades due to being retained but who were still followed within the study. Moreover, a small sample of students who were placed beyond eighth grade (i.e., 9th and 10th grade) were included within the sample. The researcher simultaneously entered the grand mean centered predictor variables (including background, behavioral risk and protective factors, and interactions) into the fourth models to determine moderators, which may heighten risk or enhance protection. This prospective, multiple regression model with independent predictors in

kindergarten was used to predict the likelihood of academic and behavioral outcomes in eighth grade.

The following model was used. Please see below. If there are no significant interactions from the tested models, then the final model with all main effects was featured.

$$y_i = \beta_0 + \text{Block 1: Demographics} + \text{Block 2: Early Academics} + \text{Block 3: Behavioral Resiliency variables} + \text{Block 4: Behavioral Risk variables} + \text{Block 5: Interactions} + \varepsilon_i$$

Whereas, y_i is the outcome that depends on the predictor variables

β_0 = intercept

x = explanatory variables

ε_i = deviations are normally distributed with a mean of zero.

Multiple regression and logistic regression equations. The researcher carried out model construction for prospective regressions with hierarchical block entry for multiple and logistic regression. The researcher began model construction by starting with the control variables (background variables of child/family characteristics and early academic factors), then entering the main effects of early behavioral resiliency factors, and lastly including the early risk behavioral factors.

Model 1: The aim of model 1 was to examine the effects of student-related factors in kindergarten on the dependent outcomes (i.e., the separate academic outcomes and behavioral outcomes in eighth grade). The first block consisted of the student/family demographic variables (e.g., child's gender, SES composite, and race).

The equation can be found below:

$$y_i = \beta_0 + \beta_1 \text{Gender}_{i1} + \beta_2 \text{SES}_{i2} + \beta_3 \text{Racial/Ethnic}_{i3} + \varepsilon_i$$

where

β_0 is the overall intercept,

$\beta_1 \text{Gender}_{i1}$ is the gender of the student,

$\beta_2 \text{SES}_{i2}$ is the family SES composite category the family falls within,

$\beta_3 \text{Racial/Ethnic}_{i3}$ is the racial/ethnic student classification,

ϵ_i is the random effect

Model 2: In the second model the early academic variables (direct assessment in reading, direct testing in math, Combined Academic Rating Scale in reading and math) were entered into the logistic or multiple regression equation. The equation can be found below:

$$y_i = \beta_0 + \beta_4 \text{ReadingAssmt}_{i4} + \beta_5 \text{MathAssmt}_{i5} + \beta_6 \text{ARSCombined}_{i6} + \epsilon_i$$

where

β_0 is the overall intercept,

$\beta_4 \text{ReadingAssmt}_{i4}$ is a student's direct reading test IRT score in kindergarten,

$\beta_5 \text{MathAssmt}_{i5}$ is student's direct math test IRT score in kindergarten,

$\beta_6 \text{ARSCombined}_{i6}$ is an average of the teacher's rating of a student in reading and math in kindergarten based on the high correlation between math and reading (ARS) scales,

ϵ_i is the random effect

Model 3: demographics and early academics were the variables entered into the third model for multiple and logistic regression. The equation can be found below:

$$y_i = \beta_0 + \beta_1 \text{Gender}_{i1} + \beta_2 \text{SES}_{i2} + \beta_3 \text{Racial/Ethnic}_{i3} + \beta_4 \text{ReadingAssmt}_{i4} + \beta_5 \text{MathAssmt}_{i5} + \beta_6 \text{ARSCombined}_{i6} + \epsilon_i$$

where

β_0 is the overall intercept,

$\beta_1 \text{Gender}_{i1}$ is the gender of the student,

$\beta_2 \text{SES}_{i2}$ is the family SES composite category the family falls within,

$\beta_3 \text{Racial/Ethnic}_{i3}$ is the racial/ethnic student classification,

$\beta_4 \text{ReadingAssmt}_{i4}$ is a student's direct reading test IRT score in kindergarten,

$\beta_5 \text{MathAssmt}_{i5}$ is student's direct math test IRT score in kindergarten,

$\beta_6 \text{ARSCombined}_{i6}$ is an average of the teacher's rating of a student in reading and math in kindergarten based on the high correlation between math and reading (ARS) scales,

ϵ_i is the random effect

Model 4: early academics and parent and teacher-reported early resiliency behavior were entered for the fourth model for logistic and multiple regression equations. The equation can be found below:

The equation can be found below:

$$y_i = \beta_0 + \beta_4 \text{ReadingAssmt}_{i4} + \beta_5 \text{MathAssmt}_{i5} + \beta_6 \text{ARSCombined}_{i6} + \beta_7 \text{SchAd}_{i7} +$$

$$\beta_8 \text{Pprosocialbeh}_{i8} + \beta_9 \text{Tprosocialbeh}_{i9} + \epsilon_i$$

where

β_0 is the overall intercept,

$\beta_4 \text{ReadingAssmt}_{i4}$ is a student's direct reading test IRT score in kindergarten,

$\beta_5 \text{MathAssmt}_{i5}$ is student's direct math test IRT score in kindergarten,

β_6 ARSCombined_{i6} is an average of the teacher's rating of a student in reading and math in kindergarten based on the high correlation between math and reading (ARS) scales,

β_7 SchAd_{i7} is parent-reported early school related emotional adaptation,

β_8 Pprosocialbeh_{i8} is parent-reported prosocial behavior,

β_9 PInternalizing_{i9} are parent-reported internalizing behaviors,

ϵ_i is the random effect

Model 5: early academics as well as parent and teacher-reported early risk behavior were entered for the fifth model for logistic and multiple regression equations. The equation can be found below:

$$y_i = \beta_0 + \beta_4 \text{ReadingAssmt}_{i4} + \beta_5 \text{MathAssmt}_{i5} + \beta_6 \text{ARSCombined}_{i6} + \beta_9 \text{PInternalizing}_{i9} + \beta_{10} \text{TInternalizing}_{i10} + \beta_{11} \text{PExternalizing}_{i11} + \beta_{12} \text{TExternalizing}_{i12} + \epsilon_i$$

where

β_0 is the overall intercept,

β_4 ReadingAssmt_{i4} is a student's direct reading test IRT score in kindergarten,

β_5 MathAssmt_{i5} is student's direct math test IRT score in kindergarten,

β_6 ARSCombined_{i6} is an average of the teacher's rating of a student in reading and math in kindergarten based on the high correlation between math and reading (ARS) scales,

β_9 PInternalizing_{i9} are parent-reported internalizing behaviors,

β_{10} TInternalizing_{i10} are teacher-reported internalizing behaviors,

β_{11} PExternalizing_{i11} are parent-reported externalizing behaviors,

β_{12} TExternalizing_{i12} are teacher-reported externalizing behaviors,

ϵ_i is the random effect

Model 7: consists of demographics and early behavioral resiliency factors (parent-reported and teacher-reported prosocial behavior and early school adjustment) in the regression and logistic equations. The equation can be found below:

$$y_i = \beta_0 + \beta_1 \text{Gender}_{i1} + \beta_2 \text{SES}_{i2} + \beta_3 \text{Racial/Ethnic}_{i3} + \beta_7 \text{SchAd}_{i7} + \beta_8 \text{Pprosocialbeh}_{i8} + \beta_9 \text{Tprosocialbeh}_{i9} + \epsilon_i$$

where

β_0 is the overall intercept,

β_1 Gender_{i1} is the gender of the student,

β_2 SES_{i2} is the family SES composite category the family falls within,

β_3 Racial/Ethnic_{i3} is the racial/ethnic student classification,

β_7 SchAd_{i7} is parent-reported early school related emotional adaptation,

β_8 Pprosocialbeh_{i8} is parent-reported prosocial behavior,

β_9 PInternalizing_{i9} are parent-reported internalizing behaviors,

ϵ_i is the random effect

Model 8: parent and teacher-reported early risk behavioral, as well as parent and teacher-reported early resiliency behavior, were entered for the eighth model for logistic and multiple regression equations. The equation can be found below:

$$y_i = \beta_0 + \beta_7 \text{SchAd}_{i7} + \beta_8 \text{Pprosocialbeh}_{i8} + \beta_9 \text{Tprosocialbeh}_{i9} + \beta_9 \text{PInternalizing}_{i9} + \beta_{10} \text{TInternalizing}_{i10} + \beta_{11} \text{PExternalizing}_{i11} + \beta_{12} \text{TExternalizing}_{i12} + \varepsilon_i$$

where

β_0 is the overall intercept,

$\beta_7 \text{SchAd}_{i7}$ is parent-reported early school related emotional adaptation,

$\beta_8 \text{Pprosocialbeh}_{i8}$ is parent-reported prosocial behavior,

$\beta_9 \text{PInternalizing}_{i9}$ are parent-reported internalizing behaviors,

$\beta_{10} \text{TInternalizing}_{i10}$ are teacher-reported internalizing behaviors,

$\beta_{11} \text{PExternalizing}_{i11}$ are parent-reported externalizing behaviors,

$\beta_{12} \text{TExternalizing}_{i12}$ are teacher-reported externalizing behaviors,

ε_i is the random effect

Model 9: parent and teacher-reported early risk behavior were entered into model 9 for logistic and multiple regression equations. The equation can be found below:

$$y_i = \beta_0 + \beta_9 \text{PInternalizing}_{i9} + \beta_{10} \text{TInternalizing}_{i10} + \beta_{11} \text{PExternalizing}_{i11} + \beta_{12} \text{TExternalizing}_{i12} + \varepsilon_i$$

where

β_0 is the overall intercept,

$\beta_9 \text{PInternalizing}_{i9}$ are parent-reported internalizing behaviors,

$\beta_{10} \text{TInternalizing}_{i10}$ are teacher-reported internalizing behaviors,

$\beta_{11} \text{PExternalizing}_{i11}$ are parent-reported externalizing behaviors,

β_{12} TExternalizing_{i12} are teacher-reported externalizing behaviors,

ϵ_i is the random effect

Model 10: demographics and early risk behavior were entered into logistic and multiple regression equations. The equation can be found below:

$$y_i = \beta_0 + \beta_1 \text{Gender}_{i1} + \beta_2 \text{SES}_{i2} + \beta_3 \text{Racial/Ethnic}_{i3} + \beta_9 \text{PInternalizing}_{i9} +$$

$$\beta_{10} \text{TInternalizing}_{i10} + \beta_{11} \text{PEexternalizing}_{i11} + \beta_{12} \text{TExternalizing}_{i12} + \epsilon_i$$

where

β_0 is the overall intercept,

β_1 Gender_{i1} is the gender of the student,

β_2 SES_{i2} is the family SES composite category the family falls within,

β_3 Racial/Ethnic_{i3} is the racial/ethnic student classification,

β_9 PInternalizing_{i9} are parent-reported internalizing behaviors,

β_{10} TInternalizing_{i10} are teacher-reported internalizing behaviors,

β_{11} PEexternalizing_{i11} are parent-reported externalizing behaviors,

β_{12} TExternalizing_{i12} are teacher-reported externalizing behaviors,

ϵ_i is the random effect

Model 11: is the main effect model that includes demographics, early academics, early behavioral resiliency factors, and early risk behavioral factors that were entered into the logistic and multiple regression equations. The equation construction can be found below:

$$y_i = \beta_0 + \beta_1 \text{Gender}_{i1} + \beta_2 \text{SES}_{i2} + \beta_3 \text{Racial/Ethnic}_{i3} + \beta_4 \text{ReadingAssmt}_{i4} + \beta_5 \text{MathAssmt}_{i5} +$$

$$\beta_6 \text{ARSCombined}_{i6} + \beta_7 \text{SchAd}_{i7} + \beta_8 \text{Pprosocialbeh}_{i8} + \beta_9 \text{Tprosocialbeh}_{i9} +$$

$$\beta_9 \text{PInternalizing}_{i9} + \beta_{10} \text{TInternalizing}_{i10} + \beta_{11} \text{PExternalizing}_{i11} + \beta_{12} \text{TExternalizing}_{i12} + \varepsilon_i$$

where

β_0 is the overall intercept,

$\beta_1 \text{Gender}_{i1}$ is the gender of the student,

$\beta_2 \text{SES}_{i2}$ is the family SES composite category the family falls within,

$\beta_3 \text{Racial/Ethnic}_{i3}$ is the racial/ethnic student classification,

$\beta_4 \text{ReadingAssmt}_{i4}$ is a student's direct reading test IRT score in kindergarten,

$\beta_5 \text{MathAssmt}_{i5}$ is student's direct math test IRT score in kindergarten,

$\beta_6 \text{ARSCombined}_{i6}$ is an average of the teacher's rating of a student in reading and math in kindergarten based on the high correlation between math and reading (ARS) scales,

$\beta_7 \text{SchAd}_{i7}$ is parent-reported early school related emotional adaptation,

$\beta_8 \text{Pprosocialbeh}_{i8}$ is parent-reported prosocial behavior,

$\beta_9 \text{PInternalizing}_{i9}$ are parent-reported internalizing behaviors,

$\beta_{10} \text{TInternalizing}_{i10}$ are teacher-reported internalizing behaviors,

$\beta_{11} \text{PExternalizing}_{i11}$ are parent-reported externalizing behaviors,

$\beta_{12} \text{TExternalizing}_{i12}$ are teacher-reported externalizing behaviors,

ε_i is the random effect

Model 12 and subsequent interaction models: Prospective multiple and logistic regressions used centered predictor variables by subtracting the group mean from each individual's score on the specific continuous variable (e.g., early school-related emotional adaptation, internalizing problems, and externalizing problems in kindergarten). Aiken and West (1991) support this technique, as it has several advantages including: simplifying decomposition, interpreting interactions, and reducing multicollinearity. An a priori alpha level of .05 was established as statistically significant. Potential moderators are outlined in Model 12 in the Tables below. An example is:

Suspension = Early Externalizing Behaviors + Gender + Early Externalizing Behaviors x Gender

Deciphering interactions: If there were any significant moderating relations present then these results were entered into an equation to understand the patterns of the moderator. The researcher entered the constant value of zero for the intercept of eighth grade behavioral outcomes (e.g., internalizing and externalizing concerns) and the unstandardized coefficients of each of the centered variables and interaction terms. Centered values were used to facilitate interpretation of interactions.

Implications

This study has implications for research, practice, and policy. From a research perspective, it is important to know if these variables are highly intercorrelated because when predicting future outcomes, it may not be necessary to collect data on all of these variables. When there is high multicollinearity, including multiple variables in a model does not necessarily improve the precision of the prediction. Consequently, determining which variables provide the most unique contribution will enable future research to focus on variables with the highest impact rather than expending energy and funds on collecting data on other less significant

variables. In terms of applied practice, it would be informative to know which variables are most important to screen for in kindergarten and whether one could focus in on particular variables as the best predictors of future school success.

Lastly, the research study has important implications for policy. Clearly school failure has broad implications for individuals and society as a whole. Policies have been established to increase schools' accountability and recent advocacy for legislature conceptualizes a more comprehensive version of potential learning barriers, including social and emotional learning (SEL). In order to promote optimal achievement for all students, there is a need to identify central risk and protective factors early in children's schooling (e.g., Alexander et al., 1997). Honing in on factors to detect vulnerability can expand the current knowledge base, which may eventually lead to change in the focus of screening tools. Increasing specificity in kindergarten factors should enhance early detection of negative school trajectories, as extant research has mainly focused on predictors in secondary schools (Hickman et al., 2008). If data indicate early behavioral problems are related to maladjustment in eighth grade (i.e., academic and behavioral), then allotting more resources to SEL should be considered (e.g., Schoolwide Positive Behavioral Support (SWPBS; Sugai & Horner, 2002). The current study aimed to identify risk and protective factors, with the hope of informing target areas for early prevention and intervention services to offset potentially negative academic and behavioral trajectories.

Chapter 4: Results

This chapter describes the results of the study. First, preliminary analyses are presented, including (a) skewness and kurtosis for each variable, (b) the factor structure of the parent eighth grade mental health rating scale, (c) correlations between demographic and outcome variables, and (d) correlations between predictor and outcome variables. Second, correlations among variables are presented. Finally, the results of the logistic and multiple regression analyses are described.

Preliminary Analyses

Preliminary analyses were conducted to examine the normality of the distribution for each of the variables. Additionally, a factor analysis was conducted to examine the number of factors on the parent rating of mental health concerns in eighth grade. Finally, correlations between demographic and outcome variables and between predictor and outcome variables were examined.

Normality. Descriptive statistics of normality for the longitudinal dataset are displayed in Tables 4 and 5 in Chapter 3. Skewness and kurtosis of the predictor and outcome variables were calculated to evaluate univariate normality. The values shown below are based on the unweighted data.

In terms of predictors, the Math Academic Rating Scale (ARS), Reading ARS, Combined ARS, parent-reported prosocial behavior, teacher-reported prosocial behavior, and parent-reported externalizing behavior were within a normal distribution of between -1 and +1. However, early reading IRT test (skewness = 2.94, kurtosis = 16.31), early math IRT test score

(skewness = 1.41, kurtosis = 4.19), and first time-kindergarten (skewness = - 4.28, kurtosis = 16.31) did not fall within a normal distribution. In terms of eighth grade outcomes, reading IRT and math IRT had approximately normal score distributions. Parent-reported GPA (skewness = - 6.26, kurtosis = 37.19), retention (skewness = 2.64, kurtosis = 4.97), presence or absence of suspension (skewness = 2.16, kurtosis = 2.65), educational or mental health diagnosis (skewness = 1.91, kurtosis = 1.63), internalizing behavior (skewness = 1.68, kurtosis = 3.25), and externalizing behavior (skewness = 1.40, kurtosis = 2.21) did not fall within a normal distribution. Although some skewness and kurtosis indicated some departures from normality, these raw data were not transformed as per Walker and Maddan (2008) as most values fell within an acceptable range of -3.0 and +3.0. Tables 7 and 8 shows the means and standard deviations for the longitudinal sample.

Exploratory factor analysis. Exploratory Factor Analysis (EFA) was conducted in order to determine the number of dimensions on the parent rating of mental health concerns in eighth grade. A factor was extracted when a factor's Eigenvalue was greater than 1. The analysis yielded two factors of externalizing symptoms and internalizing symptoms with an eigenvalue of 6.62 and 1.82, respectively, as shown in Table 9. Moreover, the Comparative Fit Index (CFI) of .93 for the two-factor model also supported this factor structure. This two-factor structure is also supported by the Standardized Root Mean Square Residual (SRMR) value of .06, which falls below .08. Externalizing symptoms accounted for 41.35% and internalizing symptoms accounted for 11.39% of the variance. All factor loadings were above .38 on their primary factor for externalizing symptoms, as well above .44 on the primary factor for internalizing symptoms. No item loaded onto another factor at greater than .35. The factor analysis was run again with nonvarimax rotation, and similar results were found. The externalizing symptoms and

internalizing symptoms both had moderate internal consistency reliability values, with Cronbach's alphas of .69 and .78, respectively. Table 9 and Table 10 show the factor loadings for internalizing and externalizing symptoms for varimax and oblique rotations, respectively.

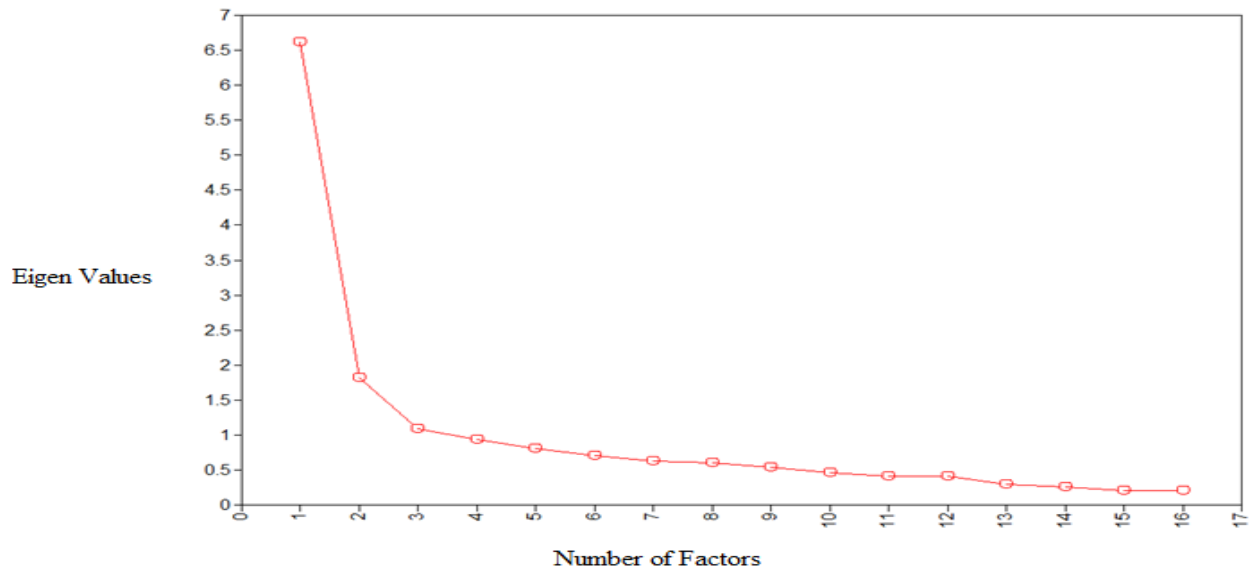


Figure 2. Eigenvalues for Eighth Grade Parent Rating of Mental Health Symptoms

Table 9

Factor Loadings for Eighth Grade Externalizing and Internalizing Symptoms for Cross-Sectional Sample Using Varimax Rotation (N = 8,587)

Item	Externalizing Symptoms Factor Loading	Internalizing Symptoms Factor Loading
1....is restless, overactive, cannot stay still for long	0.77	
2....often loses {his/her} temper	0.38	
3....is constantly fidgeting or squirming	0.80	
4.... often fights with other youth or bullies them	0.45	
5...is easily distracted, concentration wanders	0.81	
6 ...thinks things through before acting*	0.68	
7.... often lies or cheats	0.56	
8.... steals from home, school, or elsewhere	0.61	
9...has a good attention span, sees work through to the end *	0.85	
10.... often complains or headaches, stomachaches or sickness.		0.45

Table 9 (Continued)

Item	Externalizing Symptoms Factor Loading	Internalizing Symptoms Factor Loading
11...would rather be alone than with other youth.		0.48
12...has many worries or often seems worried.		0.78
13... is often unhappy, depressed, or tearful		0.73
14. ... is nervous in new situations, easily loses confidence		0.56
15...is picked on or bullied by other youth		0.44
16. ...has many fears, easily scared		0.72

Note. $\alpha = 0.69$ for externalizing symptoms and $\alpha = 0.78$ for internalizing symptoms.

* Denotes a reverse-scored item.

Table 10

Factor Loadings for Eighth Grade Externalizing and Internalizing Symptoms for Cross-Sectional Sample Using Oblique Rotation (N = 8,587)

Item	Externalizing Symptoms Factor Loading	Internalizing Symptoms Factor Loading
1...is restless, overactive, cannot stay still for long	0.73	
2...often loses {his/her} temper	0.45	
3...is constantly fidgeting or squirming	0.78	
4... often fights with other youth or bullies them	0.51	
5...is easily distracted, concentration wanders	0.79	
6 ...thinks things through before acting*	0.64	
7... often lies or cheats	0.58	
8... steals from home, school, or elsewhere	0.61	
9...has a good attention span, sees work through to the end *	0.85	
10.... often complains or headaches, stomachaches or sickness.		0.45
11...would rather be alone than with other youth.		0.48
12...has many worries or often seems worried.		0.78
13... is often unhappy, depressed, or tearful		0.73
14. ... is nervous in new situations, easily loses confidence		0.56
15...is picked on or bullied by other youth		0.44
16. ...has many fears, easily scared		0.72

Note. $\alpha = 0.69$ for externalizing symptoms and $\alpha = 0.78$ for internalizing symptoms.

* Denotes a reverse-scored item.

Correlations between variables. Pearson product-moment correlations were calculated for demographic and outcome variables as well as for predictor and outcome variables. Tables 9 and 10 show these correlations, respectively. For measures that were the same type of variable (predictor), conceptually alike, and had at least a correlation of .70, the researcher planned to

combine these into one overarching variable. Since no correlations met these criteria, no outcomes were combined and they remained independent.

Correlations between predictor and outcome variables. There were several significant correlations found between demographic and outcome variables. For example, there was a strong, significant correlation between parent-reported internalizing and externalizing symptoms in eighth grade ($r = .49, p < .001$). There was a moderate positive correlation between Black students and presence of suspensions during the period from kindergarten through eighth grade ($r = .38, p < .001$). There was a strong, positive correlation found between socioeconomic status composite reported in kindergarten and performance on standardized tests for eighth grade reading ($r = .43, p < .001$) and eighth grade math ($r = .44, p < .001$).

Several significant interrelations were found between predictor and outcome variables in the current study. Notably, strong relations were found between early standardized reading scores and eighth grade standardized reading scores ($r = .46, p < .001$), as well as between early standardized math scores and eighth grade standardized math scores ($r = .58, p < .001$). Combined ARS scores were negatively associated with retention ($r = -.32, p < .001$). There was a weak negative correlation between teacher rated prosocial behavior in kindergarten and presence of a suspension that were reported as occurring between kindergarten and eighth grade ($r = -.15, p < .001$). Table 11 shows all correlations between predictor variables and outcome variables.

Table 11

Correlations of Predictor Variables and Outcome Variables

Variable	Eighth grade GPA (1 = greater than 2.0; 0 = less than 2.0)	Direct reading test in eighth grade	Direct math test in eighth grade	Retention as of 2006 (1 = yes; 0 = no)	Suspen sion (yes = 1; no = 0)	Parent-reported educational or mental health diagnosis (1 = yes, 0 = no)	Parent- reported internalizing concerns in eighth grade	Parent - reported externalizing bx in eighth grade
Gender	-.08***	-.012***	0.01	.11***	.21***	.12***	0.01	.19***
SES in K	.15***	.43***	.44***	-.20***	.15***	-.06***	-.09***	-.17***
Hispanic	-.05***	-.13***	-.09***	-.03**	.04***	-.04***	0.01	-.05***
Black	-.02*	-.30***	-.30***	.14***	.21***	-0.01	-0.02	.10***
Native American	0.01	-.03*	-.03*	0.01	0.02	-0.01	-0.01	-0.02
Asian	0.02	.06***	.07***	-.03**	.06***	-.05***	-.05***	-.07***
Multi- Racial	0.02	.03*	0.01	-0.01	0.01	.02*	-0.02	0.01
Early reading test IRT score	.07***	.46***	.44***	-.24***	.14***	-.17***	-.13***	-.20***
Early math test IRT score	-.21***	.54***	.58***	-.29***	.13***	-.17***	-.15***	-.20***
Combined ARS	.08***	.46***	.47***	-.32***	.09***	-.22***	-.14***	-.21***
1st time kindergart en (Y = 1; N = 0)	0.02	.05***	.07***	0.02	-.04**	-.11***	-.09***	-.07***
Early school- related emotional adaptation	.04**	.10***	.12***	-.11***	.05***	-.11***	-.16***	-.14***
Parent- reported prosocial behavior K	.05***	.12***	.12***	-.07***	0.01	-.06***	-.11***	-.07***
Teacher- reported prosocial behavior K	.03*	.23***	.21***	-.18***	-.15***	-.19***	-.15***	-.25***
Parent- reported internalizi ng behaviors K	0.01	-.04**	-.06***	.05***	.04**	.12***	.21***	.15***
Teacher- reported internalizi ng behaviors K	-0.02	-.14***	-.14***	.10***	.04**	.10***	.11***	.07***
Parent- reported externalizi ng behaviors K	-.06***	-.21***	-.17***	.13***	.20***	.20***	.17***	.38***

Table 11 (continued)

Variable	Eighth grade GPA (1 = greater than 2.0; 0 = less than 2.0)	Direct reading test in eighth grade	Direct math test in eighth grade	Retention as of 2006 (1 = yes; 0 = no)	Suspen sion (yes = 1; no = 0)	Parent-reported educational or mental health diagnosis (1 = yes, 0 = no)	Parent- reported internalizing concerns in eighth grade	Parent - reported externalizing bx in eighth grade
Teacher- reported externalizi ng behaviors	-.05***	-.20***	-.17***	.15***	.22***	.24***	.13***	.33***
Gender	-.08***	-.12***	0.01	.11***	.21***	.12***	0.01	.19***
SES in K	.15***	.46***	.44***	-.20***	-.15***	-.06***	-.09***	-.17***
Asian	.02	.06***	.07***	-.03**	-.06***	-.05***	-.05***	-.07***
Black	-.02*	-.30***	-.30***	.14***	.21***	-.01	-.02	.10
Hispanic Native American	-.05***	-.13***	-.09***	-.03***	-.04***	-.04***	.01	-.05***
Multi- Racial	.01	-.03*	-.03*	.01	.02	-.01	-.01	-.02
	.02	.03*	.01	-.01	.01	.02*	-.02	.01

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. bx = behavior

Research Question 1: Correlational Analyses

Research question 1 focused on how the predictor variables were related to each other. The purpose of this analysis was to examine correlations in order to consider multicollinearity. Pearson product-moment correlation results are listed for predictor variables in Table 12 for the longitudinal sample. There was a strong correlation between kindergarten academic rating scales in the spring of kindergarten (math and reading; $r = .84, p < .001$). These ARS measures were collapsed due to the high correlation and conceptual similarities and are subsequently referred to as the Combined Academic Rating Scale (an average of reading and math). All other predictor variables remained separate, as the threshold of $r = .70$ was not met for any other variables.

Table 12

Correlations among Predictor Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Early academic protective factors:															
1. Early reading test IRT score	1	.69***	.57***	.48***	.55***	-.07***	.10***	.09***	.21***	-.05***	-.11***	-.18***	-.14***	-.10***	.39***
2. Early math test IRT score		1	.58***	.54***	.58***	-.02*	.11***	.15***	.24***	-.05***	-.15***	-.15***	-.13***	-.01	.43***
3. Reading Academic Rating Scale (ARS)			1	.84***	.95***	.04***	.12***	.16***	.35***	-.06***	-.20***	-.17***	-.17***	-.16***	.31***
4. Math ARS				1	.96***	.01***	.10***	.13***	.33***	-.19***	-.19***	-.16***	-.17***	-.07***	.29***
5. Combined ARS					1	.02	.12***	.15***	.35***	-.07***	-.21***	-.18***	-.18***	-.11***	.31***
6. 1 st Time Kindergarten (Y = 1; N = 0)						1	.01	-.01	.05***	-.01	-.06***	-.04***	-.08***	-.06***	.07***
Early behavioral protective factors:															
7. Early school-related emotional adaptation							1	.19***	.17***	-.16***	-.16***	-.10***	-.12***	-.07***	.07***
8. Parent-Reported prosocial behavior								1	.14***	-.18***	-.11	-.05***	-.04	-.05***	.14***
9. Teacher-Reported prosocial behavior									1	-.10***	-.31***	-.21***	-.57***	-.18***	.15***
Early behavioral risk factors:															
10. Parent-Reported internalizing behaviors										1	.10***	.27***	.01***	-.03**	-.01

Table 12 (Continued)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	13.	13.	14.	15.
11. Teacher-Reported internalizing behaviors											1	.03**	.25***	.03**	-.09***
12. Parent-Reported externalizing behaviors												1	.28***	.13***	-.17***
13. Teacher-Reported externalizing behaviors													1	.21***	-.11***
14. Gender														1	-.02**
15. SES in K															1

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

N/A is because Combined Academic Rating Scale (ARS) includes Reading ARS and Math ARS.

Research Question 2: Relations Among Key Variables

Research question 2 focused on how early academic and behavioral variables predicted outcomes in eighth grade when controlling for demographic variables. Several multiple and logistic regression analyses with hierarchical block entry were conducted to determine the relations between early behavioral variables (measured in kindergarten) and academic, disciplinary, and mental health outcomes in eighth grade. All of the analyses used longitudinal weights, which meant only individuals from the longitudinal sample were maintained within the sample. These tables have included unstandardized and standardized values. In order to be considered statistically significant, a beta coefficient's alpha level and critical value of .05 for *F* distribution needed to be reached. For logistic regression results, the unstandardized coefficients are reported (i.e., *B*), because Osborne (2015) reported that the interpretation of odds ratio can be more difficult when the value is less than one rather than greater than one.

With each equation, variables were entered in blocks. Different blocks and combination of blocks were entered to examine the variation accounted for by each model, as demonstrated in Appendix D for the reading outcome, which provides an overview of the multiple regression analyses. Each regression or logistic model had a block or blocks of variable entered. The models included different variables, as follows:

Model 1: Demographic variables

Model 2: Early academic variables

Model 3: Demographic and early academics variables

Model 4: Early academic variables and early resiliency behavior variables

Model 5: Early academic variables and early risk behavior

Model 6: Early resiliency behavior

Model 7: Demographics and early resiliency behavior

Model 8: Early resiliency behavior and early risk behavior

Model 9: Early risk behavior

Model 10: Demographic and early risk behavior

Model 11: All main effects

Tables 13 through 19 show all results. The main effects model or interaction model(s) were considered to be the final model, which was determined by whether or not the model was statistically significant. The other models were considered to be exploratory; results of those models are included within Appendix D through Appendix K.

Eighth grade reading achievement. To examine the predictive power of early kindergarten variables on eighth grade standardized reading IRT scores, multiple regression analyses were conducted. The various aforementioned models were conducted. Results of the final multiple regression are shown in Table 13 ($N = 5,365$) and the additional models are in Appendix D. The model featuring only all of the main effects accounted for 41% of the variance. For exploratory analyses, each block was entered separately and in combination with another (as found in Appendix D). The demographic and early academic model (model 3) accounted for 40% of the variability, which is the second highest amount of variance of the models. The early prosocial model, which is the model explained the least amount of variance of all of the models with 6%. . The early risk behavioral factors explained 8% of the variance. It is likely due to multicollinearity that less variance is accounted for than would be expected by each separate model.

No significant interactions were found between the variables of the models tested; therefore the model with only the main effects was the final model for eighth grade reading achievement. The results of this regression model showed that nine predictors explained 41% of

the variance, $R^2 = .41$, $F(18, 369) = 74.24$, $p < .0001$. These significant predictors of eighth grade reading achievement were gender (male = 1, female = 0; $\beta = -3.29$, $t(350) = -3.32$, $p = .001$), socioeconomic status composite ($\beta = 7.07$, $t(350) = 9.19$, $p < .0001$), racial/ethnic category (Black; yes = 1, no = 0; $\beta = -12.39$, $t(350) = -6.78$, $p < .0001$), first-time kindergarten status ($\beta = 6.48$, $t(350) = 3.11$, $p = .0020$), early reading assessment ($\beta = .20$, $t(350) = 3.52$, $p = .0005$), the Combined ARS ($\beta = 4.90$, $t(350) = 5.63$, $p < .0001$), early math assessment ($\beta = .73$, $t(350) = 9.67$, $p < .0001$), and early externalizing behavior (both parent- and teacher-reported; $\beta = -2.53$, $t(350) = -2.81$, $p = .0053$; ($\beta = -2.79$, $t(350) = -2.54$, $p = .0114$, respectively).

Early behavioral factors also were explored within the main effects model when early academic performance and demographic variables were controlled. Although no early resiliency behavioral variables were significant predictors of eighth grade math performance, there were risk factors (i.e., externalizing behavior as rated by parent and teacher separately) that were negatively related to long-term reading performance. A negative association was found between parent-reported externalizing behavior in kindergarten and IRT reading achievement in eighth grade ($\beta = -2.53$, $t(350) = -2.81$, $p = .0053$). Similarly, a negative association was found between teacher-reported externalizing behavior and IRT reading achievement in eighth grade ($\beta = -2.79$, $t(350) = -2.54$, $p = .0114$). In summary, the significant overall predictors of reading achievement in ordinal presentation were: 1) race/ethnicity (Black), 2) socioeconomic status composite, 3) first-time kindergarten status, 4) the Combined ARS, 5) gender, 6) teacher-reported externalizing behavior, 7) Parent-Reported externalizing behavior, 8) early math achievement, and 9) early reading achievement.

Table 13

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Reading Achievement Score of Final and Non-Significant Interactions (N = 5,365)

Model 11: All main effects (N = 5,365)		
Predictors	B	SE B
Intercept	133.31	7.79
Control		
Demographics		
Gender (1 = M; 0 = F)	-3.29**	1.00
SES composite	7.07***	.77
Asian ^a (Y= 1, N = 0)	-1.39	2.01
Black ^a (Y= 1, N = 0)	-12.39***	1.83
Hispanic ^a (Y= 1, N = 0)	-.12	1.32
Native American ^a (Y= 1, N = 0)	-2.98	3.46
Multit ^a (Y= 1, N = 0)	-.97	2.45
Early academic performance		
1 st Time kindergarten****	6.48**	2.09
Reading assessment	.20***	.06
Combo ARS	4.90***	.87
Math assessment	.73***	.07
Early resiliency behavior (bx)		
Early school-related emotional adaptation	2.02	2.28
Prosocial bx (parent-reported)	-.75	1.01
Prosocial bx (teacher-reported)	-.57	1.06
Early risk behavior (bx)		
Int bx (parent-reported)	.42	1.46
Int bx (teacher-reported)	-1.76	1.06
Ext bx (parent-reported)	-2.53**	.90
Ext bx (teacher-reported)	-2.79*	1.09
Interactions block		
Gender x ext bx (parent-reported)		
Gender x ext bx (teacher-reported)		
F Value	74.24***	
R ²	.41	
Δ R ²		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. **** Model 11 was the final model determined by significant variables, because of the tested interactions, neither was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NP1IMPUL = Not Significant in Model 12 and NGender*NT1EXTERN = Not Significant in Model 13) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Eighth grade math achievement. To examine the predictive power of the early kindergarten variables on eighth grade standardized math IRT scores multiple regression analyses were conducted. The various aforementioned models were used in the analyses. Results of the multiple regression for the final main effect model are shown in Table 14 ($N = 5,397$), while the exploratory models are in Appendix E. The all main effects model accounted overall for 43% of variance. The demographic and early academic variables combination model also accounted for 43%; therefore, these models accounted for the most variability. The early behavioral resiliency model (prosocial behavior and early school-related adjustment), as well as the early risk behavior model, accounted for 6% of variance when separately assessed. The protective and early risk behavior models both explained the least amount of variance of any of the models conducted for eighth grade achievement. Overall, the demographic factors accounted for 23% of the variance, while a separate model of early academics accounted for 36% of the variance. Early risk behavior explained 6% of the variance for math achievement. It is likely that due to multicollinearity that less variance is accounted for than would be expected by each separate model.

No significant interactions between variables were found; therefore, the all main effects model was the final model for eighth grade math achievement in Table 14. The results of this regression model suggested that six predictors explained 43% of the variance, $R^2 = .43$, $F(18, 368) = 73.88$, $p < .0001$. These significant predictors of eighth grade math achievement were gender ($\beta = 2.59$, $t(349) = 3.20$, $p = .0015$), socioeconomic status ($\beta = 5.03$, $t(349) = 8.90$, $p < .0001$), Black race ($\beta = -9.51$, $t(349) = -6.43$, $p < .0001$), first-time kindergarten status ($\beta = 8.52$, $t(349) = 3.36$, $p = .0009$), early math assessment ($\beta = .89$, $t(349) = 15.88$, $p < .0001$), and the

Combined Academic Rating Scale ($\beta = 4.94, t(349) = 8.50, p < .0001$), as well as early school-related emotional adaptation ($\beta = 4.94, t(349) = 8.50, p < .0001$).

Behavioral factors were also examined within the main effects model for eighth grade math achievement measured using the IRT score. One protective factor, namely early school-related emotional adaptation as reported by parents, was found to be a significant predictor of standardized IRT math achievement in eighth grade. There was a positive relationship between these two variables ($\beta = 3.60, t(349) = 2.18, p = .0296$). None of the behavioral risk factors examined in this study was found to be significant predictors of math achievement in eighth grade. In summary, the significant overall predictors of math achievement in eighth grade in ordinal presentation were: 1) racial/ethnicity category, 2) first-time kindergarten status, 3) socioeconomic status, 4) combined ARS, 5) early school-related emotional adjustment as reported by parents, and 6) gender.

Table 14

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Math Achievement Score (N = 5,397)

Model 11: All main effects (N = 5,397)		
Predictors	B	SE B
Intercept	92.25	6.68
Control		
Demographics		
Gender (1 = M; 0 = F)	2.59**	.81
SES composite	5.03***	.57
Asian ^a (Y= 1, N = 0)	1.35	2.37
Black ^a (Y= 1, N = 0)	-9.51***	1.48
Hispanic ^a (Y= 1, N = 0)	1.19	1.37
Native American ^a (Y= 1, N = 0)	-.23	2.20
Multi ^a (Y= 1, N = 0)	-2.43	2.48
Early academic performance		
1 st Time kindergarten****	8.52***	2.54
Reading assessment	-0.01	.05
Combination ARS	4.94***	.58
Math assessment	.89***	.06
Early resiliency Behavior (bx)		
Early school-related emotional adaptation	3.60*	1.65
Prosocial bx (parent-reported)	-.43	.98
Prosocial bx (teacher-reported)	-.72	.77
Early risk behavior (bx)		
Int bx (parent-reported)	-1.27	1.17
Int bx (teacher-reported)	-1.07	.74
Ext bx (parent-reported)	-.60	.59
Ext bx (teacher-reported)	-1.39	.87
F Value	73.88***	
R ²	.43	
ΔR^2	N/A	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. **** Model 11 was the final model determined by significant variables, because neither one of tested interactions was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NP1IMPUL = Not Significant in Model 12 and NGender*NT1EXTERN = Not Significant in Model 13) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Eighth grade GPA. To examine the predictive power of the early kindergarten variables on eighth grade GPA, logistic regression analyses were conducted. The various aforementioned models were used in the analyses. Results of the logistic regression are in Table 15, the while the exploratory models are in Appendix F. No total variance could be calculated due to a logistic analysis being conducted. (Please note this decision was based on Osborne's (2015) recommendations due to the controversy surrounding the validity of pseudo R-squared values, as maximum likelihood estimation does not appear compatible with this type of analysis).

No significant interactions were found between the variables of the models tested; therefore, the all main effects model was the final model for GPA as of eighth grade. The results of this logistic model suggested that three variables were significant predictors of GPA as of eighth grade ($F(18, 366) = 4,248.49, p < .001$). These significant predictors of eighth grade GPA were gender (male = 1, female = 0; $B = -1.05, t(366) = -2.47, p < .05$), socioeconomic status composite ($B = .60, t(369) = 2.47, p < .05$), and early math assessment ($B = .07, t(369) = 2.38, p < .05$).

Early behavioral factors were also explored within the main effects model when early academic performance and demographic variables were controlled. There were no significant behavioral risk or protective factors found. In summary, the significant overall predictors of eighth grade GPA in ordinal presentation were: 1) gender, 2) socioeconomic status composite, and 3) early math assessment.

Table 15

Summary of Logistic Analysis for Variables Predicting Academic Performance: GPA as of Eighth Grade ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,831-6,540$)

Model 11: Main Effects ($N = 5,444$)			
Predictor	B	SE B	Exp (β)
Intercept	1.44	2.52	N/A
Control			
Demographics			
Gender (1= male; 0 = female)	-1.05*	.43	.35
SES composite	.60*	.24	1.82
Race/ethnicity			
Asian ^a (Y= 1, N = 0)	1.95	1.00	7.00
Black ^a (Y= 1, N = 0)	.34	.48	1.40
Hispanic ^a ₁ (Y= 1, N = 0)	.21	.32	1.24
Native American ^a ₁ (Y= 1, N = 0)	.77	.78	2.15
Multi ^a (Y= 1, N = 0)	1.43	.75	4.17
Early academic performance			
First-time kindergarten (1= yes; 0 = no) *****	-.54	.52	.58
Reading assessment	-.01	.03	1.00
Combination ARS	-.15	.29	.86
Math assessment	.07*	.03	1.07
Early resiliency behavior (bx)			
Early school-related emotional adaptation	.51	.33	1.67
Prosocial bx (parent-reported)	.31	.29	1.37
Prosocial bx (teacher-reported)	-.07	.31	.93
Early risk behavior (bx)			
Int bx (parent-reported)	.43	.35	1.54
Int bx (teacher-reported)	.34	.40	1.41
Ext bx (parent-reported)	-.39	.20	.68
Ext bx (teacher-reported)	-.17	.27	.84
F Value	4,248.49***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Retention as of 2006-2007 school year. To examine the predictive power of the early kindergarten variables on retention as of the 2006-2007 school year (yes = 1, no = 0), logistic regression analyses were conducted. The various aforementioned models were used in these analyses. Results of the multiple regression for the final interaction model are shown in Table 20 in the Moderator section ($N = 5,603$), while the exploratory models are in Appendix G. Since a significant interaction was found the all main effects is not discussed, and the interaction model can be found within the Moderator Section under Research Question 3.

Suspension. To examine the predictive power of early kindergarten variables on the presence or absence of suspension, logistic regression analyses were conducted. Specifically, the various aforementioned models were used in the analyses. Results of the all main effect logistic regression model are shown in Table 16 ($N = 5,519$) and the additional models are in Appendix H. No total variance could be calculated due to a logistic analysis being conducted.

No significant interactions were found between the variables of the models tested; therefore, the final model included only all of the main effects examined for suspension as of eighth grade. One of the insignificant interactions models tested included gender x Black. The results of this logistic model suggested that eight variables were significant predictors of suspensions as of eighth grade ($F(18, 369) = 23,656.3, p < .0001$). These significant predictors of suspension as of eighth grade were gender (male = 1, female = 0; $B = .98, t(350) = 7.02, p < .0001$), socioeconomic status composite ($B = -.36, t(350) = -3.65, p < .001$), racial/ethnic categories (see below), the Combined ARS ($B = .24, t(350) = 2.32, p = .021$), parent -reported prosocial behavior (see below), and parent- and teacher-reported early externalizing behavior (see below). Black students (yes = 1, no = 0) were positively associated with the presence of

suspension ($B = .92, t(350) = 5.78, p < .0001$), while Asian students (yes = 1, no = 0) were negatively associated with the presence of suspension ($B = -.85, t(350) = -2.32, p < .0001$).

Early behavioral factors were also explored within the main effects model when early academic performance and demographic variables were controlled. There was one significant protective factor and several early behavioral risk factors that predicted presence of suspension. Parent-reported prosocial behavior was positively associated with the presence of suspension ($B = .32, t(350) = 2.70, p = .007$). There were no significant relations between internalizing behavior in kindergarten and suspension. Lastly, there was a positive relation between parent- and teacher-reported externalizing behavior in kindergarten and the presence of a suspension ($B = .37, t(350) = 3.28, p = .0012$; $B = .50, t(350) = 3.89, p < .0001$) respectively. In summary, the significant overall predictors of presence of suspension in ordinal presentation were: 1) gender, 2 - 3) racial/ethnic categories: Black (more likely than Caucasian student) and Asian (less likely than Caucasian students), 4) teacher-reported externalizing behavior, 5) parent-reported externalizing behavior, 6) socioeconomic status composite, 7) the Combined ARS, and 8) parent-reported prosocial behavior.

Table 16

Summary of Logistic Analysis for Variables Predicting Academic Performance: Suspension as of Eighth Grade (yes = 1 or no = 0; N= 5,519-6,097)

Model 11: Main effects (N = 5,519)			
Predictors	B	SE B	Exp (β)
Intercept	- 4.03	.96	N/A
Predictor			
Control			
Demographics			
Gender (1= male; 0 = female)	.98***	.14	2.67
SES composite	-.36***	.10	.70
Hispanic ^a (Y= 1, N = 0)	.14	.16	1.15
Black ^a (Y= 1, N = 0)	.92***	.16	2.52
Native American ^a (Y= 1, N = 0)	.14	.42	1.15
Asian ^a (Y= 1, N = 0)	-.85*	.37	.43
Multi ^a (Y= 1, N = 0)	.25	.37	1.29
Early academic performance			
First-time kindergarten (1= yes; 0 = no) *****	-.36	.25	.70
Reading assessment	-.01	.01	.99
Combination ARS	.24*	.10	1.27
Math k assessment	-.02	.01	.98
Early resiliency behavior (bx)			
Early school-related emotional adaptation	-.31	.21	.74
Prosocial bx (parent-reported)	.32**	.12	1.38
Prosocial bx (teacher-reported)	-.02	.14	.98
Early risk behavior (bx)			
Int bx (parent-reported)	.18	.20	1.20
Int bx (teacher-reported)	-.09	.13	.92
Ext bx (parent-reported)	.37**	.11	1.44
Ext bx (teacher-reported)	.50***	.13	1.65
Parent-reported externalizing bx x black			
F value	23,656.3***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. **** Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Eighth grade educational/mental health diagnoses. To examine the predictive power of early kindergarten variables on presence or absence of educational/mental health diagnoses, logistic regression analyses were conducted. The various aforementioned models were used in the analyses. Results of the all main effects logistic regression model are shown in Table 17 ($N = 5,529$) and the additional models are in Appendix I. No total variance could be calculated due to the type of analysis being conducted.

No significant interactions were found between the variables of the models tested; therefore, the all main effects model was the final model for an eighth grade educational/mental health diagnosis. The results of this logistic regression model suggested that 11 variables were significant predictors of eighth grade educational/mental health diagnosis ($F(18, 369) = 23,387.7, p < .0001$). These significant predictors were gender (male = 1, female = 0; $B = .31, t(350) = 2.49, p = .0132$), race (see below), first-time kindergarten status (1 = yes, 0 = no; $B = -1.04, t(350) = -3.56, p = .0004$), math assessment ($B = -0.05, t(350) = -3.97, p < .0001$), and the Combined ARS ($B = -.34, t(350) = -3.80, p = .0002$), and several behavioral risk factors (see below) were found to be significant predictors of the presence of an educational/mental health diagnosis as reported by parents in eighth grade. Students who were Hispanic ($B = -.52, t(350) = -2.54, p < .01$), Black ($B = -.73, t(350) = -3.00, p = .0029$), Native American ($B = -.75, t(350) = -2.70, p = .0073$), and Asian ($B = -1.20, t(350) = -2.57, p = .0105$) were reported as less likely to have an educational/mental health diagnosis than Caucasian students.

Early behavioral factors were also explored within the main effects model when early academic and demographic variables were controlled. There were no behavioral protective factors found, but there were three significant behavioral risk factors within this final model. Parent-reported internalizing behavior in kindergarten was positively associated with

educational/mental health diagnosis in eighth grade ($B = .42, t(350) = 2.89, p = .0040$). Parent- and teacher-reported externalizing behaviors (separately reported) were positively associated with a parent-reported educational/mental health diagnosis in eighth grade ($B = .38, t(350) = 3.69, p = .0003$; $B = .60, t(350) = 5.21, p < .0001$), respectively. In summary, the significant overall predictors of presence of eighth grade educational/mental health diagnosis in ordinal presentation were: 1) racial/ethnic category: Asian, 2) first-time kindergarten status, 3-4) racial/ethnic categories: Black and Native American, 5) parent-reported internalizing behavior, 6) teacher-reported externalizing behavior, 7) racial/ethnic category: Hispanic, 8) parent-reported externalizing behavior, 9) the Combined ARS, 10) gender, and 11) math assessment.

Table 17

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; $N = 5,529-6,105$)

Model 11: Final model with main effects ($N = 5,529$)			
Predictors	B	SE B	Exp (β)
Intercept	.58	1.00	N/A
Predictor			
Control			
Demographics			
Gender (1= male; 0 = female)	.31*	.13	1.37
SES composite	.16	.09	1.18
Hispanic ^a (Y= 1, N = 0)	-.52*	.21	.59
Black ^a (Y= 1, N = 0)	-.73**	.24	.48
Native American ^a (Y= 1, N = 0)	-.75**	.28	.47
Asian ^a (Y= 1, N = 0)	-1.20*	.47	.30
Multi ^a (Y= 1, N = 0)	.02	.29	1.02

Table 17 (Continued)

Model 11: Final model with main effects (N = 5,529)			
Predictors	B	SE B	Exp (β)
Early academic performance			
First-time kindergarten (1= yes; 0 = no) *****	-1.04***	.29	.35
Reading assessment	-.01	.01	.99
Combination ARS	-.34***	.09	.71
Math assessment	-.05***	.01	.96
Early resiliency behavior (bx)			
Early school-related emotional adaptation	-.29	.19	.75
Prosocial bx (parent-reported)	-.11	.11	.90
Prosocial bx (teacher-reported)	.05	.13	1.05
Early risk behavior (bx)			
Int bx (parent-reported)	.42**	.14	1.52
Int bx (teacher-reported)	.06	.14	1.07
Ext bx (parent-reported)	.38***	.10	1.46
Ext bx (teacher-reported)	.60***	.12	1.83
F value	23,387.7***		

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Internalizing problems in eighth grade. To examine the predictive power of early kindergarten variables on eighth grade internalizing problems, multiple regression analyses were conducted. Various types of the aforementioned models were used in the analyses. Results of the final multiple regression are shown in Table 18 ($N = 5,525$) and the additional models are in Appendix J. The all main effects models accounted for 12% of the variance. The early academic and early risk behavior model (model 5) accounted for 10% of the variability, which is the second highest amount of variance of the models. The demographics model (model 1) explained 1% of the variance, which is the model that explained the least amount of variance of all of the models. The early behavioral risk factors model (model 9) explained 7% of the parent-reported internalizing symptoms in eighth grade. Please refer to Appendix J for further information. It is

likely due to multicollinearity that less variance is accounted by variables or a block within the overall model than would be expected by examining each separate model.

No significant interactions were found between the variables of the models tested; therefore the all main effects model was the final model for eighth grade internalizing symptoms. The results of this regression model suggested that 10 predictors explained 12% of the variance, $R^2 = .12$, $F(18, 369) = 31.69$, $p < .0001$. These significant predictors of eighth grade internalizing symptoms were racial/ethnic categories (see below), first-time kindergarten status ($\beta = -.16$, $t(350) = -3.77$, $p = .0002$), early math assessment ($\beta = -.003$, $t(350) = -2.54$, $p = .0116$), early school-related emotional adjustment ($\beta = -.06$, $t(350) = -3.30$, $p = .0011$), early prosocial behavior (parent-reported; $\beta = -.03$, $t(350) = -2.52$, $p = .0122$), early internalizing behavior (parent-reported; $\beta = .12$, $t(350) = 6.40$, $p < .0001$), and early externalizing behavior (parent-reported; adolescence ($\beta = .04$, $t(350) = 6.40$, $p < .0001$). Certain racial/ethnic categories (yes = 1, no = 0 per each category) for Asian ($\beta = -.07$, $t(350) = -2.13$, $p = .0336$), Black ($\beta = -.08$, $t(350) = -4.02$, $p < .0001$), Native American ($\beta = -.09$, $t(350) = -4.70$, $p < .0001$), and Multi-Racial ($\beta = -.10$, $t(350) = -3.04$, $p = .0025$) were negatively related to internalizing symptoms in comparison to Caucasian students.

Early behavioral factors were also explored within the main effects model when early academic performance and demographic variables were controlled. Two protective factors, early school-related emotional adjustment ($\beta = -.06$, $t(350) = -3.30$, $p = .0011$) and prosocial behavior (parent-reported; $\beta = -.03$, $t(350) = -2.52$, $p = .0122$), were both negatively related to eighth grade internalizing symptoms. There were two risk factors that were significantly related to internalizing symptoms in adolescence. Parent-reported early internalizing behavior was positively associated with later internalizing symptoms ($\beta = .12$, $t(350) = 6.40$, $p < .0001$). Also

parent-reported early externalizing behavior was positively associated with internalizing symptoms in early adolescence ($\beta = .04, t(350) = 6.40, p < .0001$). In summary, the significant overall predictors of internalizing problems in ordinal personation were: 1) first-time kindergarten status, 2-5) race/ethnicity (Multi-Racial, Native American, Asian, Black), 6) early school related-adjustment, 7) parent-reported early externalizing behavior, 8) race/ethnicity (Hispanic), 9) parent-reported early prosocial behavior, and 10) parent-reported early internalizing behavior.

Table 18

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Internalizing Problems in Eighth Grade (N = 5,525)

Model 11: All main effects (N = 5,525)		
Predictors	B	B
Intercept	1.59	.11
Control		
Demographics		
Gender (1 = M; 0 = F)	-.02	.01
SES composite	-.01	.01
Asian ^a (Y= 1, N = 0)	-.07*	.03
Black ^a (Y= 1, N = 0)	-.08***	.02
Hispanic ^a (Y= 1, N = 0)	-.03	.02
Native American ^a (Y= 1, N = 0)	-.09***	.02
Multi ^a (Y= 1, N = 0)	-.10**	.03
Early academic performance		
1 st time kindergarten****	-.16***	.04
Reading assessment	-.01	.01
Combo ARS	-.01	.01
Math assessment	-.01*	.01
Early resiliency behavior (bx)		
Early school-related emotional adaptation	-.06**	.02
Prosocial bx (parent-reported)	-.03*	.01
Prosocial bx (teacher-reported)	-.02	.01
Early risk behavior (bx)		
Int bx (parent-reported)	.12***	.02
Int bx (teacher-reported)	.02	.02
Ext bx (parent-reported)	.04**	.01

Table 18 (Continued)

Model 11: All main effects (N = 5,525)		
Predictors	B	B
Ext bx (teacher-reported)	.02	.02
F value	31.69***	
R ²	.12	
Δ R ²	.03	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. **** Model 11 was the final model determined by significant variables, because of the tested interactions, neither was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NP1IMPUL = Not Significant and NGender*NT1EXTERN = Not Significant) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Externalizing problems in eighth grade. To examine the predictive power of early kindergarten variables on eighth grade externalizing problems, multiple regression analyses were conducted. The various aforementioned models were used in the analyses. Results of the final multiple regression are shown in Table 19 (N = 5,525) and the additional models are in Appendix K. The all main effects models accounted for 26% of the variance. The early academic and early risk behavior model (model 5), as well as the demographics and early risk behavior model (model 10) accounted for 23% of the variance, which tied for the second highest amount of variance of the models. The early academics model (model 2), as well as the early resiliency behavior model (model 6) each explained 7% of the variance, which are the models that explained the least amount of variance of all of the models. The early risk behavior model (model 9) explained 20% of the variance of externalizing symptoms in eighth grade. Please refer to Appendix K for further information. It is likely due to multicollinearity that less variance is accounted for than would be expected by each separate model.

No significant interactions were found between the variables of the models tested; therefore the all main effects model for the final model for eighth grade parent-reported

externalizing symptoms. The results of this regression model suggested that ten predictors explained 26% of the variance, $R^2 = .26$, $F(18, 369) = 35.06$, $p < .0001$. These significant predictors of eighth grade externalizing symptoms were gender ($\beta = .06$, $t(350) = 4.01$, $p < .001$), socioeconomic status composite ($\beta = -.03$, $t(350) = -2.86$, $p = .0045$), racial/ethnic categories (see below), early math assessment ($\beta = -.004$, $t(350) = -3.28$, $p = .0011$), early school-related emotional adjustment ($\beta = -.06$, $t(350) = -2.51$, $p = .0125$), internalizing behavior (see below), and early externalizing behavior (both parent- and teacher-reported; see below). Certain racial/ethnic categories (yes = 1, no = 0 per each category) for Hispanic ($\beta = -.05$, $t(350) = -2.66$, $p = .0082$), Asian ($\beta = -.11$, $t(350) = -4.46$, $p < .0001$), and Native American ($\beta = -.14$, $t(350) = -6.34$, $p < .0001$) were negatively related to externalizing symptoms.

Early behavioral factors were also explored within the main effects model when early academic performance and demographic variables were controlled. One protective factor, early school-related emotional adjustment ($\beta = -.06$, $t(350) = -2.51$, $p = .0125$) was negatively related to eighth grade externalizing symptoms. There were two risk factors that were significantly related to externalizing symptoms in adolescence. Parent-reported early internalizing behavior was positively associated with later externalizing symptoms ($\beta = .05$, $t(350) = 2.64$, $p = .0087$). Also parent-reported early externalizing behavior was positively associated with internalizing symptoms in early adolescence ($\beta = .14$, $t(350) = 9.94$, $p < .0001$). Moreover, teacher-reported externalizing behavior was also positively related to externalizing symptoms in eighth grade ($\beta = .11$, $t(350) = 6.22$, $p < .0001$). In summary, the significant overall predictors of reading achievement in ordinal presentation were: 1) parent-reported early externalizing behavior, 2) race/ethnicity (Native American), 3) teacher-reported early externalizing behavior, 4) race/ethnicity (Asian), 5) gender, 6) race/ethnicity (Hispanic), 7) early school-related emotional

adjustment, 8) internalizing behavior (parent-reported), 9) early math assessment, and 10) socioeconomic status composite.

Table 19

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Externalizing Problems in Eighth Grade (N = 5,525)

Model 11: All main effects (N = 5,525)		
Predictors	B	B
Intercept	1.33	.13
Control		
Demographics		
Gender (1 = M; 0 = F)	.06***	.02
SES composite	-.03**	.01
Asian ^a (Y= 1, N = 0)	-.11***	.03
Black ^a (Y= 1, N = 0)	-.04	.02
Hispanic ^a (Y= 1, N = 0)	-.05**	.02
Native American ^a (Y= 1, N = 0)	-.14***	.02
Multi ^a (Y= 1, N = 0)	-.04	.04
Early academic performance		
1 st time kindergarten****	-.05	.05
Reading assessment	-.01	.01
Combo ARS	-.02	.01
Math assessment	-.01*	.01
Early resiliency behavior (bx)		
Early school-related emotional adaptation	-.06*	.02
Prosocial bx (parent-reported)	-.02	.01
Prosocial bx (teacher-reported)	-.01	.01
Early risk behavior (bx)		
Int bx (parent-reported)	.05**	.02
Int bx (teacher-reported)	-.03	.02
Ext bx (parent-reported)	.14***	.01
Ext bx (teacher-reported)	.11***	.02
F value	35.06***	
R ²	.26	
Δ R ²	.05	

Note. **p* < .05. ***p* < .01. *** <.001. **** Model 11 was the final model determined by significant variables, because the tested interaction was not significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note the interaction (e.g., NGender x SES = Not Significant) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Research Question 3: Moderators

Research question 3 expanded on research question 2 through examining eighth grade academic or behavioral outcomes moderated by early demographic variables. Kindergarten was chosen as the moderating variable, because the researcher was interested in what variable early on may have served as a moderator between a risk factor and outcome. Again several multiple and logistic regression analyses with hierarchical block entry were conducted to determine the relations between early behavioral variables (measured in kindergarten) and academic, disciplinary, and mental health outcomes in eighth grade. Particular longitudinal weights were also used in order to retain the longitudinal student population. Table 20 includes unstandardized and standardized values. In order to be considered statistically significant, a beta coefficient's alpha level and critical value of .05 for *F* distribution needed to be reached.

With each equation, variables were again entered in blocks. Different blocks and combination of blocks were entered to examine the variation accounted for by each model, as demonstrated in Appendix D for the reading outcome, which provides an overview of the multiple regression analyses. Each regression or logistic model had a block or blocks of variable entered. This type of logistic or regression analyses included interaction terms, which were either exploratory or based on hypotheses from previous research. The statistically significant moderators were included within Table 20, whereas the nonsignificant moderators for all results are displayed in Appendix D through Appendix K.

Any early kindergarten variable with significant moderators in relation to eighth grade outcomes is reported below. Analyses were conducted using Aiken and West's (1991) recommendations to initially center main effects before examining potential interactions in order to avoid multicollinearity and facilitate understanding of beta coefficients. Moreover, these

models examined whether a demographic variable served as a moderator between predictors and outcomes. These tables include unstandardized and standardized values. Please note no R-Squared values were calculated if it were a logistic regression analysis, which is again based on the controversy surrounding pseudo R-squared (Osborne, 2015).

There were a few interactions per an outcome that were chosen based on research or for exploratory purposes. After all of the main effects were entered, one interaction was tested at a time. In the current study, after all of the main effects were entered, the researcher entered a demographic variable (e.g., gender) between another risk or resiliency factor (such as parent-reported externalizing behavior). This entry was in relation to an outcome (e.g., suspension). In order to be considered statistically significant, interactions needed to reach the critical value of .05 for the F ratio to be met. As discussed above, only two interactions of the models tested were found to be statistically significant (between parent-reported or teacher-reported early externalizing behavior and gender in relation to retention with the latter two interactions in Table 20). Please note that each interaction was considered separately for statistical significance and not considered together simultaneously within a model. Figures 3-5 of this study briefly review and visually represent these relations.

Gender and externalizing behaviors as a moderator for retention. Based on the examination of the predictive power of early kindergarten variables, significant interactions were found within the logistic regression analyses. Gender (male = 1; female = 0) was positively associated with retention, which meant males were more likely to be retained. Again variance could not be calculated due to the type of analysis was logistic regression.

Retention had two interactions that were found to be statistically significant. Based on the first interaction, between gender and parent-reported externalizing behavior was found to be

statistically significant ($B = -.43, t(350) = 2.90, p = .004$). The results of this logistic model suggested that six variables were significant predictors of retention as of eighth grade ($F(19, 370) = 26,480.6, p < .0001$). These six significant predictors including 1) the interaction (see above), along with 2) gender ($B = 1.40, t(350) = 2.90$), 3) racial/ethnic category (Hispanic; $B = -1.04, t(350) = -3.96, p < .0001$), 4) early math achievement ($B = -.10, t(350) = -4.37, p < .0001$) the Combined ARS ($B = -.58, t(350) = -3.11, p = .002$) and 6) emotional adjustment ($B = -.46, t(350) = -2.13, p = 0.0338$). However, the main effects should be interpreted with some caution in the presence of an interaction.

Another separate statistically significant interaction found for retention was between gender and teacher-reported externalizing behavior ($B = -.48, t(350) = -2.31, p < .05$). The same predictors were also significant for the second interaction of gender multiplied by teacher-reported externalizing behavior, with major difference being a different interaction and some slight variations in the maximum likelihood estimates ($F(19, 370) = 26,524.4, p < .0001$). Consequently, there were six significant predictors including 1) the interaction (see above), along with 2) gender ($B = 1.33, t(350) = 3.51, p = .0005$), 3) racial/ethnic category (Hispanic; $B = -1.04, t(350) = -3.96, p < .0001$), 4) early math achievement ($B = -.10, t(350) = -4.37, p < .0001$) the Combined ARS ($B = -.57, t(350) = -3.11, p = .0015$, and 6) school-related emotional adjustment ($B = -.46, t(350) = -2.14, p = 0.033$).

Figures 3 and 4 show these interactions models. These figures highlight that males were more likely to be retained than females as of eighth grade. However, increased intensity of parent-and teacher-reported female externalizing behavior in kindergarten was associated with an increased risk for retention in eighth grade than males, regardless of their parent- or teacher-reported externalizing behavior in kindergarten. Overall, gender was found to be a moderator

across raters (i.e., parent or teacher) for early externalizing behavior and the presence of a retention. In summary, the significant overall predictors of presence of retention in ordinal presentation were: 1) gender, 2) racial/ethnic category: Hispanic, 3) the Combined ARS, 4) emotional adjustment, 5) interactions (gender x parent-reported early externalizing behavior, and teacher-reported early externalizing behavior) and 6) math early achievement.

Table 20

Interaction Models Summary of Logistic Analysis for Variables Predicting Retention as of 2006-2007 School Year (yes = 1; no= 0; N = 5,603)

Predictors	Interaction model 1: Parent-reported externalizing bx x gender (N = 5,603)			Interaction model 2: Teacher-reported externalizing behavior x gender (N =5,603)		
	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	2.20	1.35	N/A	2.20	1.32	N/A
1 st block: Control						
Demographics						
Gender (1= male; 0 = female)	1.40**	.48	N/A	1.33***	.38	N/A
SES composite	-.25	.15	.78	-.25	.15	.78
Asian ^a (Y= 1, N = 0)	-.51	.49	.60	-.54	.48	.59
Hispanic ^a (Y= 1, N = 0)	-1.04***	.26	.35	-1.04***	.26	.35
Black ^a (Y= 1, N = 0)	.06	.16	1.06	.05	.16	1.05
Native American ^a (Y= 1, N = 0)	-.34	.26	.71	-.35	.25	.71
Multi ^a (Y= 1, N = 0)	-.59	.47	.55	-0.57	.49	.57
Early academic						
First-time kindergarten (1= yes; 0 = no)	.67	.66	1.96	.63	.65	1.89

Reading assessment	-.03	.02	.97	-.03	.02	.97
Combo ARS	-.58**	.19	.56	-.57**	.18	.56
Math assessment	-.10***	.02	.91	-.10***	.02	.91
2 nd block: Early resiliency behavior (bx)						
Early school-related emotional adaptation	-.46*	.22	.63	-.46*	.22	.63
Prosocial bx (parent-reported)	.11	.19	1.11	.11	.19	1.12
Prosocial bx (teacher-reported)	-.08	.16	.92	-.07	.16	.93
3rd block: Early risk behavior (bx)						
Int bx (parent-reported)	-.02	.20	1.00	-.01	.19	1.00
Int bx (teacher-reported)	.19	.18	1.21	.20	.17	1.22
Ext bx (parent-reported)	.41*	.20	N/A	.11	.13	1.12
Ext bx (teacher-reported)	.09	.17	1.09	.43*	.21	N/A
Block 4: Interactions						
Ext bx (parent-reported) x gender	-.43*	.21	N/A			
Ext bx (teacher-reported) x gender				-.47*	.20	N/A
F value	26,480.6***			25,524.4***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Figure 3. *Parent-reported externalizing behavior in kindergarten by gender interaction in relation to retention as of 2006-2007 school year*

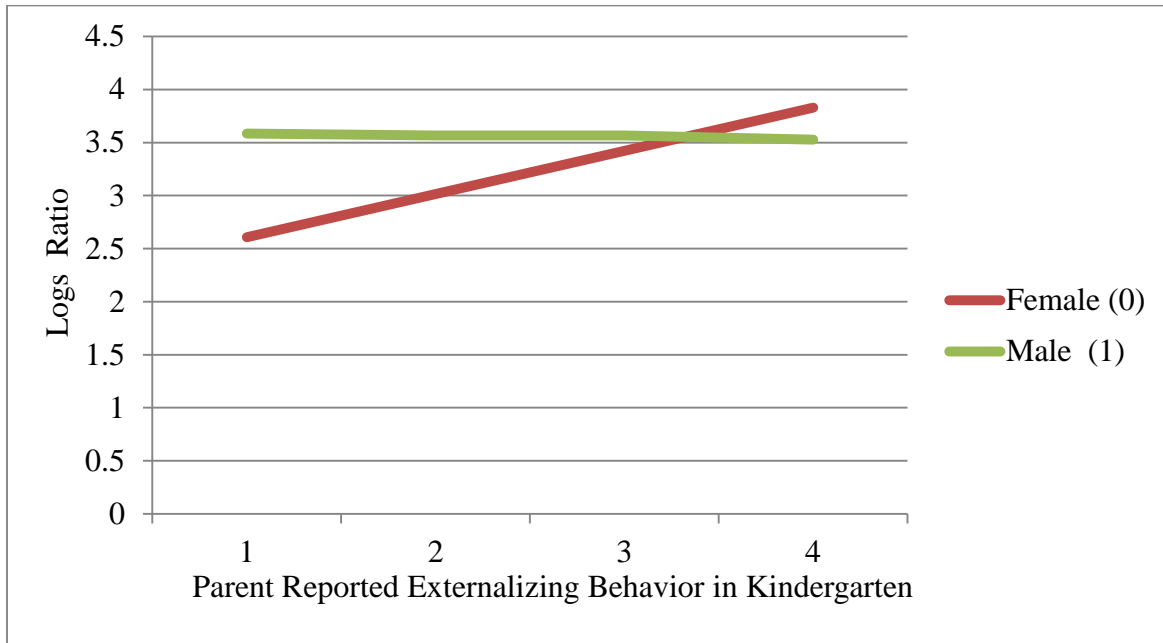
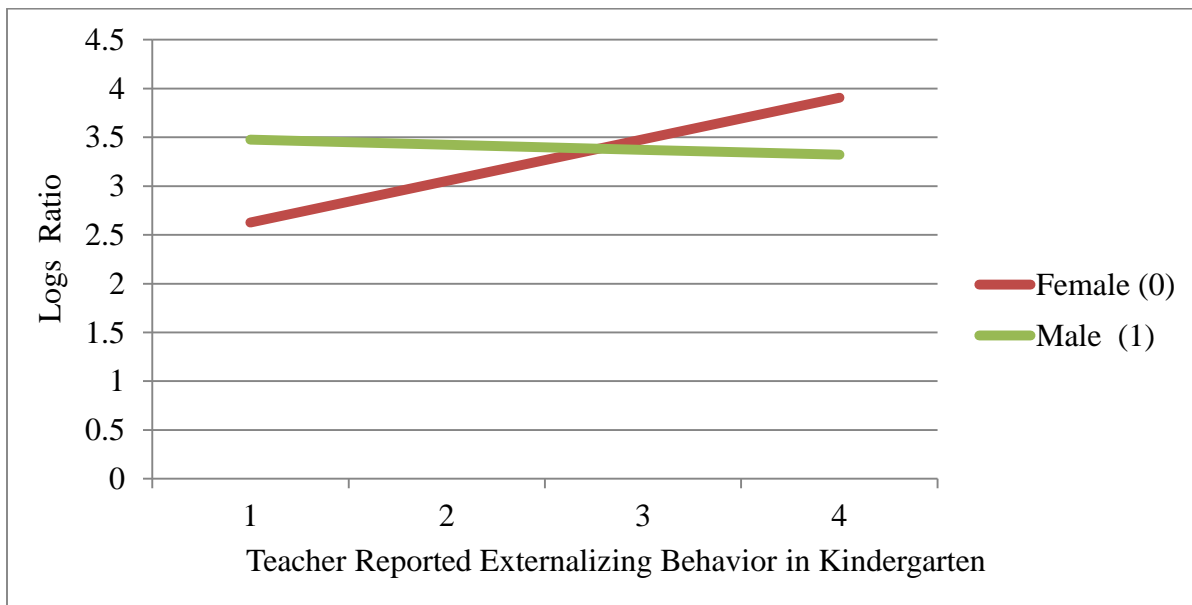


Figure 4. *Teacher-reported externalizing behavior in kindergarten by gender interaction in relation to retention as of 2006-2007 school year*



Residuals. Residual values were calculated for each multiple regression equation main effects model to evaluate the discrepancy between the dependent variable and the predicted variable for each multiple regression equation. Calculating these values helps validate the regression models. All of the eighth grade outcome regression models for standardized reading test, standardized math test, internalizing symptoms, and externalizing symptoms were all within Walker and Maddan’s (2008) recommendation guidelines for skewness. Although the kurtosis values for internalizing and externalizing behaviors were not within the ideal guidelines, it is important to note that previous ECLS-K studies’ researchers do not report skewness or kurtosis values, nor have they reported transforming the data. Table 21 shows all residual values.

Table 21

Residual Table for Weighted Multiple Regression Equations

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	Range	Skewness	Kurtosis
Academic Outcomes						
Reading IRT	6,541	1.07	20.91	168.22	-0.69	0.55
Math IRT	6,581	.35	16.10	259.13	-0.55	0.55
Behavioral Outcomes						
Int'l Bx	6,156	.01	6.44	2.41	2.47	7.46
Ext'l Bx	6,156	.01	6.76	2.49	1.83	7.46

Please find in Table 22 a summary of the R-squared in multiple regression equations, which is the amount of variance accounted by each model. On eighth grade reading and math standardized test scores, demographics and early academics accounted for most of the variance from early predictors. Early risk behavior appeared to account for most of the variance for externalizing behavior as of spring 2007, whereas there less overall variance accounted for in terms of internalizing behavior. However, early risk academics and early risk behavior appeared

to account for the most variance for internalizing symptoms as of spring 2006-2007. (Again please note there is no summary table for logistic regression equations, and the rationale for this decision was based on Osborne’s recommendations (2015). There is controversy surrounding the validity of pseudo R-squared values, as maximum likelihood estimation does not appear compatible with this type of analysis).

Table 22

Summary Table of R-Squared Values in Multiple Regression Equations

Eighth Grade Outcome (Spring 2006-2007)				
Kindergarten Predictor	Reading	Math	Parent-Reported Internalizing Symptoms	Parent-Reported Externalizing Symptoms
Model 1: Demographics	.27	.23	.01	.08
Model 2: Early Academics	.31	.36	.04	.07
Model 3: Demographics and Early Academics	.40	.43	.05	.12
Model 4: Early Academics and Early Resiliency Behavior	.32	.36	.07	.11
Model 5: Early Academics and Early Risk Behavior	.33	.37	.10	.23
Model 6: Early Resiliency Behavior	.06	.06	.04	.07
Model 7: Demographics and Early Resiliency Behavior	.29	.26	.05	.12
Model 8: Early Resiliency and Early Risk Behavior	.10	.09	.09	.21
Model 9: Early Risk Behavior	.08	.06	.07	.20
Model 10: Demographics and Early Risk Behavior	.30	.26	.08	.23
Model 11: All Main Effects	.41	.43	.12	.26
Model 12: Interaction Models	<i>N.S.</i>	<i>N.S.</i>	<i>N.S.</i>	<i>N.S.</i>

Note. Not Significant = *N.S.* To determine the percentage of variance multiply each decimal by 100.

Summary of Results

This chapter presented the interrelations among the key predictors, as well as between kindergarten predictors and educational outcomes, and between kindergarten predictors and behavioral outcomes in eighth grade. Based on the high correlations between the teacher’s

perceptions of students' academic skills in math and reading, these two measures were collapsed into the Combined Academic Rating Scales (ARS). Gender (male = 1, female = 0) was negatively associated with standardized IRT reading achievement and GPA in eighth grade, while gender was positively associated with standardized IRT math achievement in eighth grade. General directionality of the regression and logistic analyses can be found in Table 23. Gender was positively associated with retention, parent-reported educational or mental health diagnosis as of eighth grade, and parent-reported externalizing behaviors in eighth grade. Socioeconomic status was positively associated with standardized IRT math assessments in eighth grade and GPA in eighth grade. Furthermore, socioeconomic status was negatively associated with overall suspensions over a child's school career from kindergarten through eighth grade, as well as with externalizing behavior in eighth grade.

Racial/ethnic patterns were also found within this study. Hispanic students were less likely to be retained than Caucasian peers. Moreover, Hispanic students are less likely to have an educational or mental health diagnosis and have significantly lower levels of parent-reported externalizing behaviors as of eighth grade than Caucasian students. In this study, Black students had lower levels of math and reading scores in eighth grade and were more likely to have had a suspension than Caucasian students. Black students' parents reported their children as less likely to have an educational or mental diagnosis, as well as have lower levels of internalizing behaviors, than Caucasian students. Native American students were less likely to have an educational or mental health diagnosis than Caucasian students. Native American parents reported their children as less likely to have internalizing and externalizing behaviors than Caucasian students. Moreover, Asian students were less likely to have ever been suspended overall (kindergarten through spring of eighth grade) than Caucasian students, as well as less

likely to have an educational or mental health diagnosis, internalizing behaviors, and externalizing behaviors than Caucasian students. Multi-racial students were negatively associated with retention and internalizing behaviors.

Patterns were also found for background academic variables. Students who had been first-time kindergarten students (yes = 1, no = 0) were positively associated with reading and math achievement in eighth grade on standardized tests, while first-time kindergarten students were negatively associated with an educational or mental health diagnosis. Students who were first-time kindergarten students also were in a statistical sense, negatively associated with suspension as of eighth grade and internalizing problems in eighth grade, which meant that these students had a lower likelihood of these types of concerns. Reading assessment in kindergarten was found to be a significant predictor of reading achievement on a standardized test in eighth grade. Early reading achievement was negatively related to suspensions as of eighth grade. Performance on standardized math assessment in kindergarten was found to be the most consistent predictor of the academic variables in relation to long-term academic, and behavioral outcomes. Lastly, the Combined Academic Rating Scale was positively associated with reading and math performance on standardized tests. The Combined ARS was negatively related to an educational or mental health.

In terms of main effects, protective and risk behavioral factors should also be reviewed. Early school-related emotional adjustment was positively associated with eighth grade math performance on a standardized test. Moreover, school-related emotional adjustment was statistically negatively related to retention, suspension, internalizing, and externalizing behaviors. Parent-reported early prosocial behavior was positively associated with suspension. However, parent-reported early prosocial behavior was negatively associated with long-term

internalizing behaviors. Please note that teachers' ratings on prosocial behavior in kindergarten were not significantly related to any of the long-term outcomes (i.e., suspension and internalizing behavior).

Finally, there were more relations found between early behavioral risk factors and outcomes than between resiliency factors and outcomes. Parent-reported internalizing behavior in kindergarten was positively associated with presence of a suspension, an educational or mental health diagnosis, internalizing behaviors, as well as with externalizing behaviors. However, teacher-reported internalizing behavior was not significantly related to suspension. Parent-and teacher-reported early externalizing behavior was negatively associated with eighth grade reading achievement on a standardized test, while parent-and teacher-reported early externalizing behavior was positively associated with suspension. Children who were rated as having externalizing problems by both raters also positively associated with an educational or mental health diagnosis and with parent-reported externalizing behavior reported in early adolescence. Only parent-reported early externalizing behavior was positively associated with retention and internalizing behavior in eighth grade.

Table 23

Summary of Directionality and Strength of the Regression Equations

Outcome	Academic outcomes				Behavioral outcomes			
	Reading	Math	GPA	Retention _{1&2}	Suspension Y/N	Educational or M.H. diagnosis	Int'l bx	Ext'l bx
Demographics								
Gender (m=1)	- **	+ **	- *	+ ** ₂ or + *** ₃	+ ***	+ *	N.S.	+ ***
SES	+ ***	+ ***	+ *	N.S.	- ***	N.S.	N.S.	- **
Asian ^a	N.S.	N.S.	N.S.	N.S.	- *	- *	- *	- ***
Black ^a	- ***	- ***	N.S.	N.S.	+ ***	- **	- ***	N.S.
Hispanic ^a	N.S.	N.S.	N.S.	- ***	N.S.	- **	N.S.	- **
Native Am ^a	N.S.	N.S.	N.S.	N.S.	N.S.	- **	- ***	- ***
Multiracial ₁	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	- **	N.S.
Early academic variables								
1st time k	+ **	+ ***	N.S.	N.S.	N.S.	- ***	- ***	N.S.
Reading assessment	+ ***	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Academic rating combo	+ ***	+ ***	N.S.	- **	+ *	- ***	N.S.	N.S.
Math k assessment	+ ***	+ ***	+ *	- ***	N.S.	- ***	- *	- *
Early resiliency behavior								
Early school related adjustment	N.S.	+ *	N.S.	- *	N.S.	N.S.	- **	- *
Prosocial behavior (parent)	N.S.	N.S.	N.S.	N.S.	+ **	N.S.	- *	N.S.
Prosocial behavior (teacher)	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Internalizing Bx (parent)	N.S.	N.S.	N.S.	N.S.	N.S.	+ **	+ ***	+ **
Intern. Bx (teacher)	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Extern. Bx (parent)	- ***	N.S.	N.S.	N.S.	+ **	+ ***	+ **	+ ***
Ext. Bx (teacher)	- *	N.S.	N.S.	N.S.	+ ***	+ ***	N.S.	+ ***
Interaction	N/A	N/A	N/A	-*	N/A	N/A	N/A	N/A

Note. . Retention₁ is parent-reported externalizing behavior x gender, while retention₂ is teacher-reported externalizing behavior x gender. N/A = Not Applicable.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Chapter 5: Discussion

The purpose of this study was to examine the relations among early academic, demographic, and behavioral variables and school-based outcomes over time. In contrast to previous studies that have focused solely on academic *or* behavioral variables, this study examined both academic *and* behavioral variables as both predictors and outcomes. To accomplish this purpose, data from the ECLS-K database were examined, with demographic, early academic, and behavioral variables measured in kindergarten and outcomes measured in eighth grade. This chapter highlights the major findings of this study and describes how this study has advanced the knowledge base in risk and resiliency. Strengths, implications of the findings, limitations, and directions for future research also are discussed.

Interrelations Among Early Academic and Behavioral Variables in Kindergarten

The focus of the first research question was on the interrelations between academic and behavioral variables in kindergarten. This research question contained several parts: (a) how early behavioral variables (i.e., school-related emotional adaptation, prosocial behavior, externalizing behavior, and internalizing behavior) are related to one another; (b) how early academic variables (early direct reading testing, early direct math testing, reading Academic Rating Scale, math Academic Rating Scale, and first-time kindergarten status.) are related to each other; and (c) how early behavioral variables are related to early academic variables. Because few previous studies have examined these variables simultaneously as predictors of outcomes, interrelations were examined in the current study to investigate the possibility of multicollinearity. Results showed that correlations between early behavioral variables were

relatively low (r ranging from $-.57$ to $.28$), which suggested that these variables were relatively independent of each other. The strongest relation among early behavioral factors was a negative correlation between teacher-reported prosocial behavior and teacher-reported externalizing behavior ($r = -.57, p < .001$), which was consistent with previous research (Breslau et al., 2009; Rock, 2002). This suggested that kindergarten students who were perceived by teachers as demonstrating better prosocial behavior were also perceived as exhibiting fewer symptoms of externalizing behavior. Additionally, a weak but significant positive correlation was found between teacher-reported internalizing and externalizing problems ($r = .25, p < .001$), which also was consistent with the findings of Breslau and colleagues (2009). Although a different behavioral scale was used in the current study than was used in Breslau et al. (2009), the findings of the current study were similar, which suggested that internalizing and externalizing behaviors were not completely independent of each other. In addition, a moderate significant positive correlation was found in the current study between parent-reported internalizing and externalizing problems ($r = .27, p < .001$). These findings in combination suggested that mental health concerns were not distinctively categorical even among an early elementary school population (Graber & Sontag, 2009). The current study expanded on Breslau's research as only teacher-reported symptoms were measured in that study.

In terms of interrelations between the early academic variables (early reading direct testing, early math direct testing, reading Academic Rating Scale, and Math Academic Rating Scale, and first-time kindergarten status), there was a strong, positive correlation ($r = .84, p < .001$) found between kindergarten teachers' ratings on the spring Academic Rating Scale (ARS) for math and reading. This suggested that teachers' perceptions of early reading and math

performance were strongly related to each other. As a result of this finding, the ARS was collapsed into a Combined ARS score for all subsequent analyses.

With regard to the relations between early behavioral and early academic variables, results showed that correlations were relatively low (ranging from $r = -.21$ to $.35$). This suggested that these variables could be considered relatively independent of one another. The most significant positive correlation between early academic and early behavioral variables was found between the reading Academic Rating Scale (ARS) and teacher-reported prosocial behavior in kindergarten ($r = .35, p < .001$), demonstrating that students who were perceived by teachers as better readers also are perceived as having higher levels of prosocial behavior. The weakest correlation was found between first-time kindergarten status and parent-reported prosocial behavior ($r = .01, p = N.S.$), which suggested that those who were repeating kindergarten were not perceived by parents as different in prosocial skills than those who were first time kindergarteners. A significant negative correlation also was found between the kindergarten Combined Academic Rating Scale and teacher-reported internalizing behavior in kindergarten ($r = -.21, p < .001$), which corresponded with Normandeau and Guay's (1998) findings of a negative relation between academics and internalizing behavior among French Canadian elementary aged-children. Overall, the correlational analyses conducted as part of the current study suggested that most of the predictors could remain as independent variables as the correlations of conceptually similar variables were below the predetermined threshold of $.70$, with the exception of the Academic Rating Scale measures.

Early Academic and Behavioral Variables and Outcomes in Early Adolescence

The second research question in this study was focused on how early academic and behavioral variables are related to outcomes in eighth grade. The current study sought to

determine risk and protective factors that might contribute to Early Warning Systems, as much of the literature to date has focused on the latter portion of middle school and high school (Reschly & Christenson, 2006; Jerald, 2006; Neild & Balfanz, 2006.) It is important to expand this area of research to determine ways to prevent dropout and school failure (Archwamety & Katsiyannis, 2000; Malmgren & Leone, 2000).

In the current study two types of eighth grade outcomes were examined: a) academic outcomes and b) behavioral outcomes. Academic outcomes are important for a variety of reasons. For example, various studies have found a negative relation between academic achievement and incarceration, with about 70% of the incarcerated population not completing high school (Tsai & Scomegna, 2012; Western & Petit, 2010). Perhaps surprisingly, the U.S. has had the highest incarceration rate of the world's population since 2002. Moreover, a previous study suggested that secondary school academic performance, including standardized test scores and grades, significantly predicted a trajectory of maladjustment (Bowers, 2010; Rumberger, 1995). In addition, Neild and Balfanz (2006) previously found that poor academic performance in eighth grade (e.g., an "F" in math or reading) predicted future retention, highlighting the importance of academic performance to secondary outcomes.

Behavioral outcomes also were explored as previous studies have found relations between externalizing behavior and problems in the community (Loeber & Farrington, 1998). Within the broad category of behavioral outcomes, suspension, mental health diagnoses, and mental health symptoms (internalizing and externalizing) were included. Consideration of these different types of behavioral outcomes was important as research suggests relations between adolescent mental health and mental health into adulthood (Huffman et al., 2000; Ialongo, Edelsohn, & Kellam, 2001; Ialongo, Edelsohn, Werthamer-Larson, Crockett, & Kellam, 1996;

Shinn et al., 1987; Walker et al., 1998.) Suspension was examined as behavioral issues at school are associated with generalizing these types of problems into the community (Loeber & Farrington, 1998). Identifying mental health symptoms allows for treatment of these concerns before they become lifelong mental health issues. Importantly, a mental health diagnosis before age 14 years old is associated with more vulnerability than at a later age (Kessler et al., 2005). Results of academic and behavioral outcomes are discussed below.

Academic outcomes. The current study measured four academic outcomes in eighth grade through (1) direct, standardized testing in reading, (2) direct, standardized testing in math, (3) grades, and (4) retention status as of the 2006-2007 school year. An Item Response Theory (IRT) score was used for standardized testing scores to measure growth more precisely over time. All of these academic variables measured during adolescence remained categorized as independent outcomes based on the correlation values discussed above. Demographic and early academic variables, as well as the central research focus, early behavioral factors, were examined in relation to these behavioral outcomes. Of the demographic and early academic variables, math, gender, and the Combined Academic Rating Scale (ARS) were the most consistent, significant predictors of academic outcomes. Several early academic variables, including the Combined Academic Rating Scale (ARS) and direct math assessment, were all significant positive predictors of reading and math standardized achievement tests in eighth grade. Early reading direct testing was also positively related to later reading performance. Generally, the patterns found in the current study correspond with the previous research showing moderate positive relations between early achievement and later achievement (e.g., La Paro & Pianta, 2000). The current study expanded on this knowledge by

demonstrating that these relations were found from kindergarten to eighth grade.

Overall, many of the risk and resiliency factors (e.g., parent or teacher-reported early prosocial behavior and parent- or teacher-reported early internalizing behavior) were not significantly related to any of the academic outcomes. Of the early behavioral variables, early school-related adjustment and parent-reported externalizing behavior were the most consistent predictors of academic outcomes.

The researcher had hypothesized that internalizing problems would have a negative relation with achievement. However, there is a relative dearth of knowledge about internalizing behavior in early childhood as a potential risk factor for later academic performance, and the extant literature has been ambiguous. Other studies have found negative relations between internalizing problems and older children's academic performance (Henricsson & Rydell, 2006). In the current study, there were no significant relations found between early internalizing problems (reported by parents or teachers) and any of the academic outcomes, which is aligned with the general finding from Duncan and colleagues' (2007) study. One hypothesis that internalizing behavior was not significantly related to achievement is based on the law of the Yerkes-Dodson curve, which is an inverted U shape that illustrated arousal in relation to optimal performance. When there is too little arousal, a participant is not likely to perform well on a task; however, if there is too much arousal then a participant is unlikely to perform well either due to related physiological effects (Cohen, 2011). The current sample's student mean for early internalizing behavior, which included items related to low self-esteem, anxiety, sadness, and loneliness, was relatively low with 1.55 for parent-reported and 1.52 for teacher-reported out of a potential four- point scale.

Moreover, prosocial behavior was not significantly related to achievement as was anticipated (Diperna & Elliot, 2000). One potential reason for this finding may be that prosocial behavior, or interpersonal skills, are only one part of academic enablers, as study skills, motivation, and engagement are also elements (Elliot et al., 2004). Another potential reason for the limited predictive power of prosocial behavior was in the previous study prosocial behavior was more conceptually related to academic constructs than in the current study (Diperna, Elliot, & Volpe, 2005; Elliot et al., 2004).

Based on the academic interactions examined, there were and two significant interactions found for retention. Each of these interactions included gender and externalizing behavior. Both parent- and teacher-reported externalizing behavior was positively associated with retention, and males were more likely overall to be retained. However, a significant interaction found that females were more likely than males to be retained when they were reported as having extreme externalizing problems in kindergarten.

Direct testing in reading. Students were assessed on a standardized reading test in eighth grade. Several demographic and early background variables were significant predictors of reading in adolescence, accounting for about 40% of the variance in the first model. Specifically, gender, socioeconomic status, race, first-time kindergarten status, early reading assessment, early math assessment, and Combined Academic Rating Scale all were significant predictors of adolescent reading achievement. Males earned lower scores on adolescent reading achievement than females did ($\beta = -3.29, p < .01$). Students with high socioeconomic status composites in kindergarten scored better than students with low socioeconomic composites ($\beta = 7.07, p < .001$), which corresponded with findings from Sirin's meta-analysis (2005). Students who were Black had lower scores on eighth grade reading achievement ($\beta = -12.39, p < .001$) than their

Caucasian counterparts, which is also aligned with previous research patterns (Jencks & Phillips, 1998; Mickelson & Greene, 2006). Additionally, being a first-time kindergarten student also had a positive association with adolescent reading achievement ($\beta = 6.48, p < .01$), which suggested that students who were retained in kindergarten did not eventually catch up in reading to their non-retained peers. As expected, performance on early direct standardized reading tests ($\beta = .20, p < .01$) and early direct standardized math tests ($\beta = .73, p < .001$) in kindergarten were positively related to reading performance in the eighth grade. Finally, the Combined ARS was a positive and significant predictor of reading assessment performance in eighth grade ($\beta = 4.90, p < .001$).

Regarding the early protective variables, none of them were significant predictors of reading in eighth grade when early academic performance and demographic variables were controlled. Once risk factors were also accounted for in terms of variance, only an additional 1% of variance could be explained within the overall main effects model. However, there were two risk factors (i.e., parent-reported and teacher-reported externalizing behavior) that were negatively related to long-term reading performance in eighth grade ($\beta = -2.53, p < .01$; $\beta = -2.79, p < .05$, respectively), which is aligned with previous studies (e.g., Hooper et al., 2010, Huesman et al., 1987; McLeod & Kaiser, 2004; Vaughn et al., 1992). This finding extended the work of Vaughn et al. (1992), who only examined teacher-reported externalizing behavior. The current study found that both parent and teacher-reported externalizing behavior were negatively associated with reading achievement.

Overall, demographic and early academic variables explained the majority of variance for reading outcomes in eighth grade. Significant predictors included gender, socioeconomic status composite, race, first-time kindergarten status, reading assessment in kindergarten, math

assessment in kindergarten, and Combined Academic Rating Scale. No proposed behavioral resiliency factors were found to be significant positive predictors of reading, although parent-and teacher-reported externalizing behavior was found to be a negative significant predictor of reading ($\beta = -2.53, p < .01$; $\beta = -2.79, p < .05$, respectively). The finding of a negative relation between externalizing behavior and reading is aligned with previous studies (e.g., Bub et al., 2007; Hinshaw 1992a; Morgan et al., 2008).

Direct testing in math. Within the current study, a second component of academics during adolescence was measured through a standardized math assessment. As with reading, demographic and early academic variables accounted for a large proportion of the variance in eighth grade math scores (i.e., about 43%). Specifically, gender, socioeconomic status, race, first-time kindergarten status, early direct reading assessment, early direct math assessment, and the Combined Academic Rating Scale were significant predictors of standardized math IRT scores. Male students had higher scores on standardized math achievement in eighth grade than their female counterparts ($\beta = 2.59, p < .01$), which is aligned with some studies (National Center for Education [NCES], 2001; 2003; Raffaele Mendez, Mihalas, & Hardesty, 2006). Socioeconomic status was positively associated with math achievement scores in eighth grade, which meant that students from more affluent backgrounds performed better than students from less affluent backgrounds ($\beta = 5.03, p < .001$). Additionally, students who were Black had lower scores on math achievement than Caucasian students ($\beta = -9.51, p < .001$). The socioeconomic status composite and race findings is also aligned with previous research studies (NCES 2001; 2003). Students who were first-time kindergarteners scored better on the math assessment in eighth grade than students who had previously attended kindergarten ($\beta = 8.52, p < .001$). This finding extended a previous research study using the ECLS-K database that found that retained

kindergarten students performed worse on first grade standardized math assessments than students who were first-time kindergarten students (Hong & Raudenbush, 2006). Further, the current study's findings support previous research that retention is associated with long-term negative academic outcomes (Raffaele Mendez et al., 2014).

With regard to early academic variables and math scores in eighth grade, kindergarten standardized math achievement scores were significant predictors of standardized math scores ($\beta = .89, p < .001$), which suggested continuity of skills. Moreover, the Combined ARS positively predicted performance in math testing in eighth grade ($\beta = 4.94, p < .001$). Previous research studies, including those using the ECLS-K data, suggest that early academic performance, especially early math performance, is related to future academic performance (Duncan et al., 2007). The current study suggested that this pattern extended from early childhood into early adolescence. This supports the need for early intervention, as early academic performance, which is part of school readiness, appears related to long-term academic performance.

Regarding the early behavioral factors, one promotive factor, early school-related emotional adjustment, was found to be a significant positive predictor of standardized math achievement in eighth grade ($\beta = 3.60, p < .05$). A promotive factor is when regardless of an individual's vulnerability, the factor is related to positive outcomes (Leffert et al., 1998; Sameroff & Fiese, 2000). The measurement of early school-related adjustment is a relatively new area of investigation. The current study measured student adjustment based on parent report rather than primarily examining the teacher-student relationship (Pianta & Steinberg, 1992). One hypothesis was that students whose initial emotional school adaptability was higher may have more problem-solving skills, which are potentially related to long-term math achievement. None of the other early behavioral risk factors examined in this study were found to be significant

predictors of math achievement in eighth grade. Unlike for the outcome of reading achievement, early externalizing behavior did not significantly predict math achievement in eighth grade. A hypothesis for this difference may also be related to there being more externalizing behaviors typically found among males, and males were also negatively associated with eighth grade reading performance.

Grade point average. The third component of academic performance examined in this study was parents' report of children's GPA in spring of eighth grade. GPA was measured on a five-point scale (A = 4.0, B = 3.0, C = 2.0, D = 1.0, and F = 0.0). Using the average score of 2.0, the scale was dichotomized, with less than 2.0 = 1 and 2.0 or above = 2, as was done in a previous, longitudinal study (Ensminger & Slusarcick, 1992).

Demographic and early academic variables, including gender, socioeconomic status composite, and early direct math standardized assessment were significant predictors of GPA. Males were more likely to have lower GPAs than females ($B = -3.26, p < .01$), which corresponded with previous studies (e.g., American Association of University Women Educational Foundation [AAUWEF], 1998; Cole, 1997; Pomerantz, Altermatt, & Saxon, 2002; Raffaele Mendez, Mihalas, & Hardesty, 2006). Students from high socioeconomic statuses were reported as having higher GPA than students from low socioeconomic statuses ($B = .60, p < .05$), which also was reported in Sirin's (2005) meta-analysis. Kindergarten students who performed better on math assessments were also reported to have higher GPAs than students who scored lower on math assessments ($B = .07, p < .05$).

There were no significant racial/ethnic variables or promotive factors that predicted GPA. Gender, SES composite, and early math performance were the only demographic and/or academic variables that were significant positive predictors of GPA. In terms of risk factors,

parent-reported externalizing behavior was a significant negative predictor of GPA, although teacher-reported externalizing behavior did not produce the same finding. The latter finding aligned with Wentzel's (1993) results that externalizing behavior was not significantly associated with GPA. In this previous cross-sectional study, all data were gathered in middle school, and peer nomination data were for externalizing type, which was moderately coordinated with teacher response. It should be noted that parent and teacher early externalizing behavior reports were only somewhat correlated in this study ($r = .28, p < .001$), which aligned with previous research (Achenbach et al., 1987).

Retention. The fourth and final component of academic outcomes was retention. Students who had been retained were compared to students who were at or above grade level (2006-2007) based on a special education teacher questionnaire (for students assigned to a special education teacher), as well as from information collected by the field staff from schools. Two significant interactions were found with gender as a moderator between parent-reported early externalizing reported behavior and retention, as well as between teacher-reported early externalizing behavior and retention. The patterns were similar across both raters, with males more likely to be retained than females in eighth grade in general but females reported as having more extreme early externalizing behavior as more likely to be retained than males with this type of behavior. Based on the researcher's exploration of the literature, it did not appear that this particular relation had been previously explored. Within the extant literature, some of the variables examined were demographic variables and standardized test scores and usually the study design was short-term longitudinal one (Dauber & Entwisle, 1993). Typically males, as well as students from low socioeconomic backgrounds, have been positively associated with retention. A potential hypothesis that early adolescent females with teacher-reported (as well as

parent-reported) externalizing behavior were more likely to be identified for retention than males are that these types of early behavioral issues may seem less normative among females than males.

Behavioral outcomes. The current study measured behavioral outcomes in eighth grade through (1) suspension, (2) presence of an educational/mental health diagnosis, 3) internalizing behavior, and (4) externalizing behavior. All of these behavioral variables measured during adolescence remained categorized as independent outcomes based on the correlational values and a conceptual basis.

Demographic and early academic variables, as well as early behavioral factors, were examined in relation to these behavioral outcomes. Of the demographic variables, one of the racial/ethnic categories was the most frequent predictor of behavioral outcomes, with the Asian race negatively predicting all of the aforementioned behavioral outcomes. This means that Asian students were less likely than Caucasian students to be reported as having any of the problem behavioral outcomes listed above. Some previous studies have included the Asian population; however, often it was too small (e.g., .2% or 12 students) to conduct inferential statistics of suspension differences (Costenbader & Markson, 1998). In terms of mental health issues (both internalizing and externalizing), Sue (1994) hypothesized that the “low official rates of mental health ... may be related to traditional Asian cultural values [e.g., Chinese and Japanese emphasize collectivism], or to negative experiences with inappropriate Western mental health services rather than to a healthier mental population” (p. 293).

Of the demographic variables, gender was the second most frequent significant predictor of behavioral outcomes, with males having significantly more behavioral concerns with the exception of internalizing problems, which was not significant. The current study’s findings of

greater likelihood of suspension among males than females aligned with Coutinho and Oswald's (2005) gender disproportionality research. The current study also found that Black students were more likely to have had a suspension compared to Caucasian peers, which corresponded with Tenenbaum and Ruck's (2007) study.

Continuity and discontinuity of behavioral issues also were examined in the present study. Proposed risk factors, such as parent and teacher-reported early externalizing behavior, were most often associated with behavioral outcomes in eighth grade. Of the proposed resiliency factors, teacher-reported prosocial behavior was the least predictive of the long-term behavioral outcomes, as it was not significantly associated with any of the behavioral outcomes. Surprisingly, parent-reported prosocial behavior was associated with suspension; however, teacher-reported prosocial behavior was not significantly related to suspension. This may be partially related to how parent prosocial behavior was measured with an emphasis on peer relationships rather than related to interpersonal skills related to academics. As predicted, early internalizing behavior was a significant positive predictor of early adolescent internalizing symptoms (Bornstein et al., 2010; Colman et al., 2007; Henricsson & Rydell, 2006; Obradović et al., 2009); however, this was only significant based upon early parent ratings. Early externalizing behavior was a significant positive predictor of later externalizing behavior, which was also similar to previous findings (Loeber et al., 1993, Moffit et al., 2002; Silver et al., 2005). In the current study, regardless of the initial kindergarten rater, parent or teacher, early externalizing behavior predicted eighth grade externalizing behavior.

The current study expanded behavioral outcome research in several ways. There were various behavioral outcomes explored within the same study over a long duration. There was also a simultaneous investigation of both internalizing and externalizing behaviors as predictors

and outcomes, which has not often been examined in the literature (e.g., McLeod & Kaiser, 2004). Further, the current study included parent and teacher reports of early behavior (Henricsson & Rydell, 2006) and a continuum of symptoms rather than a diagnosis or cutoff points in many previous studies (Pihlakoski et al., 2006; Luby et al., 2014). The current study also found that parent-reported early externalizing behavior significantly predicted internalizing symptoms in early adolescence, which is aligned with Pihlakoski and colleagues' findings (2006). The study also explored potential moderators, although no significant interactions were found among those tested for behavioral outcomes.

Suspension. A suspension was defined as whether parents reported the presence of any in or out of school suspension for their child from kindergarten through the spring of eighth grade. Within the current study, demographic, early academic variables, and a proposed early resiliency variable were found to be significant predictors of the presence of a suspension. Specifically, gender, socioeconomic status composite, race/ethnicity, and the Combined ARS in kindergarten were associated with suspension. Males were more likely to be reported having suspension than females ($B = .98, p < .001$), which corresponded with Pas and colleagues' (2011) findings. Socioeconomic status composite was negatively associated with the presence of suspension ($B = -.36, p < .001$) such that highest SES youth were less likely to have had a suspension. Black students were more likely to be reported as being suspended ($B = .92, p < .001$) than their Caucasian peers, which aligned with past studies (Wright et al., 2014; Kaufman et al., 2010). The current study expanded the research in this area because it allowed for comparison of different racial groups. This was possible due to the large sample size in the ECLS-K dataset. Typically, there is not a large enough diversity within a sample to examine subgroups. Contrary to the prediction, there was no significant interaction found between Black race and gender. One

potential reason for this difference from past research may be that the current study measured presence or absence of suspension rather than number of suspensions. Additionally, although unanticipated, the Combined ARS score was found to be positively associated with the presence of suspension in spring of eighth grade ($B = .24, p < .05$). Neither early reading nor math assessment were significantly associated with behavioral outcomes. As such, the current study's trends overall did not suggest that achievement was often related to long-term behavioral outcomes.

In terms of the early behavioral variables, there was one significant proposed 'resiliency' factor and several early behavioral risk factors that predicted presence of suspension. Parent-reported prosocial behavior was positively associated with suspension ($B = .32, p < .01$), which was contrary to the anticipated finding and therefore it would be considered a resiliency factor. However, this trend was not found among teacher raters. Differences across raters in prosocial behavior correspond with previous research findings (Fabes et al., 1999; Veenstra et al., 2008). Also, prosocial behavior has been identified as an academic enabler for achievement (Diperna & Elliot, 2000), and not for behavioral outcomes. One hypothesis for this unexpected finding may be related to the content of the parent's prosocial scale, which items mostly related to peer interaction. These students who parents identified as being comfortable with peers and they may potentially be too talkative or disruptive in class, resulting in a potential suspension. There was no significant relation found between early internalizing behavior and suspension, although across raters (i.e., parent and teacher) early externalizing behavior was positively associated with having at least one suspension by eighth grade ($B = .37, p < .001$; $B = .50, p < .001$, respectfully).

Mental health/educational diagnoses. In the spring of eighth grade, parents reported on whether a professional diagnosed their child with one or more various mental health or educational diagnoses. The data were analyzed in a binary fashion (yes = 0 or no = 1). During this time point, students who had low coordination or whose vision was corrected were not considered as a potential disability classification. However, if a parent reported that a student's vision could not be corrected, then the student would be considered to qualify for a disability. Parents were asked in this question if their child ever had been considered as having a disability (Tourangeau et al., 2009).

Several demographic and early academic variables predicted parent-reported mental health/educational diagnoses. Gender, race, first-time Kindergarten status, math assessment, and Combined ARS were found to be significant predictors of the presence of an educational/mental health diagnosis as reported by parents in eighth grade. Males were more likely than females to be identified as having an educational/mental health diagnosis ($B = .31, p < .05$). Students who were Hispanic ($B = -.52, p < .01$), Black ($B = -.73, p < .01$), Native American ($B = -.75, p < .01$), and Asian ($B = -1.20, p < .01$) were reported as less likely to have an educational/mental health diagnosis than Caucasian students. First-time kindergarten status was negatively associated with a mental health/educational diagnosis in eighth grade ($B = -1.04, p < .001$). There was also a negative association between the early math assessment and educational/mental health diagnosis ($B = -.05, p < .001$). Similarly, the Combined ARS was negatively associated with an educational/mental health diagnosis in eighth grade ($B = -.34, p < .001$).

There were no significant behavioral resiliency factors but several early behavioral risk factors that predicted an educational/mental health diagnosis. Parent-reported early internalizing behavior was positively associated with an educational/mental health diagnosis in eighth grade

($B = .42, p < .01$). Additionally, both parent- and teacher-reported early externalizing behavior (separate predictors) were positively associated with an educational/mental health diagnosis in eighth grade ($B = .38, p < .001$; $B = .60, p < .001$, respectively). These trends suggest some degree of behavioral continuity over time.

Internalizing symptoms. In the current study, internalizing symptoms were reported by parents in the spring of eighth grade. The measure included parent report on items including: worry, unhappiness, nervousness, illness, fear, being bullied, and loneliness. Demographics and early academics accounted for 5% of variance when these variables were entered as independent block. Race, first-time kindergarten status, and math assessment were significant predictors of internalizing problems within the final main effects model. The data suggested a significant negative relation between parent-reported internalizing problems and Asian race ($\beta = -.07, p < .05$). There was also a negative significant relation between parent-reported internalizing problems and Black race ($\beta = -.08, p < .001$), as well as between parent-reported internalizing problems and Native American race ($\beta = -.09, p < .001$). The current researcher hypothesizes that parents of minority students underreported internalizing symptoms in alignment with Gary's (2005) theory that individuals from different backgrounds may face a 'double stigma' of facing discrimination and do not want to be further isolated. However, it should be noted that this trend was not found among parent reports of Hispanic students for internalizing symptoms. It was found that Asian parents were also less likely to have reported internalizing symptoms.

As an independent block, early behavioral risk and resiliency factors accounted for the most variance (9%) other than the main effect model. Within the final main effect model, there were two significant promotive factors that negatively predicted parent-reported internalizing

behavior. Parent-reported early school-related emotional adjustment was negatively associated with internalizing problems in eighth grade ($\beta = -.06, p < .01$). The way early school-related adjustment was measured was different in the current study than in previous studies, which emphasized on the teacher-student relationship (Hamre & Pianta, 2001). The current study focused instead on parent perceptions of children's adaptation. Parent-reported early prosocial behavior was also negatively associated with internalizing behavior in eighth grade ($\beta = -.03, p < .05$), which is aligned with Henricsson and Rydell's (2006) findings.

Early behavioral risk factors, including internalizing behavior, were related to similar issues over time. Parent-reported internalizing behavior was positively associated with internalizing problems in the spring of eighth grade ($\beta = .12, p < .001$), which aligned with previous research that suggested continuity (Bornstein et al., 2010; Colman et al., 2007; Henricsson & Rydell, 2006; Obradović et al., 2009). Henricsson and Rydell (2006) found moderate stability between internalizing problems measured over time whereas the current study found a relatively weak relation between these problems over time. Some potential reasons may be due to: (1) the length of the current study, (2) fluctuations in symptoms, or (3) mental health treatment, which may have occurred. Another major finding was that parent-reported externalizing behavior in kindergarten was positively related to parent-reported internalizing problems in the spring of eighth grade ($\beta = .04, p < .01$), which corresponded with the direction found within Pihlakoski and colleagues' (2006) results.

The different pathways of risk factors into the same outcome suggest equifinality, which is seen in situations where individuals possess different risk factors but have the same outcome (Cicchetti & Rogosh, 1996). However, the data suggest a complex relation. For example, parent-reported internalizing and externalizing problems in the spring of eighth grade were moderately

correlated ($r = .49, p < .001$), but there was a weak correlation between parent-reported internalizing and externalizing behavior in kindergarten ($r = .21, p < .001$). Of note different measures were used during kindergarten and eighth grade to measure internalizing and externalizing behavior. During kindergarten, teacher-reported internalizing and externalizing behavior were also weakly correlated ($r = .25, p < .001$). However, no comparison could be made between kindergarten and eighth grade for teacher ratings because this type of data collection was omitted. Overall, early externalizing behavior (reported by parents) appeared to predict internalizing as well as externalizing symptoms in adolescence. This finding suggested the importance of externalizing behavior as a risk factor for both internalizing and externalizing symptoms.

Externalizing symptoms. The externalizing symptoms about which parents were asked to report on their children in eighth grade included: temper, cheating, stealing, fighting, fidgeting, and distractibility. Demographic and early academic variables were found to be significant predictors of externalizing symptoms, accounting for approximately 12% of the variance when they were only the block of variables included within the model. Within the final main effects model, gender, SES composite, race, and math assessment were significant background variables that predicted externalizing problems. There was a negative association between Asian race and externalizing behavior ($\beta = -.11, p < .001$). There also was a negative association between Hispanic race parent-reported externalizing behavior ($\beta = -.05, p < .01$), as well as between Native American race and parent-report reported externalizing behavior ($\beta = -.14, p < .001$.) Kindergarten math assessment scores also were negatively associated with externalizing problems ($\beta = -.01, p < .001$). The pattern observed between achievement and externalizing symptoms was as anticipated (Bub et al., 2007; Hinshaw, 1992a; Wentzel, 1993). As

independent blocks in the model, the demographic and early risk behavior and early academics and early prosocial blocks accounted for the most variance (23%), with the exception of the main effects model, which accounted for 26%.

Notably, the early behavioral factors contributed to the variance of externalizing behavior in an important way. When early risk and resiliency variables were entered independently as a block, they accounted for 21% of variance. Within the main effects model, one significant promotive factor and several early behavioral risk factors predicted parent-reported externalizing behavior. Considered within the context of the final main effects model, early school-related emotional adjustment was negatively associated with externalizing problems ($\beta = -.06, p < .01$). Again this was a different measure of early adjustment than typically measured (Hamre & Pianta, 2001), but this finding is aligned with early school-related emotional adaptation serving as a promotive factor. Parent-reported internalizing behavior was positively related to externalizing behavior in eighth grade ($\beta = .05, p < .01$). Lastly, both parent and teacher-reported early externalizing behavior in kindergarten were positively associated with externalizing behavior in eighth grade ($\beta = .14, p < .001$; $\beta = .11, p < .001$), respectively. The continuity of externalizing behavior is aligned with the findings of past studies (Loeber et al., 1993), Moffit et al., 2002), Silver et al., 2005).

Strengths of the Current Study

The current study featured several methodological strengths. One strength of the current study was that it provided a more comprehensive youth assessment through incorporating various measurement (e.g., direct assessment and rating scales), in addition to multiple sources of data (i.e., parents and teachers). The current study also incorporated a more comprehensive assessment through a concurrent examination of early academic and behavioral variables in kindergarten as predictors, as well as academic and behavioral outcomes in eighth grade.

Another strength of the current study was its longitudinal nature, which improved upon previous studies with cross-sectional or short-term longitudinal design (Compas & Reeslund, 2009). This type of research design is encouraged in developmental research as it helps examine relations between variables over time (Baltes & Nesselroade, 1979; Menard, 1991). Moreover, the study accounted for potential systematic differences (e.g., child and family background) across school settings (i.e., elementary and secondary school). Lastly, a strength of the current study was the kindergarten sample was nationally representative. The sample included various types of schools, including private and public schools in different geographical regions, as well as schools with full and half day kindergarten programs. A range of students, including those with disabilities, were participants within the study. Consequently, the study's sample should promote generalizability of findings to various populations.

Theoretical Implications

The current study featured two central frameworks of developmental psychopathology (Sroufe & Rutter, 1984) and risk and resiliency (Garmezy, 1974.) The aims of the study were to examine if there has been continuity or discontinuity of mental health issues and what were the trajectories of mental health symptoms over time (equifinality and/or multifinality). Parent-reported internalizing behavior in kindergarten was found to be significantly related to internalizing symptoms in eighth grade, which suggested continuity of internalizing behavior in alignment with Bornstein and colleagues' (2010) findings. However, teacher-reported internalizing behavior was not significantly related to internalizing symptoms in eighth grade. This may be partially accounted for the different raters as some past research studies have suggested less consistency across raters for internalizing issues, especially among the early adolescent population (Achenbach et al., 1987). Parent- and teacher-reported externalizing

behavior was positively associated with externalizing symptoms in eighth grade, which suggests continuity of behavior across raters. Previous research also suggested the continuity of externalizing behavior over time (e.g., Barkley, 1998).

There was also indication of equifinality, which is part of risk and resiliency theory and is when there are different initial risk factors that result in the same outcome. Parent-reported externalizing behavior was also related to internalizing symptoms in eighth grade. Consequently, two different risk factors, early parent-reported externalizing behavior and early parent-reported internalizing behavior, were associated with long-term externalizing symptoms. Conversely, both parent- and teacher- reported externalizing behavior was associated with externalizing symptoms in early adolescence, while parent-reported externalizing was related to internalizing concerns in early adolescence with the latter finding aligning with Pihlakoski and colleagues' (2006) results. Although it may be more difficult to discern internalizing behavior than externalizing behavior, the current study's findings suggest that internalizing behaviors may also be related to externalizing concerns.

In terms of supplementary theory, Bronfenbrenner (1979) and Christenson (2008) also contributed to the study in terms of consideration of ecological context. The current study used a multi-source method approach in order to garner a more comprehensive perspective of the child. There are unalterable variables, like being Black that was still positively associated with suspension even after accounting for socioeconomic status. Students with both risk factors are more likely to be risk for suspension, because of the accumulation of risk factors, which is part of the risk and resiliency theory above. Although some of the variables cannot be easily (if at all) altered, it is important to pinpoint vulnerable populations to inform the practical implications for prevention and intervention efforts.

Practical Implications

Overall, the multiple and logistic regression results suggested that demographics and early academics account for the majority of variance in academic outcomes, but early risk behavior and resilience also contributed to academic and especially to behavioral outcomes. There were five primary implications of the study for practice in the schools. Each is described in detail below.

First, it was noted that youth who were retained in kindergarten had worse outcomes in eighth grade than those who were first-time kindergarteners. First-time kindergarten students had higher reading and math assessment IRT scores in eighth grade than retained peers. Retention may be a potential academic risk factor. Moreover, first-time kindergarten status was negatively associated with a parent-reported educational/mental diagnosis and internalizing behavior problems in eighth grade. This suggested that kindergarten retention is not associated with positive outcomes for youth over time. This is consistent with the findings of a recent study, which found that retained students had worse long-term outcomes, such as lower achievement in middle school in reading, language, and math compared to typically progressing peers, even after controlling for socioeconomic status measured by lunch status (Raffaele Mendez et al., 2014). The findings of the current study that students retained in kindergarten are also more likely to have an educational or mental health diagnosis and greater internalizing concerns in eighth grade suggest that retention has not only negative academic outcomes but also negative implications for mental health. Overall, the findings of the current study do not support the practice of kindergarten retention if the intention of that practice is to close the gap between students who are not meeting kindergarten expectations and their typically developing peers. However, it should be noted these findings are correlational and not causal so there may be other

underlying risk factors, such as school context, including lack of access to interventions, placement in a failing school, or school climate overall.

Second, another important early academic variable noted was performance on early standardized test scores, especially in math in kindergarten. The early math IRT score was positively associated with later achievement and negatively associated with mental health issues. Specifically, early math IRT scores were positively associated with both reading and math scores in eighth grade. Moreover, math IRT scores were negatively associated with an educational/mental health diagnosis, internalizing behavior, and externalizing behavior in eighth grade. Notably, reading scores had no significant associations with behavioral measures. This suggests that early math performance was more important to the types of outcomes measured in eighth grade than is early reading performance. This is interesting given the strong focus on reading in many elementary schools. The findings of the current study argue for strong instruction and support in math, as this area is broadly tied to general problem-solving (Schoenfield, 1992). It should be noted that there has been a recent shift within several states in the U.S to emphasize Science, Technology, Engineering, and Math (STEM), and the findings of the current study suggest that this is likely to be beneficial to students over time.

Third, a demographic trend was found in terms of how likely parents were to report mental health concerns among their children in eighth grade. Specifically, parents of Black, Asian, Native American, and multiracial children rated their children as having less internalizing concerns in early adolescence than did parents of Caucasian children. Parents of Native American, Hispanic, and Asian children also rated their children as having less externalizing concerns in early adolescence compared to parents of Caucasian children. Additionally, parents of Black, Asian, Native American, and Hispanic children were less likely to report an

educational/mental health diagnosis compared to parents of Caucasian children. These differences found brought into question whether there were true differences found among these adolescent groups or if these differences emerged because of cultural norms or values between races in reporting of symptoms/disorders. Gary (2005) proposed that ethnic minorities (e.g., Black, Hispanic, and Native American) may face a ‘double stigma’ as they may face discrimination and prejudice already, and they do not want to be further alienated. Also cultural norms may also prevent an individual from recognizing need for mental health for themselves or others. For example, as Sue (1994) indicated, in certain Asian cultures (e.g., Chinese and Japanese) there is often a focus on the family unit rather than on the individual, which may result in underreporting of mental health symptoms. Also Sue (1994) provided an overview of how Asian individuals may be reluctant to work with Western mental health practitioners, as they fear disgracing their family with mental health concerns.

There are some studies that suggest that there are significant mental health concerns among these populations that may be undertreated. For example, recently Bridge (2015) found there was a significant increase of suicide rates among young male Black youth, although suicide rates had declined during the same time period (from January 1993 to end of December 2012) among Caucasian youth. Although suicidality was not measured within the current study, internalizing symptoms are often correlated with depression and risk for suicidal behavior (Merrell, 2008a).

Another potential hypothesis for differences across racial/ethnic in internalizing symptoms was that potential protective factors offset the risk. Previous researchers found that high school students who were Black were less likely to face psychological distress than their Caucasian peers, regardless of their socioeconomic status (Johnston, Bachman, & O’Malley,

1999). A potential buffer that was identified was church attendance, which may be also related to what Samaan (2000) referred to as the “communal buffering effect” (p. 108). Samaan (2000) also proposed that coming from a minority background and that individuals may face less mental health issues due to a protective factor, such as “extended families and perceived social support” (p. 100). The findings of the current study have suggested the need for a better understanding of why there were differences in reporting of mental health concerns emerged between races.

Fourth, early externalizing behavior and early school-related adjustment seemed to be important to later outcomes among youth. Externalizing behavioral concerns and early school-related adjustment were related to both academic and behavioral outcomes in eighth grade. This suggested that these are variables that can be used to identify youth in kindergarten who are at-risk for academic and behavioral concerns over time. In contrast, early internalizing behavior (parent and teacher-reported) had no significant relations to achievement in early adolescence. However, parent-reported internalizing behavior in kindergarten was associated with eighth grade behavioral outcomes across the board. This also suggested that early internalizing behaviors do not have the same connections within academics as they do on long-term behavioral outcomes. One underlying hypothesis for this difference may be that students can benefit from a certain threshold of stress academically as illustrated by the law of the Yerkes-Dodson curve, which was described above (Cohen, 2011; Luthar & Zigler, 1991). However, the potential for continuity of internalizing concerns over time, as well as the potential for these behaviors to also be related to externalizing symptoms, suggests that they should be monitored and in some cases be involved with early prevention and intervention efforts in order to prevent long-term behavioral vulnerability.

Fifth, interactions found in the current study suggest that gender moderated the relation between externalizing behavior and GPA in eighth grade. It also moderates the relationship between externalizing behavior and retention in eighth grade. The first interaction showed that although parent-reported externalizing behavior is a significant predictor of GPA across genders, males have greater odds of a lower GPA than girls if they have high levels of externalizing behavior. However, both males and females with externalizing behavior had a lower likelihood of making above a 2.0 for GPA in early adolescence compared to other children. This suggests the need for early intervention for children exhibiting externalizing behavior, as lower GPAs are associated with dropout and less favorable outcomes, such as incarceration and poverty (Archwamety & Katsiyannis, 2000; Malmgren & Leone, 2000; Tsai & Scomegna, 2012; Western & Petit, 2010). This is a particularly important consideration for males. With regard to the second interaction, males were more likely to be retained in general than females. However, females whom parents and teachers reported as having high levels of externalizing behavior were more likely to be retained than males overall. These findings suggest the need for early intervention among this subpopulation, as female students with extreme externalizing problems were more likely than males to experience retention by eighth grade. Much of the extant literature on externalizing behavior has focused on male students; the current study suggested a particularly strong need for intervention for girls with early high levels of externalizing behavior.

Sixth, the current study's findings have implications for what should be included on a kindergarten screener. Some of the most salient predictors of early adolescent outcomes were math skills, externalizing behaviors, internalizing behavior, and early school-related adjustment. Most of the kindergarten predictors identified were risk factors. Performance on standardized math assessment in kindergarten were positively related to eighth grade academic outcomes

(math and reading), while it was negatively related to lower mental health concerns (educational or mental health diagnosis, internalizing symptoms, and externalizing symptoms). Parent-reported externalizing behavior was more related to outcomes than teacher-reported externalizing behavior. Parent-reported externalizing behavior was only negatively associated with GPA, positively related to retention, and positively related to externalizing symptoms in eighth grade, Both parent-and teacher-reported externalizing behavior were negatively associated with reading, positively related to suspension, educational/mental health diagnosis and externalizing symptoms. Parent-reported internalizing behaviors was positively related to various behavioral outcomes (suspension, internalizing symptoms, and externalizing symptoms). School-related adjustment was positively connected to an academic outcome (reading) and negatively related to retention, while school-related emotional adjustment was negatively related to behavioral outcomes (internalizing and externalizing symptoms). Lastly, parent-reported prosocial behavior was only related to one behavioral outcome of internalizing symptoms; however, this can have important implications. As previously indicated if mental health issues emerge before the age of 14, there is greater likelihood of a long-term trajectory of these type of concerns (Kessler et al., 2005). Consequently, this finding suggests that it may be helpful to promote prosocial skills, as these students are associated with less internalizing concerns long-term. Overall, the current researcher would recommend including in a kindergarten screener math skills, externalizing behaviors, internalizing behavior, and early school-related adjustment.

Limitations

Although the current study expanded risk and resiliency research through using a longitudinal, national study, there were a few limitations of the current study should be considered. The first limitation was the current study was a correlational study, which means that directionality and causation cannot be determined (Glass & Hopkins, 1995). A second limitation

of the study was the study's archival nature, which prevented the researcher from being involved in determining the source of data (e.g., grades reported by parents). In terms of the second limitation, in future research it would be useful to have grades derived from the school records.

There are additional areas of study that could expand risk and resiliency research within the school setting. There are only a few research studies that examine differences among peers typically progressing in comparison to students who have been retained and those whose kindergarten entry has been delayed by a year, with the latter practice referred to as *redshirting* (Raffaele et al., 2014; Lincove & Painter, 2006). Raffaele Mendez and colleagues (2014) found in one large Florida district that retained students had worse achievement outcomes than students whose parents/guardian had delayed his or her child's entry by a year; however, these significant differences typically emerged among those with paid lunch status. In future research it would be interesting to explore these relations on a larger scale.

A third limitation of the current study was that internalizing problems were measured through symptoms only reported by parents, thereby excluding early adolescent self-report. Due to the relatively subtler nature of internalizing problems compared to externalizing problems, it would be helpful to also incorporate early adolescents' perspective into consideration with a national database (Merrell, 2008a).

A fourth limitation was that suspension in eighth grade were parent-reported and cumulative over the years from K-8. A retrospective recall may be less accurate than those if these were obtained from school records. In future research, it would be helpful for the data again to be derived from school record rather than parent report. Furthermore, ideally the data would be disaggregated by each year rather than a reported presence or absence of a suspension

over the extended time period of the current study (kindergarten through typically eighth grade), as many studies examine the frequency (typically over a year's or quarter's time.)

A fifth limitation is the lack of context. Although some systems information can be gathered from the ECLS-K, it became difficult within the current study to examine these differences. Since students are moving across settings from elementary into middle school, cross-classified models would be needed to examine different systems. However, the current researcher consulted with statistics expert, Dr. Dedrick, and he advised against this approach, as many cells would likely lack sufficient numbers. Also the study was quantitative and therefore there may have been missed opportunities for a mixed methods approach. For example, there could have been interviews of students in early adolescence of students who were successful in spite of an accumulation of risk factors for more in depth information.

A sixth limitation was the attrition rate. The sample began with over 21,400 students in kindergarten, whereas the current study included a longitudinal sample size ranging between 5,397– 6,009 students for the major research questions posed for outcomes during the 2006-2007 school when most students were in eighth grade. (The smallest sample size was for the math standardized test outcome, whereas the largest sample size was reported for presence or absence of special education status as of spring 2007.) Consequently, although the initial kindergarten sample was nationally representative, the current study's longitudinal sample from kindergarten through eighth grade was diverse but no longer nationally representative without weights being applied to offset. Without using the weights, the percent of the Caucasian population would have increased, while the percent of the Black and Hispanic population would have decreased and the SES composite would have increased. Unfortunately, the last limitation is a common concern for a longitudinal study. However, due to the large size of the sample, a large sample size was still

maintained across the current study's research questions and the weights also helped offset attrition as described within that section and as demonstrated in Table 1 and Appendix C.

Directions for Future Research

Overall the ECLS-K dataset contains various opportunities for future exploration within itself, while the fields of risk and resiliency, as well as developmental psychopathology, also have many possible future directions. It will be important in future research to obtain outcome data, such as suspension and GPA from school records, as there has been little literature to measure the accuracy of parent report, especially over such a long period of time in the former case.

In terms of the reporter of mental health symptoms, it would also be likely helpful to utilize adolescent self-report, as well as teacher report, in addition to parent report. Within the ECLS-K, there were items that could be derived from the early adolescent interview and would likely be able to be factored into an internalizing symptoms and externalizing symptoms composite. However, unfortunately, no teacher data related to mental health in early adolescence were available during middle school within the ECLS-K study, which may relate to the number of teachers that students have in middle school. A few research studies conducted during the 1990s suggested to some degree that there was cross-informant reliability on internalizing problems among early adolescents. However, Thomas and colleagues (1990) found that teachers reported internalizing problems were significantly lower than those reported by parent or adolescent. It was noteworthy that Thomas and colleagues (1990) had more agreement found among raters among early adolescents for internalizing concerns than externalizing concerns, which was the opposite of Achenbach and colleagues' (1987) findings on the same ASEBA scales and similar age range. Some limitations of the Thomas and colleagues' (1990) study were

a small sample size and that only anxiety and withdrawal were measured. In future research it would be helpful to also examine mental health outcomes through different reporters in attempt to determine vulnerable students. There is another future direction for mental health symptoms. It would be helpful to in future studies to examine externalizing concerns in terms of ADHD symptoms (e.g., hyperactivity, inattention, and impulsivity) versus aggressive tendencies (e.g., bullying, conduct issues, etc.). In the current study since the specific externalizing items used as predictors were not available due to copyright, the researcher kept the externalizing behavior as one cluster for the behavioral outcome in attempt to align with the predictor variable. Generally, the externalizing predictor consisted of five items, with two items examining impulsivity, and the overall measure included both ADHD symptoms and aggressive tendencies. Consequently, inattentive symptoms did not appear to be measured within the externalizing composite. The externalizing outcome cluster consisted of nine items about attention that were reverse coded, as well as inattention, temper, lying, and stealing. There have been inconsistent findings related to externalizing problems and academic performance (Duncan et al., 2007; Ensminger & Slusarcick, 1992; Hooper et al., 2010; Miles & Stipek, 2006), although the research generally has supported more relations between ADHD symptoms and academic performance (e.g., Bussing et al., 2010; Morgan et al., 2008; Wentzel, 1993). More research should be conducted to determine these relations over time with a full range of externalizing behaviors separately examined. Within the ECLS-K and also within the risk and resiliency field, it would be interesting to examine the role of retention versus redshirting in terms of outcomes. Huang (2015) highlighted previous research studies about redshirting prevalence rates, citing that Datar (2006) found that there were about 5-7% of ECLS-K students were redshirted. Notably, there are mixed findings in terms of the efficacy of the redshirting practice, with some studies highlighted its potential short-

term academic benefits (Datar, 2006), while other studies have associated it with long-term maladaptive behavioral outcomes. (e.g., substance abuse and behavioral concerns; Byrd, Weitzman, & Auinger, 1997; Byrd, Weitzman, & Doniger, 1996) and greater likelihood of having an Individualized Education Plan (IEP, which is when a student receives special education) than peers who were not redshirted (Raffaele Mendez et al., 2014). Further, research is needed to examine the outcomes of redshirting, retention, and typical grade progression.

Although the ECLS-K was an extremely ambitious undertaking, it may be helpful in future research to feature more of mixed studies approach. Although there were some brief fill in the blank questions, overall participants were limited often to multiple choice questions. By utilizing a mixed approach more contextual information can be surmised and additional themes can be gathered that may not captured by a pure, quantitative study.

Conclusion

The current study was ambitious as it aimed to examine which aspects of early childhood may predict academic and behavioral success and difficulties through early adolescence. Although the study did not focus on dropout, the study sought to examine risk and resiliency over time. There were various demographic variables, such as race/ethnicity, socioeconomic status, and gender that were frequent significant predictors of academic and behavioral outcomes. The present study found that early math assessment was often related to both academic and behavioral outcomes, which suggested the need for schools to further expand their research of evidence-based practice and early intervention in math.

Several significant early behavioral risk factors were found in relation to academic outcomes and behavioral outcomes. Parent-and teacher-reported externalizing behaviors were negatively related to long-term standardized reading scores, while parent-reported externalizing

behavior was positively associated with retention in eighth grade. These results were important as they suggested relations between early mental health and long-term academic performance. Parent-reported early internalizing behaviors and externalizing behavior across raters suggested continuity from early childhood and into early adolescence. Moreover, parent-reported internalizing behavior predicted externalizing symptoms, while conversely, parent-reported externalizing behavior predicted internalizing symptoms. This suggested the presence of equifinality as students with different early risk factors had similar outcomes over time (Cicchetti & Rogosh, 1996).

Within the current study, resiliency factors were less commonly found to be related to outcomes than risk factors. Prosocial behavior did not appear as a significant promotive factor, with the exception of showing a relation with lower levels of early adolescent internalizing behavior. However, early school-related emotional adjustment, which focused on parent-reported transition rather than completely on the parent-teacher relationship, was a promising promotive factor. Early school-related adjustment predicted adjustment in several early adolescent academic and behavioral outcomes, including math performance, retention, internalizing symptoms, and externalizing symptoms.

Overall, findings of this study suggest that early math skills, externalizing behaviors, internalizing behaviors, and early school-related adjustment were particularly important to school-related outcomes in early adolescence. These skills and behaviors should be measured among all students in kindergarten, with students who are struggling in these areas receiving additional services to promote improvement in order to facilitate long-term adjustment. Additionally, this study has shown that youth who are retained in kindergarten tended to remain behind their typically progressing peers. Retention had negative associations with both academic

and behavioral outcomes in eighth grade. It is hoped that the results of this study will be used to inform the content of screeners in early childhood with a focus on promoting better outcomes for youth over time.

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APPENDICES

Appendix A: Review of Selection of Relevant Early Childhood Longitudinal Study-Kindergarten (ECLS-K) Articles

Table A1

Review of a Selection of Relevant Early Childhood Longitudinal Studies-Kindergarten (ECLS-K) Articles

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Academic and Behavioral Variables in Relation to Academic Outcomes						
<p>Duncan et al. (2007): Published peer reviewed article.</p> <p>Predictors: School readiness (academic, attention, and socio-emotional skills).</p> <p>Control: socio-demographic variables (e.g., SES, gender).</p> <p>Outcomes: Reading and math achievement (for ECLS-K until 3rd grade).</p>	<p>Secondary Analysis of Questionnaires: Meta-Analysis.</p>	<p>6 datasets, including ECLS-K.</p>	<p>Examine school readiness in relation to reading and math success over time.</p>	<p>1) Across the 6 data sets, early math skills were the most predictive of later achievement (reading and math).</p> <p>2) In several studies, socio-emotional behaviors (including internalizing and externalizing concerns) were not significant predictors of later achievement.</p> <p>3) Found similar trends across gender and SES groups.</p>	<ul style="list-style-type: none"> • ECLS-K achievement outcomes only measured until 3rd grade. • Behavioral outcomes were omitted. 	<ul style="list-style-type: none"> • Examine academic outcomes into middle school for the ECLS-K study. • For a more holistic analysis of the cohort than academic success also include behavioral outcomes in eighth grade.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Academic and Behavioral Variables in Relation to Academic Outcomes						
<p>Bodovski, & Youn (2011): Published peer reviewed article.</p> <p>Predictors: behaviors, including Prosocial behavior, Approaches to Learning, internalizing and externalizing problems in first grade.</p> <p>Control: 1st grade academic achievement; Socio-demographic variables (e.g., SES, gender, race).</p> <p>Outcomes: Reading and math achievement (ECLS-K fifth grade).</p>	<p>Secondary Analysis of Questionnaires: Regression.</p>	<p>Longitudinal sample for ECLS-K (N = 7,635).</p>	<p>Examine academic and behavioral variables in relation to late elementary school performance.</p>	<p>1) An aspect of behavior (i.e., Approaches to Learning (ATL) was associated with academic achievement in 5th grade as measured by IRT scores.</p> <p>2) An interaction was detected, in which students with high levels of ATL from low SES backgrounds, female (in the case of math), or minority students had high test scores in fifth grade.</p> <p>3) Math and reading performance in 1st grade significantly predicted Approaches to Learning.</p>	<ul style="list-style-type: none"> • Academic skills measured during first grade rather than upon school entry. • ECLS-K achievement outcomes and behavioral outcome only measured until 5th grade. 	<p>1) Examine academic skills upon school entry.</p> <p>2) Examine academic and behavioral outcomes into middle school.</p>

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Academic and Behavioral Variables in Relation to Academic Outcomes						
<p>Bodovski & Youn (2012): Published peer reviewed article.</p> <p>Predictors: School readiness (math and reading scores and Approaches to Learning)</p> <p>Control: socio-demographic variables (e.g., SES, race, gender).</p> <p>Outcomes: Math achievement in first, third, fifth, and eighth grade (i.e., IRT Scale Score; taking Advanced Math of Algebra or above in eighth grade).</p>	<p>Secondary Analysis of Questionnaires: Growth Model.</p>	<p>Longitudinal sample for ECLS-K ($N = 12,256$).</p>	<p>Examine school readiness (IRT score) in relation to math success over time (i.e., into middle school).</p>	<p>1) School readiness was positively related to math achievement in each grade.</p> <p>2) No significant interactions found among school readiness and socio-demographic variables (gender, race, and SES) in relation to math academic outcomes.</p>	<ul style="list-style-type: none"> • Omitted teacher (ARS), which may have resulted in less available data for English Language Learners (ELLs) who may have been excluded from reading test if English proficiency score below the cut-off score. • Omitted grades for consideration of achievement in eighth grade. • Excluded parental input on early behavioral variables. • Omitted behavioral outcomes (e.g., suspensions). 	<ul style="list-style-type: none"> • Include ARS to provide more information on ELLs. • Include grades for achievement in eighth grade. • Also provide parental input on early behavioral variables. • For a more holistic analysis of the cohort than academic success also include behavioral outcomes in eighth grade.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Behavioral Factors in Relation to Academic Outcomes						
<p>Claessens & Engel (2013): Published peer reviewed article.</p> <p>Predictors: Item Response Theory (IRT) Scores in reading and math upon school entry (kindergarten), and general knowledge; Control: gender, race/ethnicity, home language, as well as early health factors, etc.</p> <p>Outcomes: Math, reading, and science skills in eighth grade; Academic Rating Scale (ARS) in reading/math and retentions.</p>	<p>Secondary Analysis of Questionnaires: Regression.</p>	<p>Longitudinal sample for ECLS-K ($N = 7,655$).</p>	<p>Examine early math achievement (proficiency probability IRT) in relation to achievement over time (i.e., into middle school), especially in math, reading, and science.</p>	<p>1) School entry math IRT success probability scores better predictor of later achievement in reading and math in eighth grade than early reading IRT probability scores.</p> <p>2) Across socio-demographic groups, math achievement upon school entry was found to be an important predictor of later achievement in eighth grade.</p>	<ul style="list-style-type: none"> • Predictors and outcomes were limited to academic success measures and excluded other variables (e.g., early behavior). 	<ul style="list-style-type: none"> • Include early behavioral variables as predictors and outcomes.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Behavioral Factors in Relation to Academic Outcomes						
<p>Hooper, Roberts, Sideris, Burchinal, M., & Zeisel, (2010): Published peer reviewed article.</p> <p>Predictors: internalizing problems, externalizing problems (i.e., aggressive behaviors and inattention), and prosocial behavior in Kindergarten.</p> <p>Outcomes: Reading and math skills in eighth grade.</p>	<p>Secondary Analysis of Questionnaires.</p>	<p>2 samples: 1) Child Health & Human Development t's Study of Child Care and Youth Development (SECCYD) and 2) ECLS-K Longitudinal sample for ECLS-K (N = 12,206).</p>	<p>Examine early social-behavioral as predictors of reading and math skills in terms of change over time (i.e., into middle school).</p>	<p>1) ECLS-K dataset: a) Moderating effect: weak but significant of early ratings of aggressive behaviors & internalizing behaviors on middle school reading and math among Black students. b) Moderating effect: when high internalizing behavior scores then faster academic growth among these Black students than Black students with low levels of internalizing behaviors. c) High attention ratings and high internalizing scores then better math scores (i.e. IRT scores) later.</p> <p>2) SECCYD: early behavioral variables were <u>not</u> significant predictors of reading growth or math.</p>	<ul style="list-style-type: none"> • Only used Black and Caucasian sample. • Only used teacher-reported data in kindergarten. 	<ul style="list-style-type: none"> • Determine whether within child variables determine behavioral outcomes, such as later suspensions. • Also utilize parent-reported early behavioral data.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Behavioral Variables in Relation to Academic and Social Outcomes						
<p>Hair, Halle, Terry-Humen Lavelle, & Calkin (2006): Published peer-reviewed article.</p> <p>Predictors: Social/emotional strengths or weaknesses, etc. in Kindergarten.</p> <p>Outcomes: academic, health, and social functioning in 1st grade.</p>	<p>2 studies within: 1) Cluster Analyses 2) Kindergarten Profiles in comparison to 1st grade outcomes (also consider family background characteristics.</p> <p>Person-Center analytic approach.</p> <p>Analysis: Generalized Linear Modeling.</p>	<p>ECLS-K 1) 1st time kindergarten students ($N = 17,219$). • Those with a school readiness profile and valid longitudinal sampling weights ($N = 13,397$).</p>	<p>School readiness relating to academic social, and health, outcomes.</p>	<p>Study 1:</p> <ul style="list-style-type: none"> • at kindergarten entry 4 profiles: (1) comprehensive positive development (30%), (2) social/emotional and health strengths (34%), (3) social/emotional risk (13%), and (4) health risk (22.5% of the sample). <p>Study 2:</p> <ul style="list-style-type: none"> • 1 of 2 “profiles” more likely from family background with SES disadvantages • Children with a risk profile performed the worst on all outcomes. • Children with a comprehensive positive development profile performed the best. • Social/emotional risk profile: <ul style="list-style-type: none"> ○ low math & reading assessment scores. ○ low on self-control & works to their best ability. 	<ul style="list-style-type: none"> • Exclusion of repeating kindergarten students. • Short-term longitudinal. 	<ul style="list-style-type: none"> • Inclusion of repeating kindergarten students. • Explore long-term outcomes.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Behavioral Variables in Relation to Academic and Behavioral Outcomes						
<p>Wright et al. (2014): Published peer-reviewed article.</p> <p>Predictors: Sum of prior problem behavior (lack of self-control, prosocial behavior, attention; & externalizing bx) “delinquency” construct in round 7; overall GPA; School characteristics: (free or reduced lunch; school size) Control: Socio-demographic (e.g., race, gender, SES by parental education & poverty); IEP status.</p> <hr/> <p>Outcome: suspension history</p>	<p>Logistic regression analysis.</p>	<p>Caucasian and Black students included ($N = 2,737$).</p> <p>Only included public schools.</p>	<p>1) Examine potential confounding variables that account for suspension rate differences among groups of students (e.g., race/ethnicity-wise).</p>	<ul style="list-style-type: none"> • Results suggest that previous problem behavior accounts for the differences between Black and Caucasian students. 	<ul style="list-style-type: none"> • Excluded private school students and other racial/ethnic groups. • Previous problem behavior can also be considered subjective. • Combines an average of problem behaviors over time. 	<ul style="list-style-type: none"> • Include private school students and other ethnic groups. • In attempt to reduce some biases, include additional sources of data (e.g., parent) to determine if consistency of behavior across raters. • To use one time point of behavior upon kindergarten entry when screenings commonly conducted.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Early Behavioral Variables in Relation to Academic and Behavioral Outcomes						
<p>Mills (2007): Dissertation (Proquest).</p> <p>Predictors: Presence or absence of Learning Disability; Control: socio-demographic (e.g., SES based on income).</p> <p>Outcomes: Social emotional competence (measured via social skills); also progress in prosocial behavior over time.</p>	<p>Analysis: latent growth curve.</p>	<p>ECLS-K public-use data file K-5th students with Learning Disabilities (N= 8,095 participants).</p> <ul style="list-style-type: none"> • Excluded ELLs, hearing and/or vision difficulties. • Measured prosocial behavior in spring of Kindergarten, first, third, and fifth grade. 	<p>1) To examine how students with reading difficulties, and/or math difficulties compare to kids without learning difficulties.</p>	<p>1) If experienced <u>later difficulties in BOTH reading and math, consistently lowest ratings of prosocial behavior by teachers in Kindergarten.</u></p> <p>2) but if trouble in only of these subjects then less consistent prosocial behavior ratings from Kindergarten.</p> <p>3) No differences in growth trajectories of kids' prosocial behavior from K-5th grade for children later identified with different subtypes of learning difficulties.</p>	<ul style="list-style-type: none"> • Not peer-reviewed. • Extent of attrition. • Excludes outliers in public database. 	<ul style="list-style-type: none"> • Prosocial behavior <u>not</u> measured in the Fall of Kindergarten. • Only teachers rate perceptions of a student's prosocial behavior (i.e., excludes parent ratings). • Consideration of behavioral outcome (i.e., prosocial behavior over time) but omits middle school behavioral data (e.g., suspensions).

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Academic and Behavioral Variables in Relation to Academic Outcomes						
<p>DiPerna, Lei, & Reid, (2007): Published peer-reviewed article.</p> <p>Predictors: Approaches to Learning (i.e., measure of attention), prosocial behavior; internalizing problems, externalizing problems upon kindergarten entry.</p> <p>Outcomes: mathematical growth to 3rd grade</p>	Growth Model	<p>ECLS-K (N = 6,905).</p> <ul style="list-style-type: none"> Excluded repeating kindergarten students, students with language accommodations, or students who transferred schools. 	<p>1) Explore math trajectories in relation to:</p> <p>a) Attention and prosocial behavior upon kindergarten entry.</p> <p>b) Behavior problems (internalizing and externalizing).</p>	<p>1) No significant relation was found between problematic behaviors upon kindergarten entry and mathematic achievement.</p> <p>2) Prosocial behavior had a small negative relation with mathematic growth.</p> <p>3) Approaches to Learning had a small positive association with mathematic growth.</p>	<ul style="list-style-type: none"> Omitted examination across different demographic groups (e.g., family SES). Exclusion criteria (see Participant Information). Used only teacher ratings of behavior. 	<ul style="list-style-type: none"> Examine potential differences across socio-demographic groups. Incorporate parent perspective of student behavior.

1) Reference and Type 2) Construct(s)	Methods	Participant Information	Main Aims, Major Hypotheses, and/or Research Questions	Key Findings	Limitations	Implications/ Future Directions
Academic and Behavioral Variables as Predictors and Outcomes Simultaneously						
<p>Morgan, Farkas, Tufis, & Sperling (2008): Published peer-reviewed article.</p> <p>Constructs: Predictors: Academic performance in 1st grade reading; control: socio-demographic variables (gender, race/ethnicity, poverty, family structure; school location)</p> <p>Outcomes: 3rd grade reading; 3rd grade behavior (self-control; task engagement; externalizing problems; internalizing problems)</p>	<p>Multilevel Logistic Regression.</p> <ul style="list-style-type: none"> • “Problem” identified as 10% cutoff at the “worst” end of their distribution in 1st and 3rd grades. 	<p>ECLS-K dataset ($N = 11,515$) students attending public and private elementary schools.</p>	<p>1) Are children with reading problems in first grade more likely to experience behavior problems in 3rd grade?</p> <p>2) Are children with behavior problems in first grade more likely to experience reading problems in 3rd grade?</p>	<p>1) After controlling for confounds (e.g., gender, race/ethnicity, language spoken at home), children with reading problems in 1st grade were significantly more likely to experience behavioral concerns in 3rd grade (e.g., poor self-control, poor task engagement, externalizing problems; internalizing problems).</p> <p>2) Students with poor task engagement in 1st grade were more likely to experience reading problems in 3rd grade.</p>	<ul style="list-style-type: none"> • Initial behavioral assessment during 1st grade. • Short-term Longitudinal. • Excluded students who transferred schools due to HLM nesting assumptions. • Only examined reading academic performance. 	<ul style="list-style-type: none"> • Examine students on constructs during kindergarten entry. • Assess relations from elementary into secondary school. • Examine math performance as a predictor and an outcome.

Appendix B: University of South Florida Institutional Review Board Exemption



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

October 29, 2013

Linda Raffaele Mendez, Ph.D.
Psychological and Social Foundations
4202 E. Fowler Avenue, EDU 162
Tampa, FL 33612

RE: NOT Human Research Activities Determination

IRB#: Pro00014759

Title: Risk and Protective Behavioral Factors at School Entry: Relations to Outcomes in Early Adolescence

Dear Dr. Raffaele Mendez:

The Institutional Review Board (IRB) has reviewed the information you provided regarding the above referenced project and has determined the activities do not meet the definition of human subjects research. Therefore, IRB approval is not required. If, in the future, you change this activity such that it becomes human subjects research, IRB approval will be required. If you wish to obtain a determination about whether the activity, with the proposed changes, will be human subjects research, please contact the IRB for further guidance.

All research activities, regardless of the level of IRB oversight, must be conducted in a manner that is consistent with the ethical principles of your profession and the ethical guidelines for the protection of human subjects. As principal investigator, it is your responsibility to ensure subjects' rights and welfare are protected during the execution of this project.

Also, please note that there may be requirements under the HIPAA Privacy Rule that apply to the information/data you will use in your activities. For further information about any existing HIPAA requirements for this project, please contact a HIPAA Program administrator at 813-974-5638.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in black ink, appearing to read "Kristen Salomon", written over a light gray rectangular background.

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board

Appendix C: Attrition

Table C1

Frequency Distribution for Unweighted versus Weighted

Predictor	Unweighted Kindergarten (ID only; observations = 21,409)	Unweighted Kindergarten (parent interview in K and math score in K (Observations = 17,171)	Unweighted Eighth Grade (parent interview in K and math score in K, observations = 6,242)	Weight by C1CW0 ^a (Fall Kindergarten Cross Sectional, observations = 6,671)	Weight by C2CW0 ^b (Spring Kindergarten Cross Sectional, observations = 6,686)	Weight by C7CW0 ^c (Eighth Grade Cross-Sectional, observations = 6,513)	Weight by C1_7FP0 ^d (Eighth Grade Longitudinal, observations = 6,751)
Control							
Demographics							
Gender							
Male	10,950	8,703	3,536	1,982,811	1,996,259	2,058,788	1,992,193
Female	10,446	8,468	3,515	1,879,602	1,863,710	1,885,039	1,848,592
Race/ethnicity							
Caucasian	11,788	9,944	4,617	2,193,032	2,190,259	2,243,441	2,204,889
Black, non-Hispanic	3,224	2,509	646	613,438	640,716	678,203	654,197
Hispanic	3,826	3,034	1,170	747,127	731,351	726,619	
Asian, non-Hispanic	1,366	713	254	3,749,402	115,661	116,117	115,610
Native American	605	473	192	90,880	87,123	89,266	89,119
Multi	549	483	168	93,887	88,764	80,340	80,613
1 st time kindergarten	17,219	16,382	6,785	3,395,860	3,168,196	3,103,685	3,665,819

Note. K is kindergarten. Unweighted Fall Kindergarten is when no weight, strata, or cluster have been applied and the student only needed to have a Child ID.

^aC1CW0 is a cross-sectional weight including “fall-kindergarten parent interview data, alone or in combination with child assessment data”.

^bC2CW0 is a cross-sectional weight including “spring-kindergarten parent interview data, alone or in combination with child assessment data.”

^cC7CW0 is a cross-sectional weight including “child direct assessment or student questionnaire data from spring-eighth grade, alone or in combination with (a) a limited set of child characteristics (e.g., age, sex, and race/ethnicity), (b) data from any spring-eighth grade teacher questionnaire (teacher level or child-level), or (c) data from the spring-eighth grade school administrator questionnaire.” This sample includes the freshened sample of first grade students.

^dC1_7FP0 is a longitudinal weight including “parent interview data from six rounds of data collection (fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, and spring-eighth grade), alone or in combination with (a) child assessment data from these any of these six rounds, (b) data from any fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade teacher questionnaire (teacher-level or child-level), (c) data from any spring kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade school administrator questionnaire, or (d) data from any spring-kindergarten, spring-first grade, spring-third grade, or spring-fifth grade school facilities checklist.”

Table C2

Percentage of Distribution for Unweighted versus Weighted Data

	Unweighted Kindergarten (ID only; observations = 21,409)	Unweighted Kindergarten (parent interview in K and math score in K (Observations = 17,171)	Unweighted Eighth Grade (parent interview in K and 8 th Grade and math score in K, observations = 6,242)	Weight by C1CW0 ^a (Fall Kindergarten Cross Sectional, observations = 6,671)	Weight by C2CW0 ^b (Spring Kindergarten Cross Sectional, observations = 6,686)	Weight by C7CW0 ^c (Eighth Grade Cross-Sectional, observations = 6,513)	Weight by C1_7FP0 ^d (Eighth Grade Longitudinal, observations = 6,751)
Predictors							
Control Demographic Variable							
Gender							
Male	51.18	50.68	50.15	51.34	51.72	52.20	51.87
Female	48.82	49.32	49.85	48.66	48.28	47.80	48.13
Race/ethnicity							
Caucasian	55.19	57.96	65.52	56.89	56.83	57.03	57.44
Black, non-Hispanic	15.06	14.61	9.16	15.87	16.58	17.20	17.03
Hispanic	17.87	17.67	16.59	19.33	18.93	18.42	18.08
Asian, non-Hispanic	6.38	4.15	3.60	3.01	2.99	2.94	3.01
Native American	2.83	2.75	2.72	2.35	2.26	2.26	2.32
Multi	2.56	2.81	2.38	2.43	2.30	2.04	2.10
1 st Time kindergarten	95.30	95.44	96.24	95.42	95.24	95.18	95.51

Note. K is kindergarten. Unweighted Fall Kindergarten is when no weight, strata, or cluster have been applied and the student only needed to have a Child ID.

^aC1CW0 is a cross-sectional weight including “fall-kindergarten parent interview data, alone or in combination with child assessment data”.

^bC2CW0 is a cross-sectional weight including “spring-kindergarten parent interview data, alone or in combination with child assessment data.”

^cC7CW0 is a cross-sectional weight including “child direct assessment or student questionnaire data from spring-eighth grade, alone or in combination with (a) a limited set of child characteristics (e.g., age, sex, and race/ethnicity), (b) data from any spring-eighth grade teacher questionnaire (teacher level or child-level), or (c) data from the spring-eighth grade school administrator questionnaire.” This sample includes the freshened sample of first grade students.

^dC1_7FP0 is a longitudinal weight including “parent interview data from six rounds of data collection (fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, and spring-eighth grade), alone or in combination with (a) child assessment data from these any of these six rounds, (b) data from any fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade teacher questionnaire (teacher-level or child-level), (c) data from any spring kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade school administrator questionnaire, or (d) data from any spring-kindergarten, spring-first grade, spring-third grade, or spring-fifth grade school facilities checklist.”

Table C3

Mean for Unweighted versus Weighted Data

Predictor	Unweighted						
	Unweighted Kindergarten Fall Kindergarten observation (ID only; ns = 21,409)	Unweighted parent interview in K and math score in K (Observatio ns = 17,171)	Unweighted Eighth Grade parent interview in K and 8 th Grade and math score in K, observations = 6,242)	Weight by C1CW0 ^a (Fall Kindergart en Cross Sectional, observatio ns = 6,671)	Weight by C2CW0 ^b (Spring Kindergar ten Cross Sectional, observatio ns = 6,686)	Weight by C7CW0 ^c (Eighth Grade Cross- Sectional, observatio ns = 6,513)	Weight by C1_7FP0 ^d (Eighth Grade Longitudina l, observations = 6,751)
Control							
Demographic							
SES	.01	.18	.20	.14	.13	.11	.03
Early Academic Variables							
Reading k Assessment	35.21	36.76	36.85	36.31	36.27	36.11	35.60
Reading Academic Rating Scale	3.37	3.49	3.50	3.47	3.64	3.44	3.41
Math k Assessment	25.91	27.85	27.99	27.44	27.42	27.01	26.44
Math ARS	3.54	3.67	3.68	3.64	3.64	3.62	3.59
Combined ARS	3.46	3.58	3.59	3.55	3.55	3.54	3.51
Early resiliency behavior (bx)							
Early school-related emotional adjustment	2.76	2.77	2.77	2.77	2.77	2.77	2.77
Prosocial behavior (parent-reported)	3.31	3.35	3.35	3.34	3.34	3.33	3.32
Prosocial behavior (teacher-reported)	2.96	3.05	3.06	3.05	3.04	3.00	3.00
Early risk behavior (bx)							
Int bx (parent-Reported)	1.55	1.53	1.53	1.53	1.53	1.54	1.55
Int bx (teacher-Reported)	1.55	1.49	1.49	1.50	1.50	1.52	1.52
Ext bx (parent-reported)	1.97	1.89	1.89	1.91	1.91	1.96	1.97
Ext bx (Teacher-Reported)	1.63	1.56	1.55	1.57	1.57	1.61	1.63

Note. K is kindergarten. Unweighted Fall Kindergarten is when no weight, strata, or cluster have been applied and the student only needed to have a Child ID.

^aC1CW0 is a cross-sectional weight including “fall-kindergarten parent interview data, alone or in combination with child assessment data”.

^bC2CW0 is a cross-sectional weight including “spring-kindergarten parent interview data, alone or in combination with child assessment data.”

^cC7CW0 is a cross-sectional weight including “child direct assessment or student questionnaire data from spring-eighth grade, alone or in combination with (a) a limited set of child characteristics (e.g., age, sex, and race/ethnicity), (b) data from any spring-eighth grade teacher questionnaire (teacher level or child-level), or (c) data from the spring-eighth grade school administrator questionnaire.” This sample includes the freshened sample of first grade students.

^dC1_7FP0 is a longitudinal weight including “parent interview data from six rounds of data collection (fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, and spring-eighth grade), alone or in combination with (a) child assessment data from these any of these six rounds, (b) data from any fall-kindergarten, spring-kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade teacher questionnaire (teacher-level or child-level), (c) data from any spring kindergarten, spring-first grade, spring-third grade, spring-fifth grade, or spring-eighth grade school administrator questionnaire, or (d) data from any spring-kindergarten, spring-first grade, spring-third grade, or spring-fifth grade school facilities checklist.”

Appendix D: Reading Achievement Tables

Table D1

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Reading Achievement Score Demographics and Early Academic Variations (N = 5,489-6,431)

Predictor	Model 1: Demographics (N = 6,431)		Model 2: Early academics (N = 5,752)		Model 3: Demographics and early academics (N = 5,752)		Model 4: Early academics and early resiliency behavior (N = 5,489)		Model 5: Early academics and early risk behavior **** (N = 5,539)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	175.35	.75	97.93	3.89	118.02	3.42	88.65	7.37	120.78	5.41
Control										
Demographics										
Gender (1 = M; 0 = F)	-6.53***	.99			-4.58***	.92				
SES composite	13.63**	.69			7.31***	.67				
Asian ^a (Y= 1, N = 0)	1.10	2.16			0.01	2.13				
Black ^a (Y= 1, N = 0)	-	2.02			-13.46***	1.94				
	16.17**	*								
Hispanic ^a (Y= 1, N = 0)	-6.21***	1.46			.60	1.36				
Native American ^a (Y= 1, N = 0)	-6.03	4.26			-2.27	2.95				
Multi ^a (Y= 1, N = 0)	-2.71	2.29			-1.33	2.25				
Early academic performance										
1 st time kindergarten****			10.36***		8.55***	2.25	9.22***	2.27	8.33**	2.34
Reading Assessment			.33***		.21**	.06	.33***	.06	.29***	.07
Combo ARS			6.71***		5.82***	.80	5.36***	1.06	5.47***	.99
Math Assessment			1.00***		.73***	.07	.99***	.08	.96***	.08
Early resiliency behavior (bx)										
Early school-related emotional adaptation							2.21	2.33		
Prosocial bx (parent- reported)							-.27	1.04		
Prosocial bx (teacher- reported)							3.32**	.99		
Early risk behavior (bx)										
Int bx (parent-reported)									2.04	1.54
Int bx (teacher-reported)									-1.38	1.19
Ext bx (parent-Reported)									-4.70***	.99
Ext bx (teacher-reported)									-3.76**	1.05
F Value	135.70*		173.42***		103.07***		103.58***		117.37**	
	**								*	
R ²	.27		.31		.40		.32		.33	
Δ R ²			.04		-.09		-.08		.01	

Note. **p* < .05. ***p* < .01. ****p* < .001. Int = Internalizing.

Bx = Behavior. **** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table D2

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Reading Achievement Score Demographics and Early Resiliency Behavior Variations (N = 5,489-6,431)

Predictor	Model 1: Demographics (N = 6,431)		Model 6: Early Resiliency Behavior (N = 6,052)		Model 7: Demographics and Early Resiliency Behavior (N = 6,052)		Model 4: Early Resiliency Behavior and Early Academics (N = 5,489)		Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 5,902)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	175.35	.75	113.70	8.36	141.17	6.51	88.65	7.37	148.70	10.76
Control										
Demographics										
Gender (1 = M; 0 = F)	-6.53***	.99			-4.48***	.99				
SES composite	13.63***	.69			13.01***	.74				
Asian ^a (Y= 1, N = 0)	1.10	2.16			1.16	2.09				
Black ^a (Y= 1, N = 0)	-16.17***	2.02			-15.12***	1.98				
Hispanic ^a (Y= 1, N = 0)	-6.21***	1.46			-5.82***	1.38				
Native American ^a (Y= 1, N = 0)	-6.03	4.26			-5.41	3.79				
Multi ^a (Y= 1, N = 0)	-2.71	2.29			-2.37	2.45				
Early academic performance										
1 st time kindergarten****							9.22***	2.27		
Reading asmt							.33***	.06		
Combo ARS							5.36***	1.06		
Math asmt							.99***	.08		
Early resiliency behavior (bx)										
Early school-related emotional adaptation			5.02	2.69	4.70*	2.29	2.21	2.33	3.34	2.80
Prosocial bx (parent-reported)			3.82**	1.26	1.00	1.11	-.27	1.04	4.50**	1.35
Prosocial bx (teacher-reported)			9.57***	1.06	5.54***	.92	3.32**	.99	5.49***	1.27
Early risk behavior (bx)										
Int bx (parent-Reported)									3.30	1.82
Int bx (teacher-reported)									-4.47**	1.53
Ext bx (parent-reported)									-7.12***	1.10
Ext bx (teacher-reported)									-2.80*	1.32
F Value	135.70***		35.38***		92.88***		103.58***		28.64***	
R ²	.27		.06		.29		.32		.10	
Δ R ²			-.21		.23		.03		.22	

Note. *p < .05. **p < .01. *** <.001.

Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table D3

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Reading Achievement Score Demographics and Externalizing Behavior Variations (N = 5,489-6,431)

Predictor	Model 1: Demographics (N = 6,431)		Model 9: Early Risk Behavior (N = 6,123)		Model 10: Demographics and Early Risk Behavior (N = 6,123)		Model 5: Early Academics and Early Risk Behavior (N = 5,539)		Model 8: Prosocial and Early Risk Behavior (N = 5,902)	
	B	SE B	B	B	B	SE B	B	SE B	B	SE B
Intercept	175.35	.75	199.79	3.07	196.20	2.82	120.78	5.41	148.70	10.76
Control										
Demographics										
Gender (1 = M; 0 = F)	-6.53***	.99			-4.78***	.98				
SES composite	13.63***	.69			12.73***	.80				
Asian ^a (Y= 1, N = 0)	1.10	2.16			-.20	2.23				
Black ^a (Y= 1, N = 0)	-16.17***	2.02			-14.92***	1.82				
Hispanic ^a (Y= 1, N = 0)	-6.21***	1.46			-7.04***	1.39				
Native American ^a (Y= 1, N = 0)	-6.03	4.26			-5.21	4.17				
Multi ^a (Y= 1, N = 0)	-2.71	2.29			-.61	2.51				
Early academic performance										
1 st time kindergarten****							8.33**	2.34		
Reading Assessment							.29***	.07		
Combo ARS							5.47***	.99		
Math \assessment							.96***	.08		
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation									3.34	2.80
Prosocial bx (Parent-Reported)									4.50**	1.35
Prosocial bx (Teacher-Reported)									5.49***	1.27
Early Risk Behavior (bx)										
Int bx (Parent-Reported)			1.58	1.71	-.85	1.46	2.04	1.54	3.30	1.82
Int bx (Teacher-Reported)			-6.38***	1.32	-5.02***	1.13	-1.38	1.19	-4.47**	1.53
Ext bx (Parent-Reported)			-7.45***	1.10	-3.52**	.93	-4.70***	.99	-7.12***	1.10
Ext bx (Teacher-Reported)			-5.47***	1.25	-3.59***	1.07	-3.76***	1.05	-2.80*	1.32
F Value	135.70***		41.65***		121.34***		117.37***		28.64***	
R ²	.27		.08		.30		.33		.10	
Δ R ²			-.19		.22		.03		-.23	

Note. *p < .05. **p < .01. *** < .001.

Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table D4

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Reading Achievement Score of Final and Non-Significant Interactions (N = 5,365)

Predictor	Model 11: All main effects (N = 5,365)		Model 12: Interaction of parent-reported Impulsivity x Gender: <i>N.S.</i> (N = 5,365)		Model 13: Interaction of teacher- reported externalizing x gender: <i>N.S.</i> (N = 5,365)	
	B	SE B	B	SE B	B	SE B
Intercept	133.31	7.79	130.87	8.14	132.14	8.06
Control						
Demographics						
Gender (1 = M; 0 = F)	-3.29**	1.00	.46	3.37	-1.76	2.85
SES composite	7.07***	.77	7.07***	.76	7.06***	.77
Asian ^a (Y= 1, N = 0)	-1.39	2.01	-1.33	2.00	-1.34	2.01
Black ^a (Y= 1, N = 0)	-12.39***	1.83	-12.48***	1.80	-12.44***	1.81
Hispanic ^a (Y= 1, N = 0)	-.12	1.32	-.05	1.32	-.10	1.31
Native American ^a (Y= 1, N = 0)	-2.98	3.46	-2.95	3.44	-2.98	3.47
Multi ^a (Y= 1, N = 0)	-.97	2.45	-1.01	2.48	-.98	2.43
Early academic performance						
1 st time kindergarten****	6.48**	2.09	6.45**	2.10	6.45**	2.12
Reading assessment	.20***	.06	.20***	.06	.20***	.06
Combo ARS	4.90***	.87	4.90***	.86	4.90***	.87
Math assessment	.73***	.07			.73***	.08
Early resiliency behavior (bx)						
Early school-related emotional adaptation	2.02	2.28	2.00	2.26	2.01	2.27
Prosocial bx (parent-reported)	-.75	1.01	-.69	1.00	-.73	1.00
Prosocial bx (teacher-reported)	-.57	1.06	-.55	1.07	-.52	1.07
Early risk behavior (bx)						
Int bx (parent-reported)	.42	1.46	.43	1.45	.43	1.46
Int bx (teacher-reported)	-1.76	1.06	-1.70	1.05	-1.71	1.04
Ext bx (parent-reported)	-2.53**	.90	-1.39	1.45	-2.52**	.90
Ext bx (teacher-reported)	-2.79*	1.09	-2.76*	1.09	-2.17	1.68
Interactions block						
Gender x ext bx (parent-reported)			-1.92	1.80	-.96	1.83
Gender x ext bx (teacher-reported)						
F Value	74.24***		73.89***		75.90***	
R ²	.41		.41		.41	
Δ R ²			N/A		N/A	

Note. **p* < .05. ***p* < .01. *** < .001. **** Model 11 was the final model determined by significant variables, because of the tested interactions, neither was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NPIMPUL = Not Significant in Model 12 and NGender*NTIEXTERN = Not Significant in Model 13) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix E: Math Achievement Tables

Table E1

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Math Achievement Score Demographics and Early Academic Variations (N = 5,522 -6,472)

Predictor	Model 1: Demographics (N = 6,472)		Model 2: Early Academics (N = 5,788)		Model 3: Demographics and Early Academics (N= 5,788)		Model 4: Early Academics and Early Resiliency Behavior (N = 5,522)		Model 5: Early Academics and Early Risk Behavior (N = 5,574) ****	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	142.42	.76	81.06	3.81	89.44	3.67	70.81	5.82	92.24	4.93
Control										
Demographics										
Gender (1 = M; 0 = F)	.91	.77			2.42**	.77				
SES composite	10.59	.58			5.11***	.50				
Asian ^a (Y= 1, N = 0)	2.80	2.38			1.80	2.27				
Black ^a (Y= 1, N = 0)	-13.13***	1.52			-9.38***	1.49				
Hispanic ^a (Y= 1, N = 0)	-2.69*	1.29			1.70	1.37				
Native American ^a (Y= 1, N = 0)	-4.22	3.59			-.20	2.36				
Multi ^a (Y= 1, N = 0)	-4.06	2.46			-2.88	2.39				
Early academic performance										
1 st time kindergarten****			10.05***	2.32	9.59***	2.40	9.60***	2.43	9.07***	2.49
Reading assessment			.03	.05	.01	.05	.04	.05	.02	.05
Combination ARS			5.40***	.62	5.16***	.53	4.94***	.65	5.12***	.64
Math assessment			1.13***	.06	.90***	.06	1.11***	.06	1.11***	.06
Early resiliency behavior (bx)										
Early school-related emotional adaptation							3.47*	1.65		
Prosocial bx (parent- reported)							-.16	.98		
Prosocial bx (teacher- reported)							1.14	.65		
Early risk behavior (bx)										
Int bx (parent-reported)									-.64	1.17
Int bx (teacher-reported)									-.76	.85
Ext bx (parent-reported)									-1.86**	.64
Ext bx (teacher-reported)									-1.54*	.65
F Value	115.02***		180.87***		98.66***		116.05***		110.92**	*
R ²	.23		.36		.43		.36		.37	
ΔR^2			.13		.07		-.07		.01	

Note. *p < .05. **p < .01. *** < .001.

Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table E2

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Math Achievement Score Demographics and Early Resiliency Behavior Variations (N = 5,522-6,472)

Predictor	Model 1: Demographics (N = 6,472)		Model 6: Early Prosocial (N = 6,090)		Model 7: Demographics and Early Resiliency Behavior (N = 6,090)		Model 4: Early Resiliency Behavior and Early Academics (N = 5,522)		Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 5,939)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	142.42	.76	92.54	6.11	106.68	5.16	70.81	5.82	117.09	8.35
Control										
Demographics										
Gender (1 = M; 0 = F)	.91	.77			2.30**	.76				
SES composite	10.59	.58			10.02***	.62				
Asian ^a (Y= 1, N = 0)	2.80	2.38			3.03	2.51				
Black ^a (Y= 1, N = 0)	-13.13***	1.52			-12.61***	1.64				
Hispanic ^a (Y= 1, N = 0)	-2.69*	1.29			-2.74*	1.30				
Native American ^a (Y= 1, N = 0)	-4.22	3.59			-3.32	3.08				
Multi ^a (Y= 1, N = 0)	-4.06	2.46			-3.32	2.63				
Early Academic Performance										
1 st Time Kindergarten****							9.60***	2.43		
Reading Assmt							.04	.05		
Combo ARS							4.94***	.65		
Math Assmt							1.11***	.06		
Early resiliency behavior (bx)										
Early school-related emotional adaptation			6.10**	2.06	6.31**	1.81	3.47*	1.65	4.73*	2.13
Prosocial bx (parent-reported)			3.03**	1.15	1.09	.99	-.16	.98	3.32**	1.27
Prosocial bx (teacher-reported)			7.07***	.73	4.60***	.71	1.14	.65	4.66***	1.01
Early risk behavior (bx)										
Int bx (parent-reported)									.75	1.55
Int bx (teacher-reported)									-3.91***	1.02
Ext bx (Parent-reported)									-4.24***	.77
Ext bx (teacher-reported)									-.85	1.17
F Value	115.02***		45.74***		71.19***		116.05***		28.06***	
R ²	.23		.06		.26		.36		.09	
Δ R ²			-.17		.20		.10		-.27	

Note. *p < .05. **p < .01. *** <.001.

Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table E3

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Math Achievement Score Demographics and Externalizing Behavior Variations (N = 5,939-6,472)

Predictor	Model 1: Demographics (N = 6,472)		Model 9: Early risk behavior (N = 6,163)		Model 10: Demographics and early risk behavior (N = 6,163)		Model 5: Early academics and early risk behavior (N = 5,574)		Model 8: Early resiliency behavior and early risk behavior (N = 5,939)	
	B	SE B	B	B	B	SE B	B	SE B	B	SE B
Intercept	142.42	.76	165.36	2.82	160.37	2.63	92.24	4.93	117.09	8.35
Control										
Demographics										
Gender (1 = M; 0 = F)	.91	.77			1.88*	.80				
SES composite	10.59	.58			9.98***	.70				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	2.80	2.38			2.01	2.72				
Black ^a (Y= 1, N = 0)	-13.13***	1.52			-	1.61				
Hispanic ^a (Y= 1, N = 0)	-2.69*	1.29			12.73***	1.29				
Native American ^a (Y= 1, N = 0)	-4.22	3.59			-3.65	3.42				
Multi ^a (Y= 1, N = 0)	-4.06	2.46			-2.45	2.51				
Early academic performance										
1 st time kindergarten****							9.07***	2.49		
Reading Assmt							.02	.05		
Combo ARS							5.12***	.64		
Math Assmt							1.11***	.06		
Early resiliency Behavior (bx)										
Early school-related emotional adaptation									4.73*	2.13
Prosocial bx (Parent-Reported)									3.32**	1.27
Prosocial bx (teacher-reported)									4.66***	1.01
Early risk behavior (bx)										
Int bx (parent-reported)			-1.07	1.49	-2.52*	1.24	-.64	1.17	.75	1.55
Int bx (teacher-reported)			-5.49***	.95	-4.44***	.78	-.76	.85	-3.91***	1.02
Ext bx (parent-reported)			-4.57***	.77	-1.71**	.64	-1.86**	.64	-4.24***	.77
Ext bx (teacher-reported)			-3.49***	.92	-2.73**	.84	-1.54*	.65	-.85	1.17
F Value	115.02***		37.77***		73.70***		110.92***		28.06***	
R ²	.23		.06		.26		.37		.09	
Δ R ²			-.17		.20		.11		-.28	

Note. *p < .05. **p < .01. *** < .001.

Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table E4

Summary of Multiple Regression Analysis for Variables Predicting Academic Performance: Eighth Grade Math Achievement Score of Final and Non-Significant Interactions (N = 5,397)

Predictor	Model 11: All main effects (N = 5,397)		Model 12: Interaction of parent-reported impulsivity x gender: <i>N.S.</i> (N = 5,397)		Model 13: Interaction of teacher- reported externalizing behavior x gender: <i>N.S.</i> (N = 5,397)	
	B	B	B	SE B	B	SE B
Intercept	92.25	6.68	92.87	6.53	93.41	6.52
Control						
Demographics						
Gender (1 = M; 0 = F)	2.59**	.81	1.61	2.52	1.01	2.37
SES composite	5.03***	.57	5.03***	.57	5.04***	.57
Race/ethnicity						
Asian ^a (Y= 1, N = 0)	1.35	2.37	1.33	2.38	1.30	2.39
Black ^a (Y= 1, N = 0)	-9.51***	1.48	-9.49***	1.47	-9.45***	1.46
Hispanic ^a (Y= 1, N = 0)	1.19	1.37	1.17	1.37	1.17	1.37
Native American ^a (Y= 1, N = 0)	-.23	2.20	-.24	2.20	-.22	2.20
Multi ^a (Y= 1, N = 0)	-2.43	2.48	-2.42	2.48	-2.42	2.48
Early academic performance						
1 st Time Kindergarten****	8.52***	2.54	8.53***	2.53	8.56***	2.52
Reading Assessment	-0.01	.05	-0.01	.05	-.01	.05
Combination ARS	4.94***	.58	4.95***	.59	4.94***	.59
Math Assessment	.89***	.06	.89***	.06	.89***	.06
Early Resiliency Behavior (bx)						
Early school-related emotional adaptation						
Prosocial bx (Parent-Reported)	3.60*	1.65	3.61*	1.65	3.62*	1.64
Prosocial bx (Teacher-Reported)	-.43	.98	-.45	.96	-.45	.97
Prosocial bx (Teacher-Reported)	-.72	.77	-.73	.77	-.77	.78
Early Risk Behavior (bx)						
Int bx (Parent-Reported)	-1.27	1.17	-1.27	1.17	-1.28	1.16
Int bx (Teacher-Reported)	-1.07	.74	-1.08	.74	-1.11	.72
Ext bx (Parent-Reported)	-.60	.59	-.90	.97	-.61	.58
Ext bx (Teacher-Reported)	-1.39	.87	-1.40	.88	-2.03	1.47
Interactions Block						
Gender x Ext bx (Parent-Reported)			.50	1.36	1.00	1.61
Gender x Ext bx (Teacher-Reported)						
F Value	73.88***		69.40***		71.52***	
R ²	.43		.43		.43	
Δ R ²	N/A		N/A		N/A	

Note. **p* < .05. ***p* < .01. *** <.001. **** Model 11 was the final model determined by significant variables, because neither one of tested interactions was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NPIMPUL = Not Significant in Model 12 and NGender*NT1EXTERN = Not Significant in Model 13) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix F: Eighth Grade GPA Tables

Table F1

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,831-6,540$)

Predictor	Model 1: Demographics ($N = 6,540$)			Model 2: Early Academics ($N = 5,831$)			Model 3 *** Demographics and Early Academics ($N = 5,831$)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	4.56	.27	N/A	1.21	.93	N/A	3.51	1.08	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	-1.13***	.31	.32				-1.16**	.38	.31
SES composite	.96***	.15	2.60				.65***	.19	1.92
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	.59	.58	1.81				2.02*	.98	7.58
Black ^a (Y= 1, N = 0)	.19	.48	1.21				.27	.49	1.31
Hispanic ^a (Y= 1, N = 0)	-.25	.24	.78				.31	.31	1.36
Native American ^a (Y= 1, N = 0)	1.27	.96	3.56				.86	.74	2.36
Multi ^a (Y= 1, N = 0)	1.43	.74	4.17				1.39	.74	4.00
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.01	.50	.99	-.45	.52	.64
Reading Assessment				.02	.02	1.03	-.01	.02	.99
Combination ARS				.03	.27	1.03	-.08	.27	.93
Math Assessment				.07*	.03	1.07	.07*	.03	1.07
F Value	14,410.3***			7,022.39***			5,701.71***		

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table F2

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,570-6,157$)

Predictor	Model 4: Early Academics and Early Resiliency Behavior ($N = 5,570$)			Model 5: Early Academics and Early Risk Behavior ($N = 5,617$)			Model 6: Early Resiliency Behavior ($N = 6,157$)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-1.43	1.74	N/A	2.24	1.96	N/A	.27	1.11	N/A
Control									
Demographics									
Gender (1= male; 0 = female)									
SES composite									
Race/ethnicity									
Asian ^a (Y= 1, N = 0)									
Black ^a (Y= 1, N = 0)									
Hispanic ^a (Y= 1, N = 0)									
Native American ^a (Y= 1, N = 0)									
Multi ^a (Y= 1, N = 0)									
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****	-.07	.51	.94	-.15	.47	.87			
Reading Assessment	.02	.02	1.03	.02	.03	1.02			
Combination ARS	-.12	.28	.89	-.04	.30	.96			
Math Assessment	.07*	.03	1.07	.07*	.03	1.07			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	.59*	.29	1.80				.43	.30	1.53
Prosocial bx (Parent-Reported)	.28	.28	1.33				.50*	.24	1.65
Prosocial bx (Teacher-Reported)	.23	.25	1.25				.19	.20	1.21
Early Risk Behavior (bx)									
Int bx (Parent-Reported)				.35	.39	1.42			
Int bx (Teacher-Reported)				.32	.39	1.38			
Ext bx (Parent-Reported)				-.51**	.19	.60			
Ext bx (Teacher-Reported)				-.28	.21	.76			
F Value	5,095.69***			5,583.18***			4,891.78***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table F3

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,570 - 6,157$)

Predictor	Model 7: Demographics and Early Resiliency Behavior ($N = 6,157$)			Model 4: Early Academics and Early Resiliency Behavior ($N = 5,570$)			Model 8: Early Prosocial and Early Risk Behavior ($N = 6,004$)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	2.92	1.57	N/A	-1.43	1.74	N/A	1.46	1.79	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	-1.13**	.37	.32						
SES composite	.96***	.19	2.61						
Asian ^a (Y= 1, N = 0)	.67	.60	1.96						
Black ^a (Y= 1, N = 0)	.18	.46	1.20						
Hispanic ^a (Y= 1, N = 0)	-.12	.26	.89						
Native American ^a (Y= 1, N = 0)	1.40	1.06	4.05						
Multi ^a (Y= 1, N = 0)	1.40	.74	4.07						
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.07	.51	.94			
Reading Assessment				.02	.02	1.03			
Combination ARS				-.12	.28	.89			
Math Assessment				.07*	.03	1.07			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	.27	.33	1.32	.59*	.29	1.80	.43	.32	1.54
Prosocial bx (Parent-Reported)	.33	.23	1.39	.28	.28	1.33	.59**	.22	1.80
Prosocial bx (Teacher-Reported)	-.08	.23	.92	.23	.25	1.25	-.15	.29	.86
Early Risk Behavior (bx)									
Int bx (Parent-Reported)							.77*	.35	2.16
Int bx (Teacher-Reported)							-.17	.30	.84
Ext bx (Parent-Reported)							-.49**	.15	.62
Ext bx (Teacher-Reported)							-.25	.25	.78
F Value	10,146.3***			5,095.69***			4,673.57***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table F4

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,617-6,225$)

Predictor	Model 9: Early Risk Behavior ($N = 6,225$)			Model 10: Demographics and Early Risk Behavior ($N = 6,225$)			Model 5: Early Academics and M.H. ($N = 5,617$)		
	B	SE B	B	B	B	Exp (β)	B	SE B	Exp (β)
Intercept	4.38	.72	N/A	4.70	.73	N/A	2.24	1.96	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				-1.06**	.36	.35			
SES composite				.97***	.18	2.64			
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				.47	.58	1.60			
Black ^a (Y= 1, N = 0)				.27	.45	1.32			
Hispanic ^a (Y= 1, N = 0)				-.28	.23	.75			
Native American ^a (Y= 1, N = 0)				1.25	1.00	3.49			
Multi ^a (Y= 1, N = 0)				1.49*	.75	4.43			
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****							-.15	.47	.87
Reading Assmt							.02	.03	1.02
Combo ARS							-.04	.30	.96
Math Assmt							.07*	.03	1.07
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)									
Prosocial bx (Teacher-Reported)									
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	.53	.38	1.70	.29	.33	1.33	.35	.39	1.42
Int bx (Teacher-Reported)	-.15	.27	.86	.09	.28	1.09	.32	.39	1.38
Ext bx (Parent-Reported) =	-.47**	.16	.62	-.31	.18	.73	-.51**	.19	.60
Ext bx (Teacher-Reported)	-.23	.19	.79	-.07	.21	.93	-.28	.21	.76
F Value	4,398.89***			9,508.25***			5,583.18***		

Note. * $p < .05$. ** $p < .01$. *** $< .001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table F5

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,444$)

Predictor	Model 8: Prosocial and Early Risk Behavior ($N = 6,004$)			Model 11: Main Effects ($N = 5,444$)			Model 12: Interaction of Parent-Reported Emotional Adjustment x Gender: <i>N.S.</i> ($N = 5,444$)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	1.46	1.79	N/A	1.44	2.52	N/A	.28	2.36	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				-1.05*	.43	.35	.54	1.60	N/A
SES composite				.60*	.24	1.82	.61*	.24	1.84
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				1.95	1.00	7.00	1.92	1.00	6.81
Black ^a (Y= 1, N = 0)				.34	.48	1.40	.35	.49	1.42
Hispanic ^a (Y= 1, N = 0)				.21	.32	1.24	.21	.32	1.23
Native American ^a (Y= 1, N = 0)				.77	.78	2.15	.79	.78	2.20
Multi ^a (Y= 1, N = 0)				1.43	.75	4.17	1.41	.75	4.08
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.54	.52	.58	-.55	.51	.58
Reading Assessment				-.01	.03	1.00	-.01	.03	1.00
Combination ARS				-.15	.29	.86	-.14	.28	.87
Math Assessment				.07*	.03	1.07	.07*	.03	1.07
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	.43	.32	1.54	.51	.33	1.67	.97	.54	N/A
Prosocial bx (Parent-Reported)	.59**	.22	1.80	.31	.29	1.37	.31	.29	1.36
Prosocial bx (Teacher-Reported)	-.15	.29	.86	-.07	.31	.93	-.08	.31	.93
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	.77*	.35	2.16	.43	.35	1.54	.42	.35	1.53
Int bx (Teacher-Reported)	-.17	.30	.84	.34	.40	1.41	.35	.40	1.42
Ext bx (Parent-Reported)	-.49**	.15	.62	-.39	.20	.68	-.39	.20	.68
Ext bx (Teacher-Reported)	-.25	.25	.78	-.17	.27	.84	-.18	.27	.83
Emotional Adjustment x Gender							-.59	.61	N/A
F Value	4,673.57***			4,248.49***			4,056.57***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table F6

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,444$)

Predictor	Model 13: Interaction of Parent-Reported Internalizing Bx x Gender <i>N.S.</i> ($N = 5,444$)			Model 14: Interaction of Teacher-Reported Internalizing x Gender <i>N.S.</i> ($N = 5,444$)		
	B	SE B	B	B	B	Exp (β)
Intercept	.68	2.84	N/A	2.60	2.46	N/A
Control						
Demographics						
Gender (1= male; 0 = female)	-.05	1.22	N/A	-2.36***	.84	N/A
SES composite	.60*	.24	1.81	.61*	.24	1.84
Race/ethnicity						
Asian ^a (Y= 1, N = 0)	1.94	1.00	6.96	1.96	1.00	7.13
Black ^a (Y= 1, N = 0)	.34	.48	1.40	.35	.47	1.42
Hispanic ^a (Y= 1, N = 0)	.20	.32	1.22	.21	.32	1.23
Native American ^a (Y= 1, N = 0)	.77	.79	2.15	.80	.78	2.23
Multi ^a (Y= 1, N = 0)	1.40	.75	4.06	1.41	.75	4.10
Early Academic Performance						
First-time Kindergarten (1= yes; 0 = no) *****	-.53	.51	.59	-.54	.51	.58
Reading Assessment	.01	.03	1.00	-.01	.03	1.00
Combination ARS	-.16	.29	.85	-.14	.29	.87
Math Assessment	.07*	.03	1.07	.07*	.03	1.07
Early Resiliency Behavior (bx)						
Early school-related emotional adaptation	.51	.34	1.66	.51	.33	1.66
Prosocial bx (Parent-Reported)	.31	.29	1.36	.30	.29	1.35
Prosocial bx (Teacher-Reported)	-.08	.31	.93	-.09	.31	.91
Early Risk Behavior (bx)						
Int bx (Parent-Reported)	.96	.56	N/A	.43	.36	1.54
Int bx (Teacher-Reported)	.34	.40	1.40	-.31	.45	N/A
Ext bx (Parent-Reported)	-.38	.21	.69	-.39	.20	.68
Ext bx (Teacher-Reported)	-.17	.28	.85	-.20	.26	.82
Parent-Reported Internalizing Bx x Gender	-.67	.73	N/A			
Teacher-Reported Internalizing Bx x Gender				.86	.56	N/A
Parent-Reported Externalizing Bx x Gender						
F Value	4,062.28***			4,134.93***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian. Model 15 is the final model with only main effects.

Table F7

Summary of Logistic Analysis for Variables Predicting Academic Performance: Eighth Grade GPA ($y \geq 2.00 = 1$ or $n < 2.00 = 0$; $N = 5,444$)

Model 15: Interaction of Teacher-Reported Externalizing Bx x Gender <i>N.S.</i> ($N = 5,444$)			
Predictor	B	SE <i>B</i>	B
Intercept	2.34	3.00	N/A
Control			
Demographics			
Gender (1= male; 0 = female)	-2.06	1.22	N/A
SES composite	.61*	.24	1.84
Race/ethnicity			
Asian ^a (Y= 1, N = 0)	1.95	1.00	7.05
Black ^a (Y= 1, N = 0)	.40	.49	1.50
Hispanic ^a (Y= 1, N = 0)	.21	.32	1.23
Native American ^a (Y= 1, N = 0)	.73	.79	2.08
Multi ^a (Y= 1, N = 0)	1.41	.75	4.10
Early Academic Performance			
First-time Kindergarten (1= yes; 0 = no) *****	-.50	.52	.61
Reading Assessment	-.01	.03	1.00
Combination ARS	-.17	.31	.85
Math Assessment	.07*	.03	1.08
Early Resiliency Behavior (bx)			
Early school-related emotional adaptation	.54	.35	1.72
Prosocial bx (Parent-Reported)	.28	.28	1.32
Prosocial bx (Teacher-Reported)	-.08	.33	.93
Early Risk Behavior (bx)			
Int bx (Parent-Reported)	.39	.37	1.48
Int bx (Teacher-Reported)	.33	.41	1.39
Ext bx (Parent-Reported)	-.38	.19	.69
Ext bx (Teacher-Reported)	-.62	.65	N/A
Parent-Reported Externalizing Bx x Gender			
Teacher-Reported Externalizing Bx x Gender	.57	.61	N/A
<i>F</i> Value	4,143.54***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix G: Retention as of Eighth Grade Tables

Table G1

Summary of Logistic Analysis for Variables Predicting Academic Performance: Retention as of Eighth Grade. (yes = 1 or no = 0; N = 6,008-6,749)

Predictor	Model 1: Demographics (N = 6,749)			Model 2: Early academics (N = 6,008)			Model 3 *** Demographics and early academics (N= 6,008)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-2.48	.14	N/A	3.52***	.73	N/A	2.72	.74	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	.73***	.16	2.07				.59***	.16	1.80
SES composite	-.72***	.11	.49				-.31*	.14	.73
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-.45	.35	.64				-.44	.42	.64
Black ^a (Y= 1, N = 0)	.49	.19	1.64				.02	.17	1.02
Hispanic ^a (Y= 1, N = 0)	-.44*	.19	.64				-1.09***	.26	.34
Native American ^a (Y= 1, N = 0)	-.07	.27	.94				-.46	.23	.63
Multi ^a (Y= 1, N = 0)	.06	.44	1.06				-.48	.45	.62
Early academic performance									
First-time kindergarten (1= yes; 0 = no) *****				.48	.64	1.61	.66	.63	1.93
Reading assessment				-.04*	.02	.96	-.03	.02	.97
Combination ARS				-.77***	.17	.46	-.69***	.18	.50
Math assessment				-.10***	.02	.91	-.10***	.02	.91
F Value	3,3015.8***			116,343***			48,527.9***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table G2

Summary of Logistic Analysis for Variables Predicting Academic Performance: Retention as of Eighth Grade. (yes = 1 or no = 0; N = 5,734-6,347)

Predictor	Model 4: Early academics and Early Resiliency Behavior (N = 5,734)			Model 5: Early academics and early risk behavior (N = 5,787)			Model 6: Early resiliency behavior (N = 6,347)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	4.87	1.06	N/A	.96	.90	N/A	2.44	.66	N/A
Control									
Demographics									
Gender (1= male; 0 = female)									
SES composite									
Race/ethnicity									
Asian ^a (Y= 1, N = 0)									
Black ^a (Y= 1, N = 0)									
Hispanic ^a (Y= 1, N = 0)									
Native American ^a (Y= 1, N = 0)									
Multi ^a (Y= 1, N = 0)									
Early academic performance									
First-time kindergarten (1= yes; 0 = no) *****	.47	.66	1.60	.79	.63	2.20			
Reading assessment	-.04	.02	.96	-.02	.02	.98			
Combination ARS	-.65***	.18	.52	-.65***	.18	.52			
Math assessment	-.09***	.02	.91	-.09***	.02	.91			
Early resiliency behavior (bx)									
Early school-related emotional adaptation	-.51*	.21	.60				-.62**	.19	.54
Prosocial bx (parent-reported)	.14	.19	1.15				-.13	.14	.88
Prosocial bx (teacher-reported)	-.31*	.13	.73				-.79***	.10	.45
Early risk Behavior (bx)									
Int bx (parent-Reported)				.08	.19	1.08			
Int bx (Teacher-Reported)				.16	.16	1.17			
Ext bx (parent-Reported)				.16	.12	1.17			
Ext bx (teacher-Reported)				.16	.15	1.17			
F Value	64,250.4***			48,366.0***			45,369.4***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table G3

Summary of Logistic Analysis for Variables Predicting Academic Performance: Retention as of Eighth Grade (yes = 1 or no = 0; N = 5,734-6,347)

Predictor	Model 7: Demographics and Early Resiliency Behavior (N = 6,347)			Model 4: Early Academics and Early Resiliency Behavior (N = 5,734)			Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 6,189)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	1.29	.68	N/A	4.87	1.06	N/A	.14	1.01	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	.58***	.17	1.78						
SES composite	-.61***	.10	.54						
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-.58	.41	.56						
Black ^a (Y= 1, N = 0)	.50**	.18	1.64						
Hispanic ^a (Y= 1, N = 0)	-.43*	.19	.65						
Native American ^a (Y= 1, N = 0)	-.08	.23	.92						
Multi ^a (Y= 1, N = 0)	-.03	.46	.98						
Early academic									
First-time Kindergarten (1= yes; 0 = no) *****				.47	.66	1.60			
Reading Assessment				-.04	.02	.96			
Combination ARS				-.65***	.18	.52			
Math Assessment				-.09***	.02	.91			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	-.62***	.18	.54	-.51*	.21	.60	-.51*	.21	.60
Prosocial bx (Parent-Reported)	-.09	.14	.92	.14	.19	1.15	-.15	.15	.86
Prosocial bx (Teacher-Reported)	-.58***	.10	.56	-.31*	.13	.73	-.53***	.13	.59
Early Risk Behavior (bx)									
Int bx (Parent-Reported)							-.07	.18	.93
Int bx (Teacher-Reported)							.29	.16	1.34
Ext bx (Parent-Reported)							.33**	.11	1.39
Ext bx (Teacher-Reported)							.16	.15	1.18
F Value	29,232.9***			64,250.4***			23,866.5***		

Note. **p* < .05. ***p* < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table G4

Summary of Logistic Analysis for Variables Predicting Academic Performance: Retention as of Eighth Grade (yes = 1 or no = 0; N= 5,787-6,423)

Predictor	Model 9: Early Risk Behavior (N = 6,423)			Model 10: Demographics and Early Risk Behavior (N = 6,423)			Model 5: Early Academics and Early Risk Behavior (N=5,787)		
	B	SE B	B	B	B	Exp (β)	B	SE B	Exp (β)
Intercept	- 4.32	.32	N/A	- 4.27	.34	N/A	.96	.90	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				.53**	.17	1.70			
SES composite				-.65***	.12	.52			
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				-.40	.38	.67			
Black ^a (Y= 1, N = 0)				.50*	.20	1.64			
Hispanic ^a (Y= 1, N = 0)				-.37	.19	.69			
Native American ^a (Y= 1, N = 0)				-.07	.26	.93			
Multi ^a (Y= 1, N = 0)				-.06	.44	.94			
Early academic performance									
First-time kindergarten (1= yes; 0 = no) *****							.79	.63	2.20
Reading assessment							-.02	.02	.98
Combination ARS							-.65***	.18	.52
Math assessment							-.09***	.02	.91
Early resiliency behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)									
Prosocial bx (teacher-reported)									
Early risk behavior (bx)									
Int bx (parent-reported)	.13	.17	1.14	.25	.17	1.28	.08	.19	1.08
Int bx (teacher-reported)	.46**	.14	1.58	.41**	.15	1.51	.16	.16	1.17
Ext bx (parent-reported)	.37***	.10	1.45	.20	.11	1.22	.16	.12	1.17
Ext bx (teacher-reported)	.40***	.12	1.50	.27*	.12	1.31	.16	.15	1.17
F Value	30,991.9***			25,463.8***			48,366.0***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table G5

Summary of Logistic Analysis for Variables Predicting Academic Performance: Retention as of Eighth Grade (yes = 1 or no = 0; N = 5,603-6,189)

Predictor	Model 8: Prosocial and Early Risk Behavior (N = 6,189)			Model 11: Main Effects (N = 5,603)			Model 12: Interaction of Parent-Reported Externalizing Bx x Gender (N = 5,603)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	.14	1.01	N/A	2.91	1.40	N/A	2.20	1.35	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				.50**	.18	1.64	1.40**	.48	N/A
SES composite				-.24	.15	.78	-.25	.15	.78
Race/Ethnicity									
Asian ^a (Y= 1, N = 0)				-.53	.50	.59	-.51	.49	.60
Black ^a (Y= 1, N = 0)				.09	.16	1.09	.06	.16	1.06
Hispanic ^a (Y= 1, N = 0)				-1.06***	.26	.35	-1.04***	.26	.35
Native American ^a (Y= 1, N = 0)				-.35	.26	.71	-.34	.26	.71
Multi ^a (Y= 1, N = 0)				-.59	.49	.55	-.59	.47	.55
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				.67	.64	1.95	.67	.66	1.96
Reading Assessment				-.03	.02	.97	-.03	.02	.97
Combination ARS				-.58**	.19	.56	-.58**	.19	.56
Math Assessment				-.10***	.02	.91	-.10***	.02	.91
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	-.51*	.21	.60	-.45*	.22	.64	-.46*	.22	.63
Prosocial bx (Parent-Reported)	-.15	.15	.86	.08	.20	1.08	.11	.19	1.13
Prosocial bx (Teacher-Reported)	-.53***	.13	.59	-.08	.16	.92	-.08	.16	.92
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	-.07	.18	.93	-.04	.20	.96	-.02	.20	.98
Int bx (Teacher-Reported)	.29	.16	1.34	.18	.18	1.19	.19	.18	1.21
Ext bx (Parent-Reported)	.33**	.11	1.39	.12	.13	1.13	.41*	.20	N/A
Ext bx (Teacher-Reported)	.16	.15	1.18	.09	.17	1.10	.09	.17	1.09
Parent-Reported Externalizing Bx x Gender							-.43*	.21	N/A
F Value	23,866.5***			27,635.0***			26,480.6***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix H: Suspension as of Eighth Grade Tables

Table H1

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade. (yes = 1 or no = 0; N = 5,828-6,648)

Predictor	Model 1: Demographics (N = 6,648)			Model 2: Early Academics (N = 5,917)			Model 3 *** Demographics and Early Academics (N = 5,917)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-2.61	.12	N/A	1.03	.43	N/A	-1.44	.49	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	1.24***	.12	3.47				1.26***	.13	3.52
SES composite	-.39***	.09	.68				-.40***	.09	.67
Race/Ethnicity									
Asian ^a (Y= 1, N = 0)	-1.23***	.30	.29				-1.19**	.36	.31
Black ^a (Y= 1, N = 0)	-.14	.16	.87				-.08	.17	.93
Hispanic ^a (Y= 1, N = 0)	1.07***	.15	2.92				.99***	.15	2.70
Native American ^a (Y= 1, N = 0)	.36	.40	1.43				.04	.45	1.05
Multi ^a (Y= 1, N = 0)	.58	.31	1.78				.27	.33	1.31
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.82**	.28	.44	-.51	.27	.60
Reading Assessment				-.03	.02	.97	-.01	.02	.99
Combination ARS				.04	.10	1.04	.14	.10	1.16
Math Assessment				-.03**	.01	.97	-.03*	.01	.97
F Value	53,001.7***			26,854.0***			35,823.3***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table H2

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade. (yes = 1 or no = 0; N= 5,648-6,253)

Predictor	Model 4: Early Academics and Prosocial Behavior (N = 5,648)			Model 5: Early Academics and Risk Behavior (N = 5,698)			Model 6: Early Resiliency Behavior (N = 6,253)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	2.19	.62	N/A	-2.06	.65	N/A	.36	.47	N/A
Control									
Demographics									
Gender (1= male; 0 = female)									
SES composite									
Race/ethnicity									
Asian ^a (Y= 1, N = 0)									
Black ^a (Y= 1, N = 0)									
Hispanic ^a (Y= 1, N = 0)									
Native American ^a (Y= 1, N = 0)									
Multi ^a (Y= 1, N = 0)									
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****									
Reading Assessment									
Combination ARS									
Math Assessment									
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)									
Prosocial bx (Teacher-Reported)									
Early Risk Behavior (bx)									
Int bx (Parent-Reported)									
Int bx (Teacher-Reported)									
Ext bx (Parent-Reported)									
Ext bx (Teacher-Reported)									
F Value	22,100.2***			33,025.6***			29,688.1***		

Note. *p < .05. **p < .01. *** <.001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table H3

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade. (yes = 1 or no = 0; N= 6,097-6,253)

Predictor	Model 7: Demographics and Early Prosocial (N = 6,253)			Model 4: Early Academics and Early Prosocial (N = 6,253)			Model 8: Early Prosocial and M.H. (N = 6,097)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-1.64	.60	N/A	2.19	.62	N/A	-3.60	.71	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	1.13***	.12	3.08						
SES composite	-.35***	.09	.71						
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-1.06***	.30	.35						
Black ^a (Y= 1, N = 0)	1.03***	.16	2.80						
Hispanic ^a (Y= 1, N = 0)	.01	.16	1.00						
Native American ^a (Y= 1, N = 0)	.33	.34	1.40						
Multi ^a (Y= 1, N = 0)	.57	.32	1.77						
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.73**	.27	.48			
Reading Assmt				-.03	.02	.97			
Combo ARS				.18	.12	1.20			
Math Assmt				-.03*	.01	.97			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	-.28	.17	.76	-.39*	.18	.68	-.18	.20	.83
Prosocial bx (Parent-Reported)	.30**	.11	1.35	.24*	.11	1.27	.20*	.10	1.23
Prosocial bx (Teacher-Reported)	-.40***	.12	.67	-.57***	.15	.57	-.11	.12	.90
Early Risk Behavior (bx)									
Int bx (Parent-Reported)							-.01	.19	1.00
Int bx (Teacher-Reported)							-.07	.13	.93
Ext bx (Parent-Reported)							.53***	.10	1.71
Ext bx (Teacher-Reported)							.65***	.11	1.91
F Value	35,530.2***			22,100.2***			33,923.8***		

Note. **p* < .05. ***p* < .01. *** <.001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table H4

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade (yes = 1 or no = 0; N= 5,698-6,326)

Predictor	Model 9: Early Risk Behavior (N = 6,326)			Model 10: Demographics and Early Risk Behavior (N = 6,326)			Model 5: Early Academics and Risk Behavior (N = 5,698)		
	B	SE B	B	B	B	Exp (β)	B	SE B	Exp (β)
Intercept	- 3.82	.34	N/A	- 4.30	.38	N/A	-2.06	.65	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				1.06***	.13	2.89			
SES composite				-.28**	.09	.76			
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				-1.04***	.31	.36			
Black ^a (Y= 1, N = 0)				.93***	.16	2.55			
Hispanic ^a (Y= 1, N = 0)				-.01	.15	.99			
Native American ^a (Y= 1, N = 0)				.22	.35	1.25			
Multi ^a (Y= 1, N = 0)				.45	.31	1.56			
Early academic									
First-time Kindergarten (1= yes; 0 = no) *****							-.61*	.26	.54
Reading Assmt							-.02	.02	.98
Combo ARS							.19	.11	1.21
Math Assmt							-.03**	.01	.97
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)									
Prosocial bx (Teacher-Reported)									
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	-.04	.18	.96	.13	.19	1.13	-.04	.19	.96
Int bx (Teacher-Reported)	-.03	.12	.97	-.05	.13	.95	-.10	.12	.91
Ext bx (Parent-Reported)	.56***	.10	1.75	.41***	.10	1.62	.52***	.11	1.68
Ext bx (Teacher-Reported)	.67***	.10	1.96	.48***	.11	1.62	.63***	.12	1.89
F Value	58,027.6***			39,888.4***			33,025.6***		

Note. *p < .05. **p < .01. *** <.001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table H5

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade (yes = 1 or no = 0; N = 5,519-6,097)

Predictor	Model 8: Prosocial and Early Risk Behavior (N = 6,097)			Model 11: Main Effects (N = 5,519)			Model 12: N.S. Interaction of Parent-Reported Externalizing Bx x Black (N = 5,519)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	- 3.60	.71	N/A	- 4.03	.96	N/A	- 4.09	.98	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				.98***	.14	2.67	.98***	.14	N/A
SES composite				-.36***	.10	.70	-.36***	.10	.70
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				-.85*	.37	.43	-.84*	.37	.43
Black ^a (Y= 1, N = 0)				.92***	.16	2.52	1.20*	.52	N/A
Hispanic ^a (Y= 1, N = 0)				.14	.16	1.15	.14	.16	1.15
Native American ^a (Y= 1, N = 0)				.14	.42	1.15	.14	.42	1.15
Multi ^a (Y= 1, N = 0)				.25	.37	1.29	.25	.37	1.29
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-.36	.25	.70	-.35	.25	.70
Reading Assessment				-.01	.01	.99	-.01	.01	.99
Combination ARS				.24*	.10	1.27	.23*	.10	1.27
Math K Assessment				-.02	.01	.98	-.02	.01	.98
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation				-.31	.21	.74	-.31	.21	.74
Prosocial bx (Parent-Reported)	.20*	.10	1.23	.32**	.12	1.38	.32**	.12	1.38
Prosocial bx (Teacher-Reported)	-.11	.12	.90	-.02	.14	.98	-.02	.14	.98
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	-.01	.19	1.00	.18	.20	1.20	.18	.20	1.20
Int bx (Teacher-Reported)	-.07	.13	.93	-.09	.13	.92	-.09	.13	.91
Ext bx (Parent-Reported)	.53***	.10	1.71	.37**	.11	1.44	.40***	.11	N/A
Ext bx (Teacher-Reported)	.65***	.11	1.91	.50***	.13	1.65	.50***	.13	1.65
Parent-Reported Externalizing Bx x Black							-.12	.22	N/A
F Value	33,923.8***			23,656.3***			22,443.2***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table H6

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Suspension as of Eighth Grade. (yes = 1 or no = 0; N = 5,519)

Predictor	Model 13: <i>N.S.</i> Interaction of Teacher-Reported Externalizing Bx x Black (N = 5,519)			Model 13: <i>N.S.</i> Interaction of Teacher-Reported Externalizing Bx x Black (N = 5,519)		
	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-4.04	.97	N/A	-3.94	.98	N/A
Control						
Demographics						
Gender (1= male; 0 = female)	.98***	.14	2.66	.90***	.16	N/A
SES composite	-.36***	.10	.70	-.37***	.10	.69
Race/ethnicity						
Asian ^a (Y= 1, N = 0)	-.85*	.37	.43	-.86**	.37	.43
Black ^a (Y= 1, N = 0)	.99	.50	N/A	.75*	.30	N/A
Hispanic ^a (Y= 1, N = 0)	.14	.16	1.15	.14	.16	1.15
Native American ^a (Y= 1, N = 0)	.14	.42	1.15	.13	.42	1.14
Multi ^a (Y= 1, N = 0)	.25	.37	1.29	.25	.36	1.28
Early						
Academic Performance						
First-Time Kindergarten (1= yes; 0 = no) *****	-.36	.25	.70	-.36	.25	.70
Reading Assessment	-.01	.01	.99	-.01	.01	.99
Combo ARS	.24*	.10	1.27	.24*	.10	1.27
Math Assessment	-.02	.01	.98	-.02	.01	.98
Early Resiliency Behavior (bx)						
Early school-related emotional adaptation	-.31	.21	.74	-.31	.21	.73
Prosocial bx (Parent-Reported)	.32**	.12	1.38	.32	.12	1.38
Prosocial bx (Teacher-Reported)	-.02	.14	.98	-.02	.14	.98
Early Risk Behavior (bx)						
Int bx (Parent-Reported)	.18	.20	1.20	.17	.20	1.19
Int bx (Teacher-Reported)	-.09	.13	.92	-.09	.13	.92
Ext bx (Parent-Reported)	.36**	.11	1.44	.17	.20	1.45
Ext bx (teacher-reported)	.51***	.13	N/A	.50***	.13	1.66
Parent-Reported Externalizing Bx x Gender				N/A	N/A	N/A
Teacher-Reported Externalizing Bx x Black	-.03	.25	N/A	.25	.34	N/A
F Value	22,413.5***			22,465.3***		

Note. * $p < .05$. ** $p < .01$. *** $<.001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year. Please note each interaction, black x externalizing behavior (Parent-Reported), black x externalizing behavior (teacher-reported), gender x externalizing behavior (parent-reported), gender x externalizing (teacher-reported) was entered one at a time and deleted for each step if it was found to be insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix I: Eighth Grade Educational/Mental Health Diagnosis Tables

Table I1

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Parent-Reported Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; N = 5,924-6,651)

Predictor	Model 1: Demographics (N = 6,651)			Model 2: Early Academics (N = 5,924)			Model 3 *** Demographics and Early Academics (N = 5,924)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-1.68	.09	N/A	2.75	.42	N/A	2.83	.47	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	.60***	.11	1.82				.52***	.11	1.68
SES composite	-.25**	.07	.78				.10	.09	1.10
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-1.22***	.34	.29				-1.30**	.42	.27
Black ^a (Y= 1, N = 0)	-.26	.20	.77				-.51*	.22	.60
Hispanic ^a (Y= 1, N = 0)	-.47**	.15	.63				-.57**	.19	.57
Native American ^a (Y= 1, N = 0)	-.31	.26	.73				-.74**	.25	.48
Multi ^a (Y= 1, N = 0)	.29	.32	1.34				.03	.33	1.03
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-1.21***	.29	.30	-1.18***	.30	.31
Reading Assessment				-.02	.01	.98	-.02	.01	.99
Combination ARS				-.47***	.07	.63	-.44***	.08	.65
Math Assessment				-.03**	.01	.97	-.05***	.01	.95
F Value	12,858.3***			58,902.7***			27,924.3***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table I2

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Parent-Reported Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; N = 5,656- 6,259)

Predictor	Model 4: Early Academics and Early Resiliency Behavior (N = 5,656)			Model 5: Early Academics and Early Risk Behavior (N = 5,710)			Model 6: Early Resiliency Behavior (N = 6,259)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	4.96	.65	N/A	-.91	.62	N/A	2.40	.46	N/A
Control									
Demographics									
Gender (1= male; 0 = female)									
SES composite									
Race/ethnicity									
Asian ^a (Y= 1, N = 0)									
Black ^a (Y= 1, N = 0)									
Hispanic ^a (Y= 1, N = 0)									
Native American ^a (Y= 1, N = 0)									
Multi ^a (Y= 1, N = 0)									
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****	-1.14***	.30	.32	-1.03***	.27	.36			
Reading Assessment									
Combination ARS	-.34***	.08	.71	-.36***	.08	.70			
Math Assessment	-.03*	.01	.97	-.03*	.01	.97			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	-.51**	.17	.60				-.60***	.16	.55
Prosocial bx (Parent-Reported)	-.05	.11	.96				-.08	.10	.92
Prosocial bx (Teacher-Reported)	-.44***	.11	.65				-.70***	.10	.50
Early Risk Behavior (bx)									
Int bx (Parent-Reported)				.49***	.14	1.63			
Int bx (Teacher-Reported)				.14	.12	1.15			
Ext bx (Parent-Reported)				.36***	.10	1.43			
Ext bx (Teacher-Reported)				.54***	.09	1.71			
F Value	38,576.9***			45,137.9***			46,762.7***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table I3

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Parent-Reported Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; N = 5,656-6,259)

Predictor	Model 7: Demographics and Early Resiliency Behavior (N = 6,259)			Model 4: Early Academics and Early Resiliency Behavior (N = 5,656)			Model 8: Early Resiliency Behavior and Risk Behavior (N = 6,105)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	2.12	.46	N/A	4.96	.65	N/A	-2.52	.85	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	.47***	.11	1.60						
SES composite	-.17*	.09	.84						
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-1.29***	.38	.28						
Black ^a (Y= 1, N = 0)	-.36	.22	.70						
Hispanic ^a (Y= 1, N = 0)	-.50**	.17	.61						
Native American ^a (Y= 1, N = 0)	-.45*	.21	.64						
Multi ^a (Y= 1, N = 0)	.28	.28	1.32						
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****				-1.14***	.30	.32			
Reading Assmt Combo ARS				-.02	.01	.98			
Math Assmt				-.03*	.01	.97			
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation	-.55***	.15	.58	-.51**	.17	.60	-.44**	.17	.65
Prosocial bx (Parent-Reported)	-.13	.10	.88	-.05	.11	.96	-.04	.10	.96
Prosocial bx (Teacher-Reported)	-.63***	.09	.53	-.44***	.11	.65	-.17	.12	.84
Early Risk Behavior (bx)									
Int bx (Parent-Reported)							.38**	.15	1.46
Int bx (Teacher-Reported)							.17	.12	1.19
Ext bx (Parent-Reported)							.46***	.09	1.59
Ext bx (Teacher-Reported)							.57***	.10	1.77
F Value	19,934.5***			38,576.9***			41,138.0***		

Note. **p* < .05. ***p* < .01. *** <.001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table I4

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Parent-Reported Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; N = 5,710-6,355)

Predictor	Model 9: Early Risk Behavior (N = 6,335)			Model 10: Demographics and Early Risk Behavior (N = 6,335)			Model 5: Early Academics and Early Risk Behavior (N = 5,710)		
	B	SE B	B	B	B	Exp (β)	B	SE B	Exp (β)
Intercept	- 4.74	.31	N/A	- 4.66	.32	N/A	- .91	.62	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				.36**	.11	1.43			
SES composite				-.13	.08	.88			
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				-1.22**	.41	.30			
Black ^a (Y= 1, N = 0)				-.48*	.20	.62			
Hispanic ^a (Y= 1, N = 0)				-.33*	.17	.71			
Native American ^a (Y= 1, N = 0)				-.54**	.21	.58			
Multi ^a (Y= 1, N = 0)				.12	.26	1.12			
Early academic performance									
First-time Kindergarten (1= yes; 0 = no) *****							-1.03***	.27	.36
Reading Assessment Combination ARS							-.01	.01	.99
Math Assessment							-.36***	.08	.70
Early Resiliency Behavior (bx)							-.03*	.01	.97
Early school-related emotional adaptation									
Prosocial bx (Parent- Reported)									
Prosocial bx (Teacher-Reported)									
Early Risk Behavior (bx)									
Int bx (Parent- Reported)	.46***	.13	1.59	.48***	.13	1.62	.49***	.14	1.63
Int bx (Teacher- Reported)	.26*	.11	1.29	.23*	.10	1.26	.14	.12	1.15
Ext bx (Parent- Reported)	.47***	.08	1.60	.44***	.09	1.56	.36***	.10	1.43
Ext bx (Teacher- Reported)	.64***	.08	1.90	.61***	.08	1.84	.54***	.09	1.71
F Value	67,741.4***			28,434.8***			45,137.9***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year
^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table I5

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Eighth Grade Educational/Mental Health Diagnosis (yes = 1 or no = 0; N = 5,529-6,105)

Predictor	Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 6,105)			Model 11: Final Model with Main Effects (N = 5,529)			Model 12: Interaction of Parent-Reported Externalizing Bx x Gender N.S. (N = 5,529)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	-2.52	.85	N/A	.58	1.00	N/A	.80	1.09	N/A
Control									
Demographics									
Gender (1= male; 0 = female)				.31*	.13	1.37	.01	.35	N/A
SES composite				.16	.09	1.18	.17	.09	1.18
Race/ethnicity									
Asian ^a (Y= 1, N = 0)				-1.20*	.47	.30	-1.20*	.47	.30
Black ^a (Y= 1, N = 0)				-.73**	.24	.48	-.72**	.24	.49
Hispanic ^a (Y= 1, N = 0)				-.52*	.21	.59	-.53*	.21	.59
Native American ^a (Y= 1, N = 0)				-.75**	.28	.47	-.75**	.28	.47
Multi ^a (Y= 1, N = 0)				.02	.29	1.02	.02	.28	1.02
Early academic performance									
First-time Kindergarten (1= yes; 0 = no) *****				-1.04***	.29	.35	-1.04***	.29	.35
Reading Assessment				-.01	.01	.99	-.01	.01	.99
Combination ARS				-.34***	.09	.71	-.34***	.09	.71
Math Assessment				-.05***	.01	.96	-.04***	.01	.96
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)	-.44**	.17	.65	-.29	.19	.75	-.29	.19	.75
Prosocial bx (Teacher-Reported)	-.04	.10	.96	-.11	.11	.90	-.12	.11	.89
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	.38**	.15	1.46	.42**	.14	1.52	.42**	.15	1.52
Int bx (Teacher-Reported)	.17	.12	1.19	.06	.14	1.07	.06	.14	1.06
Ext bx (Parent-Reported)	.46***	.09	1.59	.38***	.10	1.46	.28*	.14	N/A
Ext bx (Teacher-Reported)	.57***	.10	1.77	.60***	.12	1.83	.60***	.12	1.83
Parent-Reported Externalizing Bx x Gender							.15	.17	N/A
F Value	41,138.0***			23,387.7***			22,206.9***		

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table I6

Summary of Logistic Analysis for Variables Predicting Behavioral Adjustment: Eighth Grade Educational/Mental Health Diagnosis (y = 1 or n = 0; N = 5,529)

Predictor	Model 13: Interaction of Teacher-Reported Externalizing Bx x Gender <i>N.S.</i> (N = 5,529)			Model 14: Interaction of Parent-Reported Internalizing Bx x Gender <i>N.S.</i> (N = 5,529)			Model 15: Interaction of Teacher-Reported Internalizing Bx x Gender (N = 5,529)		
	B	SE B	Exp (β)	B	SE B	Exp (β)	B	SE B	Exp (β)
Intercept	.71	1.12	N/A	.59	1.04	N/A	.40	.95	N/A
Control									
Demographics									
Gender (1= male; 0 = female)	.16	.31	N/A	.30	.52	N/A	.55	.40	N/A
SES composite	.17	.09	1.18	.16	.09	1.18	.16	.09	1.18
Race/ethnicity									
Asian ^a (Y= 1, N = 0)	-1.20*	.46	.30	-1.20*	.47	.30	-1.20*	.47	.30
Black ^a (Y= 1, N = 0)	-.72**	.24	.49	-.73**	.24	.48	-.73**	.24	.48
Hispanic ^a (Y= 1, N = 0)	-.53*	.21	.59	-.52*	.21	.59	-.52*	.21	.59
Native American ^a (Y= 1, N = 0)	-.75**	.28	.47	-.75**	.28	.47	-.76**	.28	.47
Multi ^a (Y= 1, N = 0)	.02	.29	1.02	.02	.28	1.02	.02	.28	1.02
Early Academic Performance									
First-time Kindergarten (1= yes; 0 = no) *****	-1.04***	.29	.35	-1.05***	.29	.35	-1.04***	.29	.35
Reading Assessment									
Combo ARS	-.34***	.09	.71	-.34***	.09	.71	-.34***	.09	.71
Math Assessment	-.05***	.01	.96	-.05***	.01	.96	-.05***	.01	.96
Early Resiliency Behavior (bx)									
Early school-related emotional adaptation									
Prosocial bx (Parent-Reported)	-.11	.11	.89	-.11	.11	.90	-.11	.11	.90
Prosocial bx (Teacher-Reported)	.04	.13	1.04	.05	.13	1.05	.05	.13	1.05
Early Risk Behavior (bx)									
Int bx (Parent-Reported)	.42**	.15	1.52	.42	.23	N/A	.42**	.14	1.52
Int Bx (Teacher-Reported)	.06	.14	1.06	.06	.14	1.07	.16	.16	N/A
Ext Bx (Parent-Reported)	.38***	.10	1.46	.38***	.10	1.46	.38***	.10	1.46
Ext bx (Teacher-Reported)	.54**	.19	N/A	.60***	.12	1.83	.61***	.12	1.84
Parent-Reported Externalizing Bx x Gender									
Teacher-Reported Externalizing Bx x Gender	.09	.19	N/A						

Table I6 (Continued)

Predictor	Model 13: Interaction of Teacher-Reported Externalizing Bx x Gender <i>N.S.</i> (<i>N</i> = 5,529)			Model 14: Interaction of Parent-Reported Internalizing Bx x Gender <i>N.S.</i> (<i>N</i> = 5,529)			Model 15: Interaction of Teacher-Reported Internalizing Bx x Gender (<i>N</i> = 5,529)		
	B	SE <i>B</i>	Exp (β)	B	SE <i>B</i>	Exp (β)	B	SE <i>B</i>	Exp (β)
Parent-Reported Internalizing Bx x Gender				.01	.33	N/A			
Teacher-Reported Internalizing Bx x Gender							-.15	.25	N/A
<i>F</i> Value	22,172.4***			22,156.8***			22,182.9***		

Note. **p* < .05. ***p* < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix J: Eighth Grade Internalizing Problems Tables

Table J1

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Internalizing Problems in Eighth Grade (N = 5,919-6,642)

Predictor	Model 1: Demographics (N = 6,642)		Model 2: Early Academics (N = 5,919)		Model 3: Demographics and Early Academics (N = 5,919)		Model 4: Early Academics and Early Resiliency Behavior (N = 5,652)		Model 5: Early Academics and Risk Behavior **** (N = 5,705)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	1.31	.01	1.67	.05	1.70	.05	2.12	.07	1.18	.07
Control										
Demographics										
Gender (1 = M; 0 = F)	.01	.01			.01	.01				
SES composite	-.04***	.01			-.02**	.01				
Asian ^a (Y= 1, N = 0)	-.09***	.03			-.07	.04				
Black ^a (Y= 1, N = 0)	-.05**	.02			-.07***	.02				
Hispanic ^a (Y= 1, N = 0)	-.03	.02			-.04*	.02				
Native American ^a (Y= 1, N = 0)	-.05*	.02			-.08***	.02				
Multi ^a (Y= 1, N = 0)	-.05	.04			-.09**	.04				
Early academic performance										
1 st Time Kindergarten****			-.17***	.04	-.17***	.04	-.16***	.05	-.15***	.04
Reading Assessment			-.01	.01	-.01	.01	-.01	.01	-.01	.01
Combo ARS			-.03**	.01	-.03**	.01	-.02	.01	-.01	.01
Math Assessment			-.01**	.01	-.01**	.01	-.01*	.01	-.01**	.01
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation							-.10***	.02		
Prosocial bx (Parent-Reported)							-.04**	.01		
Prosocial bx (Teacher-Reported)							-.04***	.01		
Early Risk Behavior (bx)										
Int bx (Parent-Reported)									.14***	.02
Int bx (Teacher-Reported)									.04*	.02
Ext bx (Parent-Reported)									.04**	.01
Ext bx (Teacher-Reported)									.02	.01
F Value	7.00***		32.38***		17.17***		28.86***		39.22***	
R ²	.01		.04		.05		.07		.10	
Δ R ²			.03		.01		.02		.03	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table J2

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Internalizing Problems in Eighth Grade (N = 5,662-6,642)

Predictor	Model 1: Demographics (N = 6,642)		Model 6: Early Prosocial Bx (N = 6,252)		Model 7: Demographics and Early Resiliency Behavior (N = 6,252)		Model 4: Early Resiliency Behavior and Early Academics (N = 5,652)		Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 6,098)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	1.31	.01	1.90	.06	1.93	.06	2.12	.07	1.32	.10
Control										
Demographics										
Gender (1 = M; 0 = F)	.01	.01			-.02	.01				
SES composite	-.04***	.01			-.03***	.01				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	-.09***	.03			-.10***	.03				
Black ^a (Y= 1, N = 0)	-.05**	.02			-.06**	.02				
Hispanic ^a (Y= 1, N = 0)	-.03	.02			-.03	.01				
Native American ^a (Y= 1, N = 0)	-.05*	.02			-.07**	.02				
Multi ^a (Y= 1, N = 0)	-.05	.04			-.06	.04				
Early Academic Performance										
1 st Time Kindergarten*****							-.16***	.05		
Reading Assmt							-.01	.01		
Combo ARS							-.02	.01		
Math Assmt							-.01*	.01		
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation			-.12***	.02	-.11***	.02	-.10***	.02	-.08***	.02
Prosocial bx (Parent-Reported)			-.03**	.01	-.04***	.01	-.04**	.01	-.02*	.02
Prosocial bx (Teacher-Reported)			-.06***	.01	-.06***	.01	-.04***	.01	-.03*	.01
Early Risk Behavior (bx)										
Int bx (Parent-Reported)									.13***	.02
Int bx (Teacher-Reported)									.02	.02
Ext bx (Parent-Reported)									.04***	.01
Ext bx (Teacher-Reported)									.02	.02
F Value	7.00***		35.20***		18.17***		28.86***		34.68***	
R ²	.01		.04		.05		.07		.09	
Δ R ²			.03		.01		.02		.02	

Note. *p < .05. **p < .01. *** < .001. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table J3

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Internalizing Problems in Eighth Grade (N = 5,705-6,326)

Predictor	Model 1: Demographics (N = 6,098)		Model 9: Early Risk Behavior (N = 6,326)		Model 10: Demographics and Early Risk Behavior (N = 6,326)		Model 5: Early Academics and Early Risk Behavior (N = 5,705)		Model 8: Prosocial and Early Risk Behavior (N = 6,098)	
	B	SE B	B	B	B	SE B	B	SE B	B	SE B
Intercept	1.31	.01	.85	.03	.87	.03	1.18	.07	1.32	.10
Control										
Demographics										
Gender (1 = M; 0 = F)	.01	.01			-.01	.01				
SES composite	-.04***	.01			-.03**	.01				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	-.09***	.03			-.08**	.03				
Black ^a (Y= 1, N = 0)	-.05**	.02			-.06**	.02				
Hispanic ^a (Y= 1, N = 0)	-.03	.02			-.01	.02				
Native American ^a (Y= 1, N = 0)	-.05*	.02			-.07**	.02				
Multi ^a (Y= 1, N = 0)	-.05	.04			-.07*	.03				
Early Academic Performance										
1 st Time Kindergarten*****							-.15***	.04		
Reading Assmt							-.01	.01		
Combo ARS							-.01	.01		
Math Assmt							-.01**	.01		
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation									-.08***	.02
Prosocial bx (Parent-Reported)									-.02*	.02
Prosocial bx (Teacher-Reported)									-.03*	.01
Early Risk Behavior (bx)										
Int bx (Parent-Reported)			.14***	.02	.15***	.02	.14***	.02	.13***	.02
Int bx (Teacher-Reported)			.05**	.02	.04**	.02	.04*	.02	.02	.02
Ext bx (Parent-Reported)			.05***	.01	.04***	.01	.04**	.01	.04***	.01
Ext bx (Teacher-Reported)			.03*	.01	.04**	.01	.02	.01	.02	.02
F Value	7.00***		41.90***		20.29***		39.22***		34.68***	
R ²	.01		.07		.08		.10		.09	
Δ R ²			.06		.01		.02		-.01	

Note. *p < .05. **p < .01. *** <.001. **** Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table J4

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Internalizing Problems in Eighth Grade of Final and Non-Significant Interactions (N = 5,525)

Predictor	Model 11: All Main Effects (N = 5,525)		Model 12: N.S. Interaction of Parent Rated Impulsivity x Gender (N = 5,525)		Model 13: N.S. Interaction of Teacher-Reported Externalizing Bx x Gender (N = 5,525)	
	B	B	B	SE B	B	SE B
Intercept	1.59	.11	1.58	.11	1.64	.10
Control						
Demographics						
Gender (1 = M; 0 = F)	-.02	.01	-.01	.04	-.08	.01
SES composite	-.01	.01	-.01	.01	-.01	.01
Race/ethnicity						
Asian ^a (Y= 1, N = 0)	-.07*	.03	-.07*	.03	-.07*	.03
Black ^a (Y= 1, N = 0)	-.08***	.02	-.08***	.02	-.08***	.02
Hispanic ^a (Y= 1, N = 0)	-.03	.02	-.03	.02	-.03	.02
Native American ^a (Y= 1, N = 0)	-.09***	.02	-.09***	.02	-.10***	.02
Multi ^a (Y= 1, N = 0)	-.10**	.03	-.10**	.03	-.10**	.03
Early academic performance						
1 st Time	-.16***	.04	-.16***	.04	-.16***	.04
Kindergarten****						
Reading Assmt	-.01	.01	-.01	.01	-.01	.01
Combo ARS	-.01	.01	-.01	.01	-.01	.01
Math Assmt	-.01*	.01	-.01	.01	-.01*	.01
Early Resiliency Behavior (bx)						
Early school-related emotional adaptation	-.06**	.02	-.06***	.02	-.06**	.02
Prosocial bx (Parent- Reported)	-.03*	.01	-.03*	.01	-.03**	.01
Prosocial bx (Teacher- Reported)	-.02	.01	-.02	.01	-.02	.01
Early Risk Behavior (bx)						
Int bx (Parent-Reported)	.12***	.02	.12***	.02	.12***	.02
Int bx (Teacher-Reported)	.02	.02	.02	.02	.02	.02
Ext bx (Parent-Reported)	.04**	.01	.04*	.02	.04**	.01
Ext bx (Teacher- Reported)	.02	.02	.02	.02	-.01	.02
Interactions Block						
Gender x Ext bx (Parent- Reported)			-.01	.02		
Gender x Ext bx (Teacher- Reported)					.04	.03
F Value	31.69***		30.79***		30.75***	
R ²	.12		.12		.12	
Δ R ²	.03		.00		.00	

Note. **p* < .05. ***p* < .01. *** < .001. **** Model 11 was the final model determined by significant variables, because of the tested interactions, neither was significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note each interaction (e.g., NGender x NP1IMPUL = Not Significant in Model 12 and NGender*NT1EXTERN = Not Significant in Model 13) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Appendix K: Eighth Grade Externalizing Problems Tables

Table K1

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Externalizing Problems in Eighth Grade (N = 5,562-6,641)

Predictor	Model 1: Demographics (N = 6,641)		Model 2: Early Academics (N = 5,919)		Model 3: Demographics and Early Academics (N = 5,919)		Model 4: Early Academics and Early Resiliency Behavior (N = 5,652)		Model 5: Early Academics and Risk Behavior **** (N = 5,705)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	1.32	.01	1.87	.06	1.72	.06	2.34	.09	1.09	.08
Control										
Demographics										
Gender (1 = M; 0 = F)	.13***	.01			.12***	.02				
SES composite	-.08***	.01			-.04***	.01				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	-.13***	.02			-.12***	.03				
Black ^a (Y= 1, N = 0)	.03	.02			.01	.02				
Hispanic ^a (Y= 1, N = 0)	-.08***	.02			-.08***	.02				
Native American ^a (Y= 1, N = 0)	-.09**	.03			-.13***	.03				
Multi ^a (Y= 1, N = 0)	.02	.05			-.02	.05				
Early Academic Performance										
1 st Time Kindergarten****			-.11*	.06	-.08	.05	-.09	.06	-.05	.04
Reading Assmt			-.01**	.01	-.01	.01	-.01*	.01	-.01	.01
Combo ARS			-.05***	.01	-.04***	.01	-.03*	.01	-.02*	.01
Math Assmt			-.01**	.01	-.01**	.01	-.01*	.01	-.01**	.01
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation							-.09***	.03		
Prosocial bx (Parent-Reported)							-.01	.01		
Prosocial bx (Teacher-Reported)							-.10***	.01		
Early Risk Behavior (bx)										
Int bx (Parent-Reported)									.06**	.02
Int bx (Teacher-Reported)									-.02	.02
Ext bx (Parent-Reported)									.14***	.01
Ext bx (Teacher-Reported)									.12***	.02
F Value	25.91***		42.68***		24.44***		30.36***		38.90***	
R ²	.08		.07		.12		.11		.23	
ΔR^2			-.01		.05		-.01		.12	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table K2

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Externalizing Problems in Eighth Grade (N = 6,098-6,641)

Predictor	Model 1: Demographics (N = 6,641)		Model 6: Early Prosocial (N = 6,252)		Model 7: Demographics and Early Resiliency Behavior (N = 6,252)		Model 4: Early Resiliency Behavior and Early Academics (N = 6,252)		Model 8: Early Resiliency Behavior and Early Risk Behavior (N = 6,098)	
	B	SE B	B	SE B	B	SE B	B	SE B	B	SE B
Intercept	1.32	.01	2.08	.08	1.94	.07	2.34	.09	1.16	.11
Control										
Demographics										
Gender (1 = M; 0 = F)	.13***	.01			.10***	.01				
SES composite	-.08***	.01			-.07***	.01				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	-.13***	.02			-.14***	.02				
Black ^a (Y= 1, N = 0)	.03	.02			.01	.02				
Hispanic ^a (Y= 1, N = 0)	-.08***	.02			-.08***	.02				
Native American ^a (Y= 1, N = 0)	-.09**	.03			-.10**	.03				
Multi ^a (Y= 1, N = 0)	.02	.05			.01	.05				
Early Academic Performance										
1 st Time Kindergarten****							-.09	.06		
Reading Assmt							-.01*	.01		
Combo ARS							-.03*	.01		
Math Assmt							-.01*	.01		
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation			-.10***	.02	-.09***	.02	-.09***	.03	-.07**	.02
Prosocial bx (Parent-Reported)			-.01	.01	-.01	.01	-.01	.01	-.02	.01
Prosocial bx (Teacher-Reported)			-.13***	.01	-.10***	.01	-.10***	.01	-.02*	.01
Early Risk Behavior (bx)										
Int bx (Parent-Reported)									.04*	.02
Int bx (Teacher-Reported)									-.01	.02
Ext bx (Parent-Reported)									.15***	.01
Ext bx (Teacher-Reported)									.12***	.02
F Value	25.91***		61.33***		36.50***		30.36***		49.84***	
R ²	.08		.07		.12		.11		.21	
Δ R ²			-.01		.05		-.01		.10	

Note. *p < .05. **p < .01. *** < .001. **** Bx = Behavior. ***** If first-time kindergarten student or if had retention prior to 1998-1999 school year.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table K3

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Externalizing Problems in Eighth Grade (N = 5,705-6,641)

Predictor	Model 1: Demographics (N = 6,641)		Model 9: Early Risk Behavior (N = 6,326)		Model 10: Demographics and Early Risk Behavior (N = 6,326)		Model 5: Early Academics and Early Risk Behavior (N = 5,705)		Model 8: Prosocial and Early Risk Behavior (N = 6,098)	
	B	SE B	B	B	B	SE B	B	SE B	B	SE B
Intercept	1.32	.01	.78	.04	.81	.04	1.09	.08	1.16	.11
Control										
Demographics										
Gender (1 = M; 0 = F)	.13***	.01			.07***	.01				
SES composite	-.08***	.01			-.05***	.01				
Race/ethnicity										
Asian ^a (Y= 1, N = 0)	-.13***	.02			-.11***	.02				
Black ^a (Y= 1, N = 0)	.03	.02			-.03	.02				
Hispanic ^a (Y= 1, N = 0)	-.08***	.02			-.05**	.02				
Native American ^a (Y= 1, N = 0)	-.09**	.03			-.10***	.03				
Multi ^a (Y= 1, N = 0)	.02	.05			-.02	.04				
Early Academic Performance										
1 st Time Kindergarten****							-.05	.04		
Reading Assmt							-.01	.01		
Combo ARS							-.02*	.01		
Math Assmt							-.01**	.01		
Early Resiliency Behavior (bx)										
Early school-related emotional adaptation									-.07**	.02
Prosocial bx (Parent-Reported)									-.02	.01
Prosocial bx (Teacher-Reported)									-.02*	.01
Early Risk Behavior (bx)										
Int bx (Parent-Reported)			.05**	.02	.06***	.02	.06**	.02	.04*	.02
Int bx (Teacher-Reported)			.01	.02	-.01	.02	-.02	.02	-.01	.02
Ext bx (Parent-Reported)			.15***	.01	.13***	.01	.14***	.01	.15***	.01
Ext bx (Teacher-Reported)			.13***	.01	.12***	.01	.12***	.02	.12***	.02
F Value	25.91***		80.28***		49.41***		38.90***		49.84***	
R ²	.08		.20		.23		.23		.21	
Δ R ²			.12		.03		.00		-.02	

Note. *p < .05. **p < .01. *** < .001.

Bx = Behavior. **** If first-time kindergarten student or if had retention prior to 1998-1999 school year

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.

Table K4

Summary of Multiple Regression Analysis for Variables Predicting Behavioral Adjustment: Externalizing Problems in Eighth Grade of Final and Non-Significant Interactions (N = 5,525)

Predictor	Model 11: All Main Effects (N = 5,525)		Model 12: Interaction of Gender x Socioeconomic Status: N.S. (N = 5,525)	
	B	B	B	SE B
Intercept	1.33	.13	1.33	.13
Control				
Demographics				
Gender (1 = M; 0 = F)	.06***	.02	.06***	.02
SES composite	-.03**	.01	-.02	.01
Asian ^a (Y= 1, N = 0)	-.11***	.03	-.11***	.02
Black ^a (Y= 1, N = 0)	-.04	.02	-.04	.02
Hispanic ^a (Y= 1, N = 0)	-.05**	.02	-.05**	.02
Native American ^a (Y= 1, N = 0)	-.14***	.02	-.14***	.02
Multi ^a (Y= 1, N = 0)	-.04	.04	-.04	.04
Early Academic Performance				
1 st Time	-.05	.05	-.04	.04
Kindergarten****				
Reading Assmt	-.01	.01	-.01	.01
Combo ARS	-.02	.01	-.02	.01
Math Assmt	-.01*	.01	-.01**	.01
Early Resiliency Behavior (bx)				
Early school-related emotional adaptation	-.06*	.02	-.06*	.02
Prosocial bx (Parent- Reported)	-.02	.01	-.02	.01
Prosocial bx (Teacher- Reported)	-.01	.01	-.01	.01
Early Risk Behavior (bx)				
Int bx (Parent-Reported)	.05**	.02	.05**	.02
Int bx (Teacher-Reported)	-.03	.02	-.03	.02
Ext bx (Parent-Reported)	.14***	.01	.14***	.01
Ext bx (Teacher-Reported)	.11***	.02	.11***	.02
Interaction Blocks				
Gender x SES			-.01	.02
F Value	35.06***		33.21***	
R ²	.26		.26	
ΔR^2	.05		0	

Note. **p* < .05. ***p* < .01. *** <.001. **** Model 11 was the final model determined by significant variables, because the tested interaction was not significant.

Bx = Behavior. *****If first-time kindergarten student or if had retention prior to 1998-1999 school year.

Please note the interaction (e.g., NGender x SES = Not Significant) was entered one at a time and deleted for each step because of being insignificant.

^a = when a racial/ethnic category is followed by a subscript it indicates that the comparison reference group is Caucasian.